CANOES OF OCEANIA

By
A. C. HADDON and JAMES HORNELL

VOLUME II
THE CANOES OF MELANESIA, QUEENSLAND, AND NEW GUINEA

By A. C. Haddon

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VOLUME II.

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INTRODUCTION[1]

In addition to the acknowledgments made in volume III, I would like to thank those friends who have given me the benefit of their local knowledge and have put notes, sketches, and photographs at my disposal. Without this assistance my information would be very imperfect for many areas in Melanesia, Queensland, and New Guinea.

In the early stages of this investigation I received continuous and ungrudging help from Miss E. S. Fegan of Girton College, especially with regard to the German and other foreign literature on the subject, for what is here published is only a fraction of that which she translated or abstracted for me. I owe a heavy debt to Miss A. Nicol Smith of Newnham College, who acted as my secretary and helped me in numerous ways in the later stages of the production of this memoir. Finally I desire to thank Miss E. T. Talbot for the skill and intelligent care she exercised in making the line drawings from photographs, sketches, and published illustrations. With regard to the published illustrations, I would point out that various slight modifications or omissions have been made in order to procure greater clarity and that such discrepancies from the originals as occur are not due to carelessness in copying.

NEW CALEDONIA, LOYALTY ISLANDS, AND ISLE OF PINES

INTRODUCTION

The New Caledonians were not great seafarers. The extent of their voyaging was limited to the Bélep Islands in the north, the Loyalty Islands in the east, and the Isle of Pines (Kunie) in the south. The Loyalty Islanders had a better reputation as sea folk.

The most complete account of the canoes of New Caledonia and the Loyalty Islands is the fine monograph by Sarasin (1929,pp. 84-90)[2], in which all previous writers on the subject are thoroughly documented. Of particular value also is the record of Lambert (1900), who arrived in 1856 at the Bélep Islands, the first white man to live there. I would like here to acknowledge the use I have made of the unpublished notes and drawings by my friend and former pupil, Paul Montague, who lost his life in action in 1918 and was in New Caledonia with R. H. Compton in 1914.

[1] In conformity with Museum editorial practice, the spellings of English words have been modified to American spellings as given in Webster's New International Dictionary.—Editor.

[2] Reference to the Bibliography (p. 335) is made by date of publication.

In New Caledonia there were two groups of craft, the single-outrigger canoe and the double canoe. All writers agree that the single-outrigger canoes and the double canoes of the Loyalty Islands were similar to those of New Caledonia. Little is on record concerning the canoes of the Isle of Pines.

OUTRIGGER CANOES

The simple outrigger canoes show a remarkable uniformity in all essentials, but Montague (MS. in possession of A. C. Haddon) recognized three types in New Caledonia: 1, the small dugouts with two booms which are used near the mouths of the larger rivers but are never seen inland above the first rapids, even though there may be long stretches of water above them; 2, large coastal canoes of the same general form, with three booms; 3, sea-going canoes with a wash-strake, platform, and three booms:

1. The river canoes are small; one was only 9 feet (2.745 meters) long. The ends of the hull are more or less punt-shaped and the sides fall in considerably. The two booms are lashed directly to the gunwale by a cord that passes through two holes through the edge of the hull. The float is about two thirds the length of the hull and is pointed at both ends, commonly with a slight sheer; it is flattened above and rounded below. The attachment consists of a pair of converging Y-shaped sticks. The stem of the Y is inserted into an almost vertical hole burned through the float, so that the subsequent bending in and lashing of the arms to the boom makes its withdrawal extremely difficult. This insures a safe and simple connection, and is one of the most practical methods of attachment possible. The craft is propelled by means of paddles or punted in shallow water with a long, light pole.

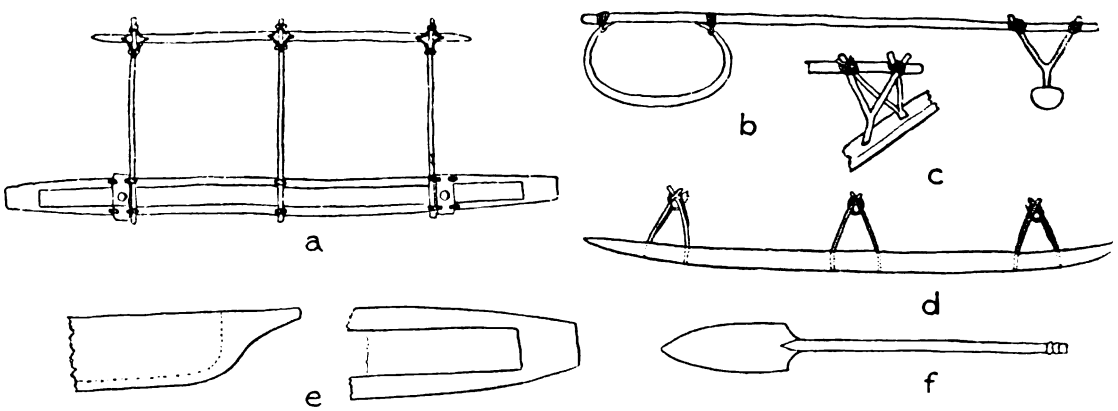

FIGURE 1.—Coastal canoes, New Caledonia: *a*, plan, showing steppings for mast; *b*, section with boom and connective; *c*, Y connective; *d*, float with connectives; *e*, side and upper surface of an end; *f*, paddle (drawn by Paul Montague, 1914).

2. The coastal canoe (fig. 1) is much larger and may be as much as 30 feet (9.15 meters) long. The best specimens, which come from the south of the island, are made from the trunks of the kauri pine, though several species of hard woods, known collectively as *up*, are more generally employed. The trees used for this purpose are confined to special districts in the mountain forests, many of them a long distance from the coast, and their cutting and transportation is an undertaking of great magnitude employing much time and many men. The log, when cut, is roughly shaped and hollowed on the spot. It is burned out with hot stones and the charcoal is chipped away with a small stone adz (*okono*). The log is then dragged down to the coast along special routes by means of ropes of twisted creepers, and there completed.

One coastal canoe seen by Montague near Yaté was 30 feet long and held 10 persons. The hull, which was by no means perfectly straight, was made from the stem of a medium-sized kauri. The three booms were tied to the gunwales and extended outboard about 8 feet. In contact with the outer edge of the inboard portion of each of the outer booms was a perforated

wooden thwart, through which the mast could be stepped; it was bound to the boom and the hull in the usual manner and it slightly overlapped the gunwales. The terms "stem" and "stern" are inapplicable, as the canoe may travel either way with the same facility. The attachments of the float to the booms are similar in all the canoes.

The sailing canoes observed by Montague agree in general features. The mat sails have for many years been replaced by sail cloth. The mast is about 9 or 10 feet high and is sometimes supported by a stay on each side. The sail is almost square with a light gaff and boom. The proximal end of the boom is attached to the lower portion of the mast by a loop of cord, and the throat of the gaff is simply hitched over the top of the mast, which tapers shortly to a point. The peak is held up by a bamboo sprit, which is generally held in the hand and has to be taken out and slipped in on the other side of the sheet when putting about. Though this method may appear clumsy, halyards are entirely dispensed with and the sail can be lowered in an emergency with great ease and certainty by simply dropping the peak.

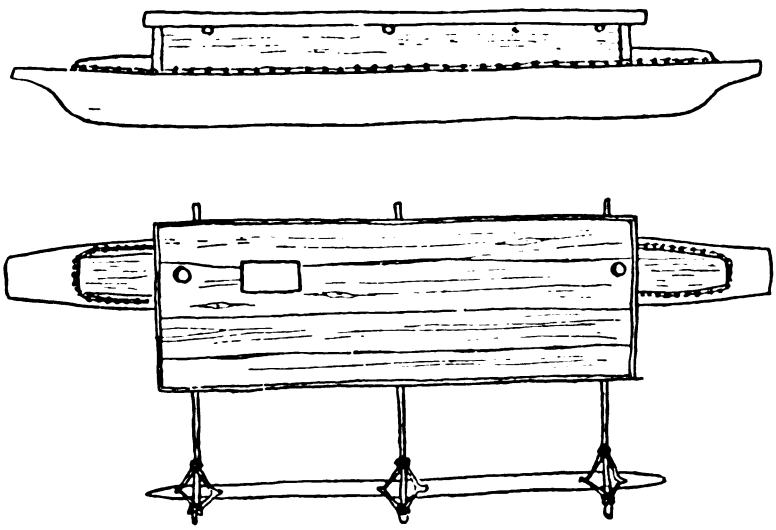

FIGURE 2.—Sea-going canoe, New Caledonia, elevation and plan (drawn by Paul Montague).

3. The hull of the sea-going canoe (figs. 2, 3) resembles the foregoing, but the gunwale is pierced all the way around with holes about ¼ inch in diameter and 3 inches apart, by means of which the washstrakes are attached. The washstrakes range from 3 to 4 inches to more than 1 foot in height and their lower edges are pierced with holes, corresponding to those in the dugout, to which they are attached by lashings that pass over a split sapling previously laid over their junction. The strakes are a little shorter than the cavity of the dugout, and the interval between them is inclosed at each end by a flat breakwater. There still remains an open space between the breakwaters and the ends of the canoe; this is decked in by a thick piece of light wood bound on in the usual manner. All cracks and joints intended to be watertight are calked with a waxlike substance made by chewing the buds of a shrub. The booms are attached to the top of the washstrakes, which are cut out to receive them so that the platform deck may lie flat. The outrigger apparatus is precisely as in the other canoes, except that the Y sticks are necessarily longer and that the booms project slightly over the opposite side of the hull (fig. 2). Supported by the booms and washstrakes is a deck of planks that projects over both sides of the hull, particularly on the outrigger side. A hole for the mast is pierced through this near each end, and there are one or more hatches leading down into the hull. In the old canoes this deck was doubtless lashed on, but for many years it has been attached by means of nails. In sailing, the float is sometimes carried on the weather side and sometimes on the lee side. There seems to be no fixed practice; one may see canoes running in the same direction with the outrigger on opposite sides. Two of these canoes were occasionally attached to each other to serve as a double canoe for turtle fishing (Montague, MS.).

Compton (1917, p. 100) says of the sea-going canoe: "The whole structure is made watertight by means of split saplings and plugs of niaouli [*Melaleuca viridiflora*] bark, caulked with resin obtained by chewing the buds of a species of *Gardenia* abundant in the forests."

Sarasin (1929, pp. 84-87, 272) gives the following information concerning single canoes:

> The canoes are 3 to 8 meters long and hold 6 to 8 persons. A washstrake is sometimes added and a massive end-piece or decking covers the cavity of the hull at each end and between the ends of the washstrakes and the solid ends of the hull. A strip of wood covers the joints, and the parts are bound together with coconut fiber passed through burnt holes; the resin of araucaria and dammar are also used for calking. In the south of the island araucaria is largely used for canoe-making, but the kauri and other trees are also employed. Some hulls are made of two pieces joined together in the middle. One end of each half is cut square and the rim of this squared piece is perforated for the lashings that unite them (Sarasin, 1929, pl. 8, fig. 4). That such a joining may be made in small canoes is shown in a sketch (Sarasin, 1929, pl. 67, fig. 4) which represents a half canoe 3 meters long, at Rô in Mare, which had served for the coffin of a chiefling and his wife.
>
> The outrigger must be to windward as a counterpoise to the distended sail. A large paddle serves as a rudder. There is a low balustrade on one side. Iron is never employed in the construction of canoes.

FIGURE 3.—Sailing canoe, New Caledonia (photograph by R. H. Compton, 1914).

All the single canoes are provided with an outrigger. The float is pointed at each end. There are three booms, but only two in frail canoes; they are straight, parallel, and horizontal, and about 3 meters long. The attachment of each boom consists of two forked sticks. The stem of the Y stick is so deeply embedded in the float that it becomes in the great majority of canoes a V attachment. In many canoes there is a stringer across the booms over the attachments.

The mast is 5 to 6 meters high and is set in a cavity or in a hole in a shoe (Holzkugel). The Oceanic lateen sail is made of mats fastened together. The mats are made by the women, generally of strips of pandanus leaf, though coco-palm leaf and other materials have been recorded. A spar along one side of the sail lies against the mast, and a weaker one on the other side extends obliquely to catch the wind.

Glaumont (1889, p. 107) describes the outrigger float as "simulating a fish and often the eyes are indicated".

In the Bankfield Museum, Halifax, is a model of a spritsail canoe from the Loyalty Islands with two booms, high washstrakes, and a platform; each attachment consists of a single pair of parallel vertical sticks. For the present it must be left an open question whether or not this represents an indigenous method of attachment. Leenhardt (1909, p. 32) figures a single canoe with two sails, but Sarasin says this is rare. Most small open fishing canoes have no sail.

Imhaus (1890, p. 65) gives a meager account of the canoes. His illustration (1890, pl. p. 48) shows a "pirogue canaque . . . photographe à Noumea" unlike the ordinary canoes of New Caledonia:

The canoe is a large dugout with gunwale poles and four outrigger booms, of which the two central are nearer to each other than to the others and they are connected only by stringers; the attachments consist of some four pairs of undercrossed sticks and there also appear to be two Y sticks, the arrangement of which is indistinct.

Leenhardt (1930, pl. 13, fig. 1) gives a photograph of the "last old canoe at Houailou":

The outrigger has three attachments of the usual type. The mast is amidships. The sail is set at an angle of about 45 degrees and is sharply pointed below; the raised end is straight, the two spars are bent. The photograph does not show the details very clearly.

Leenhardt (1930, pl. 4, fig. 2) shows a man at Houailou calking a canoe with *niaouli* (*Melaleuca*) bark; the holes in the hull and strakes are burnt through by means of a hot shell.

Monsieur R. G. Bresson gave Montague the following terms:

	Hull	Boom	Float	Paddle
Balade, almost the same language as Bélep	ouange (wangwe)	poualame	adiâi	hâgne
Pouébo	ouange or kalabé	poualame	adiâi	hène ouangue (leg of the boat)
Bonde	ouogne	poualame	adiâi	ko ounge
Ouébias, Diaoué, the same language	ouàngue	poualame	adiâi	hène ouangue
Houailou (Uailu)	kouin or kwa	kiaro	douiou (diviu)	voué
Nakéty and Thio	kouin or kwa			

Note: The first four districts are in the northeast of New Caledonia, north of 21° S., and the same terms are common to them. The last two districts are to the south of the foregoing. The outrigger connectives are called *mu* at Houailou.

Lambert (1900, p. 265) gives a view of the port of Vao in the Isle of Pines in which one single canoe, with two booms with direct lashed attachments to the slender float, is shown. The author does not refer to this attachment and it may be merely a mistake of the draughtsman.

Leenhardt (1930, pl. 13, fig. 2) illustrates an ordinary canoe, a double canoe, and several hulls of the Isle of Pines, but the details are not shown clearly.

DOUBLE CANOES

Double canoes in New Caledonia and the adjacent islands have been superseded by boats of European type. Formerly double canoes must have been numerous, as Captain Cook (1777, vol. 2, p. 104) speaks of seeing 10 or 12 large canoes at Balade in the northwest, and Cheyne (1852, p. 46) counted 19 war canoes of this kind at the same spot; he says each held 35 to 40 men. Several writers refer to the similarity of these vessels to those of Fiji, but state that they are not so well built. The earliest account is that given by Captain Cook (1777, vol. 2, p. 125):

"The canoes, which these people use, are somewhat like those of the Friendly Isles [Tonga]; but the most heavy, clumsy vessels I ever saw. They are what I call double canoes, made out of two large trees, hollowed out, having a raised gunnel, about two inches high, and closed at each end with a kind of bulk head of the same height; so that the whole is like a long square trough, about three feet shorter than the body of the canoe; that is, a foot and a half at each end. Two canoes, thus fitted, are secured to each other, about three feet asunder, by means of cross spars, which project about a foot over each side. Over these spars is laid a deck, or very heavy platform, made of plank and small round spars, on which they have a fire hearth, and generally a fire burning; and they carry a pot or jar to dress their victuals in. The space between the two canoes is laid with plank, and the rest with spars. On one side of the deck, and close to the edge, is fixed a row of knees, pretty near to each other, the use of which is to keep the mast, yards, etc., from rolling overboard. They are navigated by one or two latteen sails, extended to a small latteen yard, the end of which fixes in a notch or hole in the deck. The foot of the sail is extended to a small boom. The sail is composed of pieces of matting, the ropes are made of the coarse filaments of the plantain tree, twisted into cords of the thickness of a finger; and three or four more such cords, marled together, serve them for shrouds, etc. I thought they sailed very well; but they are not at all calculated for rowing or paddling. Their method of proceeding, when they can not sail, is by sculling; and for this purpose there are holes in the boarded deck or platform. Through these they put the sculls, which are of such a length, that, when the blade is in the water, the loom or handle is four or five feet above the deck. The man who works it stands behind, and with both his hands sculls the vessel forward. This method of proceeding is very slow; and for this reason, the canoes are but ill calculated for fishing, especially for striking of turtle, which, I think, can hardly ever be done in them . . . Their canoes are about thirty feet long, and the deck or platform about twenty-four in length and ten in breadth . . . The holes, made in the several parts, in order to sew them together, were burnt through."

The account given by Dumont d'Urville (1834-35, vol. 2, p. 427) is evidently an imperfect abbreviation of the foregoing. He also appears to have copied (1834-35, pl. 52, fig. 4) with modifications the illustration given by Labillardière (Atlas, 1811, pl. 44):

The hulls are clumsy dugouts with square ends and a broad shelf. Each edge is provided with a narrow washstrake, and the breakwaters are of the same height. The hulls are 3 feet apart and are connected by numerous cross poles. A boarded platform covers the hulls and the fore and aft ends of the interspace between them; there is a fireplace in the center of the aft end. There is a balustrade of more than 20 club-shaped uprights connected near their upper ends by a longitudinal pole. At one end of the platform of one hull is a vertical board with a rounded top and pierced by four holes, and at the opposite end of the platform of the other hull are three vertical sticks. A furled sail is lying on this hull, and two men are sculling.

Lambert (1900, p. 265) shows a double canoe of the Isle of Pines, but the details are not clear. There is a gable-roofed hut on the deck and the planked deck is supported on transverse poles that rest on the fairly high washstrakes. The washstrakes extend over only the central part of the hulls.

A detailed account of the making and rig of the old type of double canoe of the Bélep Islands to the north of New Caledonia (fig. 4, *b*) and also of the rites and ceremonies connected with the manufacture and launching of a canoe, as well

as the evoking of a tempest and the making of a calm, is given by Lambert (1900, pp. 183-203). As there is no large timber in the Bélep Islands suitable for making dugouts, the islanders have to go to the mainland where they procure canoes in rough, cut for them by the natives.

Each hull is generally composed of two trunks joined end to end by a strong binding and the joint covered with the bark of the *niaouli*, which serves as a kind of calking. Part of the opening at the two ends is covered with squared boards, and the remainder is encased between two planks [washstrakes], 25 cm broad, placed vertically and carefully lashed to prevent water from coming in easily [but Lambert's drawing (fig. 4, *b*) does not show these structures]. On the upper part of these planks are securely fixed transverse poles on which longitudinal planks are placed close together, the central plank being pierced with holes. Upon this planking, which serves as a bridge, is erected a low railing, the rudely carved supports of which are usually ornamented with carvings when the canoe belongs to a chief. The two ends of the hulls are alike and there is neither bow nor stern. A large canoe may be 20 meters long and 3.5 meters wide.

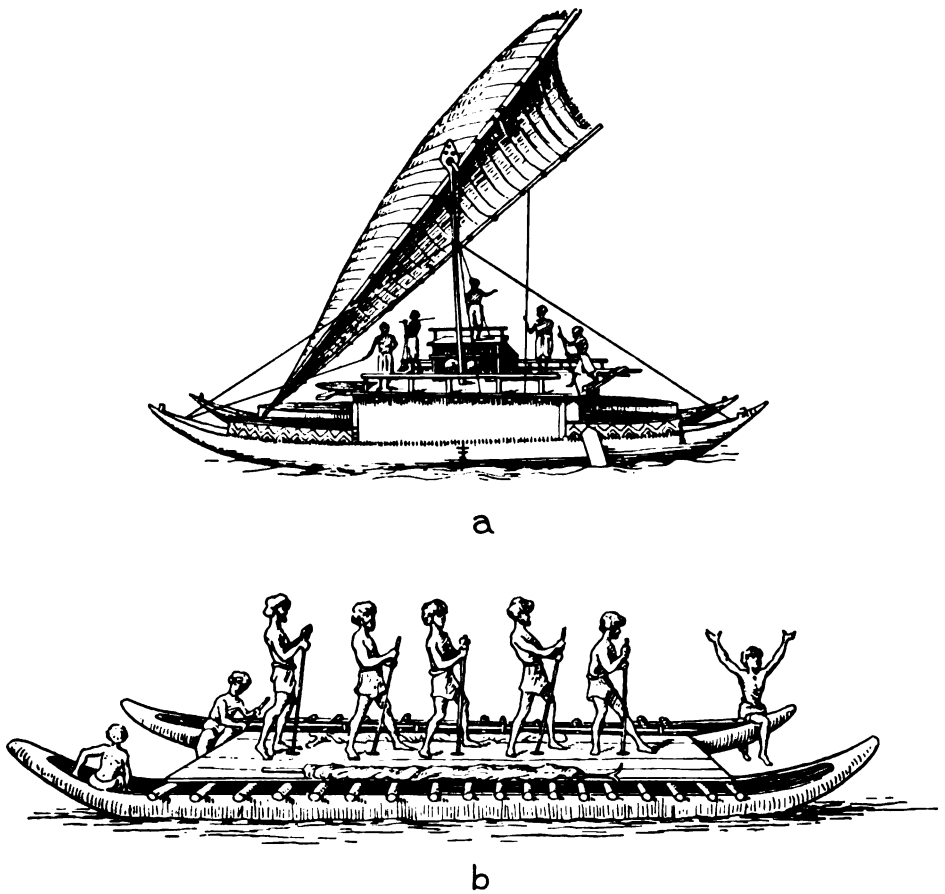

FIGURE 4.—Double canoes: *a*, New Caledonia; *b*, Bélep Islands (after Lambert, 1900, figs. 13, 44).

There are two pandanus leaf sails of the Oceanic lateen type. The movable masts are two strong poles, forked at the upper end; the foot is placed in a shoe or notch and held slightly inclined by shrouds. The sail is hoisted by a halyard that passes over the fork of the mast. A spar is fastened to one side of the triangular sail and lies close along the mast. Another

spar, thinner and longer, takes an oblique direction and opens the sail to the wind; it is to this spar that the sheets are fastened.

The canoe may also be propelled by paddles, long poles for punting, and sculls; the sculls are 2 meters long. A man stands by each hole in the central plank of the platform, inserts the scull through the hole, and gives it a half-turn from right to left with a thrust from front to back [as in Fiji]. A man in the bow signals when rocks are approached, which are avoided with skill. There are relatively few grave accidents, as the men know how to foretell and choose favorable weather. This was the type of double canoe that was employed in the north during the middle of the last century.

Lambert (1900, p. 196) says that from time immemorial nearly the same type of canoe prevailed throughout the archipelago. In the south, however, the sculling poles were not used and the natives preferred the use of a "false bridge", which has certain advantages but also inconveniences. He gives illustrations of various types of canoes (1900, figs. 13, 44, 45, 50).

Lambert points out that today (1900) the south of the archipelago has a kind of canoe which differs from that of the center and north of the island. There is a hut in the middle of the platform and only one sail, the surface of which should be equal to that of the two old ones. This difference is explained by the following tradition:

At the time of a chief said to be Kaoua, father of Toourou, strangers arrived at the Isle of Pines in a large canoe which had only one sail and a hut on the platform and sailed so well that it evoked the admiration of all, so that without hesitation they adopted the new system. The Kougnie, the men of the Isle of Pines, say that these strange visitors came from near Tonga. They remained some days in the island and then went to the Loyalty Islands. The Ti-Kougnie, relying upon their new method of navigation, did not delay to resume intercourse with the tribes of the south of the great island, maybe by wars, maybe by friendly relations. They went as far as Canala on the east coast and to Noumea on the west coast. The various tribes also admired the new canoe and hastened to adopt it.

Double canoes are now obsolete. Sarasin (1929, pp. 87-90) saw the remains of one with boards carved with geometric patterns at Touaourou, near the southeast point of the island, and Compton (1917, p. 99) saw fragments of an old one on the Isle of Pines. These evidently were of the southern type.

Double canoes served for long voyages and for warfare. According to Ray (1917-b, p. 264) the Lifu *huilu* were made in New Caledonia. Legrand (1893, p. 167) says canoes were built at Hienghene on the northeast coast for Uvea. According to Garnier (1871, p. 316) they were also made for Nenema in the northern islands. They were bartered for daughters, necklaces, slingstones, and other valuables.

Their length ranged from 10 to 15 meters. The largest one seen by De Rochas (1862, p. 175) was 14.5 meters long, 3 meters broad, and 1.10 meters high. De Rochas, Patouillet, and Glaumont state that one hull was smaller than the other and served as an outrigger float. The distance between the hulls was 1 meter or at most 1.25 meters. The ends of the hulls for a distance of about 1 meter were decked with planks, and transverse poles were lashed onto the upper border of the washstrakes; they crossed the remaining central portion and extended a short distance beyond each outer side of the hulls. Planks were laid longitudinally across the poles, and on the sides of this platform a balustrade was erected (fig. 4, *a*).

The platform carried one or more fireplaces, and a small wooden house with grass walls might also be erected in its center. This had room for four to six persons in a lying or crouching position and for provisions and a hearth. These huts had only a low doorway and the roof had a deck for the commanding officer.

The vertical planks of some double canoes, especially those of chiefs, were decorated with geometric patterns. There might be rude carvings at the ends of the hulls, and De Rochas refers to a fantastic carving of a fish at the bow. Hadfield (1920, p. 102) says that the canoes of the Loyalty Islands "were sometimes ornamented with crude designs, burnt into the wood, and rows of white cowry shells."

There were two masts (or sometimes only one) which supported large triangular Oceanic lateen sails. In Lambert's drawing (fig. 4, *a*) the single mast is apparently stepped in the larger hull and has an expanded perforated head. The halyard is rove through the lowest hole. The boom is a thin spar and is connected below to the much stouter yard. The ropes do not appear to be drawn correctly. The hull is evidently made out of two tree trunks joined together.

A model in the Köln Museum shows one hull somewhat larger than the other. The balustrade is on the outside of the platform over the larger hull, as in a model in the British Museum (Edge-Partington, 1895, pl. 67):

> The breakwaters of the smaller hull are very tall. The two masts are stepped in cubical blocks lashed along the middle line of the platform. Their ends are carved and terminate in a fork. There are two fore-and-aft stays for each mast. The sails are triangular with a concave upper edge. One straight, stout spar, the yard, lies against the mast. The long, slender boom is curved and its lower end is tied to the yard a short distance from its lower end. There is a long horizontal rudder.

Patouillet (1873, p. 124) says: "The two masts, kept in an oblique line from stem to stern by means of a system of ropes rest on, without entering into, two balls of hard wood, which are notched and are fixed to each end of the canoe. The sails, pointed below, are immense triangles of matting." It appears from his plate that the forward mast is placed on the larger hull and the aft one on the smaller hull. His illustration shows that one side of each sail is supported by a strong spar, the upper end of which is received in the fork at the top of the mast and the lower end is fastened to the edge of the platform over the larger hull. The other side of a sail is bound to a thin spar. There is a balustrade along the outer edge of the platform over the larger hull.

The paddles were about 6 feet long and 6 inches wide. Only with difficulty could double canoes be punted with long poles in a shallow sea. A large paddle provided with a ring which went over a projection at the end of the hull served as a rudder. According to Compton, four great paddles were carried on double canoes. Paddles are illustrated by Sarasin (1929, Atlas, pl. 9).

Hadfield (1920, pp. 99-103) gives the following information about canoe-making in the Loyalty Islands:

> The only available tools for canoe-making were small stone axes (*ze*) and adzes, which were made by the canoe-maker himself. When a suitable tree of hard wood was found, a fire was kindled about its roots. As the fire burned the tree the charcoal was chipped away till the trunk was almost burnt through, when a good strong push hurled it crashing to the ground. In a similar manner, by burning and chipping, the superfluous branches were removed. Through the end of the trunk a hole was burnt and around this a deep indentation was made. The men then passed a strong rope, or vine, through the hole, and several times around the deep cutting, and hauled it into the village (Hadfield, 1920, p. 43).
>
> By continual burning and chipping, the tree was rounded on the outside, hollowed inside, and pointed at both ends. A simple outrigger was made and fastened to the canoe by lashings through holes made by burning. Occasionally a part of the craft was decked over, and provision was made for a triangular sail (*sinyeu*). This consisted of two or three pieces of native matting, stitched together with a needle (*jebu*) made from the wingbone of the flying fox . . . Many of the canoes, especially those of Uvea, had a mast fore and aft; and in order to "'bout ship", it was necessary to move the sails by lifting them bodily over from one side to the other . . . Lashings and wooden pegs (*epen*) held these frail barks together and the sails in their places.

A large stone was used for anchor, and the bailer was either a miniature canoe or a large shell. The paddles and rudder were shaped like the paddle of a Canadian canoe, with long or short handles, and made of hard wood. Small canoes were paddled by men sitting. On the larger ones men stood, using the sides of the canoe as the fulcrum. None ever sailed with the outrigger to the wind. . . . Every canoe was the property of the chief, as well as of the man who made it. There were great rejoicings when one of the vessels was launched.

At a given signal, the whole mob in their war paint assumed a belligerent attitude, and with yells and shouts they brandished their clubs and spears, rushing at the canoe as though they would smash it. All the picturesque little canoes that used to sail up and down the lagoon have now been superseded by the white man's boat.

Hadfield (1920, p. 100) gives a plate showing a single canoe with two booms and a double canoe at Uvea. Nevermann (1936) gives some information, but his figure 11 is incorrect.

Erskine (1853, p. 339) refers to large double canoes at Uvea,

". . . resembling those of Feejee, but of much clumsier construction, and coarser workmanship. A platform or deck was built over the two bodies, and a rail or balustrade ran along one side. . . . They were rowed in a clumsy manner, without rowlocks, by large paddles; another of which was used as a scull, to steer the vessel, the exertions of the people being great, and the speed small."

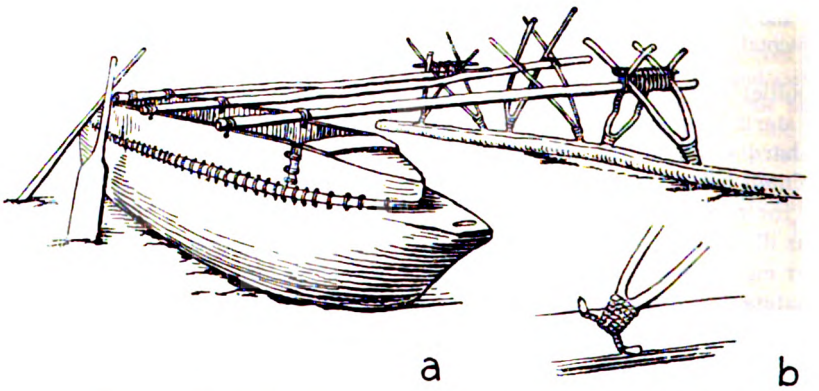

FIGURE 5.—Canoe and attachments: *a*, sea-going canoe, Mare, Loyalty Islands (after Sarasin, 1929, pl. 8, fig. 2); *b*, attachment with pegs of a model of a sailing canoe, New Caledonia (British Museum).

In the attachment fore and aft of the three booms of a canoe from Mare, Loyalty Islands (fig. 5, *a*), is a short stick or brace above the crossings of the two Y connectives which is kept in position by being bound to the boom. The boom itself passes under the crossings in the usual manner. This brace is like the one lashed to the double U connectives of Tongan canoes (Hornell, 1930, p. 300), in which it serves a practical purpose which is lacking here. Sarasin (1929, pl. 8, fig. 3) shows a canoe from Ounia, southeastern New Caledonia, in which only one attachment has this arrangement. A photograph of a canoe at Mare (fig. 6), Loyalty Islands, shows a very short peg inserted into the float on each side of each connective and lashed to the base of the Y connective. I have not seen this device in any other photograph, but there is a rough model in the British Museum which shows it clearly (fig. 5, *b*). Hornell (1930) demonstrates that in Tonga the U connectives are attached to the float solely by a similar contrivance. Two characteristics of Tongan attachments are thus repeated in the Loyalty Islands and one of them in the southeast of New Caledonia. Perhaps further evidence will show that the distribution is wider in these islands. In the Loyalty Islands they appear to have

no real function, for in the great majority of canoes they are absent; they can be easily explained by the known Tongan influence in Lifu.

The distinction of the northern people of Uvea from those of the southern part, Iai, and from the other islands is evident in their canoe terms. Ray (1917-b, p. 308) gives the following:

	Canoe	Float	Paddle	Sail
Nengone (Mare)	koe	.....	xaru	sinyeu
Dehu (Lifu)	he	hnapan	galu	sinyeu
Iai (southern part of Uvea)	hu	aben	galu wasatro	hunyu
Uea (Uvea or Hnie)	vaka, galu	ama	foe	la

Ray (1917-b, p. 242) says, "Uvea is properly only the name of the Polynesian people on the north part of Hnie [Uvea], who are said to have come from Uvea or Wallis Island, north of Tonga, between Samoa and Fiji." He gives for Lifu: raft, *iwenge;* single canoe, *he;* float, *hnapan;* double canoe, *huila;* mast, *qana;* mat sail, *sinyeu;* long steering oar, *iuj.*

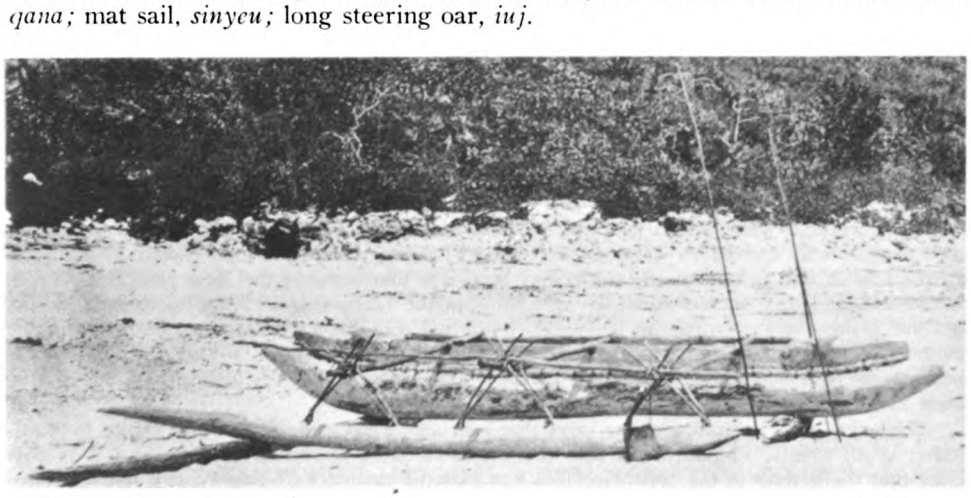

Figure 6.—Sea-going canoe with pegs in the float for the connectives, Penelo, Mare, Loyalty Islands (photograph by Dr. Jean Roux).

Lambert (1900, p. 54) says that it is beyond doubt that a considerable group of Uveans came in canoes about 100 years ago to this archipelago. They were stranded on one of the Loyalty Islands, to which they gave the name of their former country. Halgan Island is known today only as Uvea. This colony of the yellow Polynesian race mixed with the original race.

At the south of Lifu is a village called Tonga which was settled by shipwrecked people from that island about the beginning of the nineteenth century.

RAFTS

Sarasin does not know of catamarans or rafts from New Caledonia, but they are recorded for the Loyalty Islands. Erskine (1853, p. 363) saw at Lifu "a rude raft or catamaran", and a few men and women swam off to the ship with a "rough log of wood as a kind of assistance." According to Hadfield (1920, p. 102), "Catamarans, or rafts (*iweng*), were handled with great skill; every man was an adept at sculling, either with a long pole or a single oar."

NEW HEBRIDES

The canoes of the New Hebrides are universally dugouts with a single outrigger. Most observers describe them as clumsy and badly made. Codrington (1891, p. 292) says that before the time of the labor trade, "red 'butterfly' sails were the common and pleasing ornament of an island scene in the New Hebrides and Banks groups."

The following general account of the canoes of the New Hebrides is taken from Speiser (1923, pp. 249, 250).

> For some years past outrigger canoes have been used merely for coastal trade and so only small vessels are now employed. Large vessels which could hold 40 men and were used for voyaging between the islands have long been replaced by whaleboats bought from Europeans. The first whaleboat was bought at Vao in 1906 and from that time the old large canoes have no longer been seen. Eckardt (1877, p. 19) speaks of canoes without outriggers but there is no other similar record.
>
> Not all the coastal people are good seafarers. Canoes are very rarely seen on northeast Espiritu Santo, but the natives of the west coast of Big Bay are good sailors, as are the inhabitants of the numerous small islands on the south coast of Santo, and those of Malekula and Efate, as well as those of Malo, Vao, and the neighboring islets, of the Banks Islands, and of Aniwa, Futuna, and Aneityum. Not more than was absolutely necessary did the people of Ambrym, Oba, Pentecost, and Maewo venture upon the sea. Canoes were totally wanting on the west coast of Malekula. In later years navigation has been entirely dead in the Torres Islands.
>
> Long voyages were seldom taken in the New Hebrides. The journey from Vao to Oba or to Ambrym was considered a good performance; New Hebrides people sailed also to the Banks Islands, but it was mainly the Banks Islanders that came to the New Hebrides. From island to island they wandered as far as Efate, but the journey from Efate to Eromanga was not undertaken by the natives in historical times, and this explains the great difference in the culture of the southern and central islands. So far as Speiser knows, voyages to other archipelagoes were not undertaken, though Fijians, Tongans, and other Polynesians came to the New Hebrides.
>
> Thilenius, in a letter to Speiser, says that journeys were made from north Santo to Vanikoro; at all events, Vanikoro and also the Solomons were known to the natives. It is now clear that the natives in the New Hebrides knew of the existence of Santa Cruz and the Solomons, but Thilenius believes they have never been there unless it be in recruiting ships. It appears more probable that the inhabitants of Vanikoro or of Nitendi might occasionally reach the New Hebrides, for they are the true voyagers of this district.

The largest canoes today can not hold more than 6 to 8 men. The hull is made of the breadfruit tree, the float of the wood of the wild cotton tree. The hull is hollowed out by fire and with stone or shell axes and adzes. After the final working with small stone adzes, the canoe is taken to the water. In all canoes of the area, with the exception of those of Santa Cruz, the opening is so broad that a man can sit comfortably in it, but the cavity decreases irregularly owing to the careless workmanship on the canoe. The hull is commonly quite crooked. There is generally a concave curvature of the hull so that the bow and stern are raised. The more slender part of the canoe forms the bow while the stern is stout and cut abruptly; thus the weight of the vessel lies behind and the bow is often clear of the water. The old type of sail is now only seen at Vao and Atchin off northeast Malekula.

Somerville (1894, pp. 374-375) says that the small canoes of the islands of the New Hebrides which he visited in 1890 and 1891 are all fitted with outriggers on one side and are made of the trunk of the breadfruit tree, partly burnt out and partly hewn:

The external shape is quite rough, the ends being carelessly pointed off, and very few of the small smooth-water ones follow a straight line between the extremities, but are in every imaginable curve, some with an s-like bend. "The upper part of the gunwale in the midship part of the canoe is tapered off to a thin edge, and holes are bored through it to which the four or five rough boughs—they are little better—which support the outrigger-float are lashed with a cross fibre lashing. The float, pointed at both ends, but otherwise as irregular as the canoe, of which it is about one third of the length, is secured [to the booms] by short stout pieces of stick, pointed at one end, driven in the midship line of the float, so that each pair forms a St. Andrew's cross. Two such crosses abreast support each outrigger pole in which it rests, and to which it is then tightly secured with fibre . . . The outrigger poles generally extend out over the opposite gunwale as well, and a grating of cotton-wood or bamboo is lashed upon them on both sides of the canoe. Two paddlers sit upon these, and with one man at the bow and a steersman aft, complete the crew. The paddles are as roughly made as the canoe, the steering one being considerably larger than the others; there is no fulcrum used when rowing [paddling], but often for comfort of handling there is a T-head on the boom . . . The large seagoing canoes are built with much more care, and will hold 20 to 30 men . . . A sort of keel, somewhat of the size, shape, and appearance (only with more regard to straightness) of an ordinary canoe forms the foundation, and on it sides are built up of three or four planks each about a foot wide, which are sewn together through small holes along their edges with tough fibre, caulked with gum and payed over with lime. The ends of the plank do not extend to the actual bow and stern of the canoe—which are formed by the keel foundation log, sharply pointed off—but a heavy, thick board, broader at the top than at its base, where it fixes into the canoe, is planted athwartships at each end of the 'hold', and the planks are stoutly sewn to it. The planks do not overlap at all as in our boats, but as they follow the line of the end boards to which they are sewn they form a sort of trough with spreading sides. The end boards extend a foot or so above the planking to keep out the surf when launching or hauling up the canoe.

"The mast in all sizes of canoe . . . is generally a stout, moderately straight piece of bough, with a fork or 'jaws' at the foot, which rests on a stout transverse stick like a thwart, so that the mast does not touch the bottom of the canoe. It is supported on this thwart by fibre rope guys fore and aft, and the sail is hoisted on it, the halliards reeving through a hole burnt in the head. By this means the mast can be 'stepped' at any part of the boat, there being several of these thwarts acting as strengtheners, and can also be inclined at any angle towards bow or stern, and lowered quickly in case of a squall." This sail is of the Oceanic lateen type.

Douceré (1924, p. 28) does not supply any useful information about the "pirogues" of the New Hebrides. He gives a poor photograph, apparently from a model, showing three irregularly spaced booms; it is without a provenance.

ANEITYUM

I have not found a description of the canoes of Aneityum (Anaiteum, Anatom). There is a model of a dugout (*nelgau*) in the Edinburgh Museum, the hull of which is more raked at one end than at the other, and the flat unhollowed part of each end is prolonged into a shelf (fig. 7, *b*). The three booms are lashed to the gunwales of the hull and are not regularly spaced. The attachment consists typically of three pairs of convergent sticks which cross over the boom and two somewhat oblique sticks which are inserted into the float below the boom to which they are fastened, one on the outside and the other on the inside of the other sticks (fig. 7, *c*). Ray informs me that Inglis in his dictionary gives *nelcau* for canoe; *n* is the article and *elcau* is canoe (*c* is pronounced *g*). Ray considers that the word should be written *negau* (*ne* is the article and *gau* is the word for canoe), as in Tanna, and that *gau* is probably the Indonesian *kayu*, tree or dugout.

TANNA

Captain Cook, who discovered Tanna in 1774, gives the following account of the canoes (1777, vol. 2, p. 78):

"These canoes were of unequal sizes, some thirty feet long, two broad and three deep; and they are composed of several pieces of wood, clumsily sewn together with bandages. The joints are covered on the outside by a thin batten champhered off at the edges, over which the bandages pass. They are navigated either by paddles or sails. The sail is latteen, extended to a yard and boom and hoisted to a short mast. Some of the large canoes have two sails and all of them outriggers."

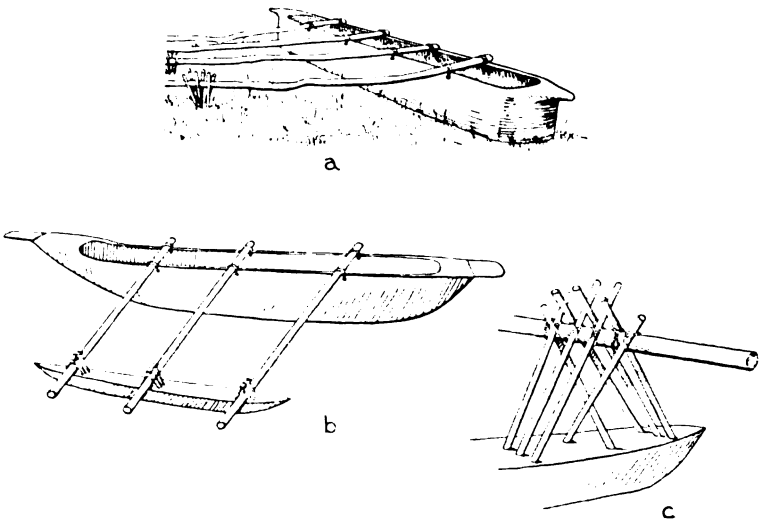

FIGURE 7.—New Hebridean canoes: *a*, outrigger canoe (*nengau*), Whitesands, Tanna (after photograph by C. B. Humphreys); *b*, *c*, model *nelgau*, Aneityum (Edinburgh Museum), and details of connectives.

Friederici (1912, p. 308, fig. 123) refers to two kinds of canoe at Weasisi Tanna, one with and the other without a boxlike superstructure:

The superstructure which is usually in one piece [Friederici's sketch shows two long end-pieces and a central strake] gives an impression of great plumpness and causes the canoe to project extraordinarily far out of the water. Ornamentation is lacking, the hull and float being of a natural grey color. There are three booms, each being attached to the float by three pairs of crossed sticks [as Friederici compares this arrangement with that found in Polynesia and Fiji it may be assumed that the sticks cross over the boom], but a vertical stick is added to the two outer booms.

The Tannese canoe (*negau*), according to C. B. Humphreys (1926, pp. 67-69), is exclusively of the single-outrigger type, and is said to be built today on the same lines as the ancient model.

The canoe is invariably a dugout, scooped out from the trunk of a tree by the aid of a knife or by burning, exactly as in Eni and southwest Mare in the Loyalty Islands (Sarasin, 1917, p. 228). European knives are now used, but in Cook's time the Tannese were found using "hatchets" with blades of black stone or broken shell, as in Tonga and the Society Islands (Forster, 1777, p. 313). There are several athwartship booms cut to fit into grooves in both gunwales. The float is modeled more or less like the canoe on a small scale, though it is not hollowed; the top is left flat. The attachment sticks are inserted into holes on the flat surface of the float and cross over the booms, to which they are securely lashed by woven strands of native fiber. The booms are not evenly distributed across the canoe but there seems to be no uniformity in this irregularity when different craft are compared, and the man (or men) at the paddle seems never to sit in any special space between these booms. As many as 8 or 10 persons generally occupy the large canoes. The breadfruit tree is commonly used for canoe-making. The paddles are spade-shaped, most of them about 2 feet long, though longer ones are occasionally used; heavy and shapeless forms prevail throughout the New Hebrides

[and Banks Islands (Codrington, 1891, p. 297)] and these show no decoration whatever, nor was it customary at any time to add any ornamentation.

A photograph taken by Humphreys shows a blunt, almost square-ended dugout with a projecting shelf at each end; the four booms rest on the edges of the hull, to which they are lashed (fig. 7, *a*). Another photograph (fig. 8) shows a dugout with the bow more like that of an ordinary boat. There are long, massive end-pieces and the space between them is filled by a correspondingly high strake. The four booms appear to rest on the strakes. Four or five pairs of attachment sticks cross over the boom.

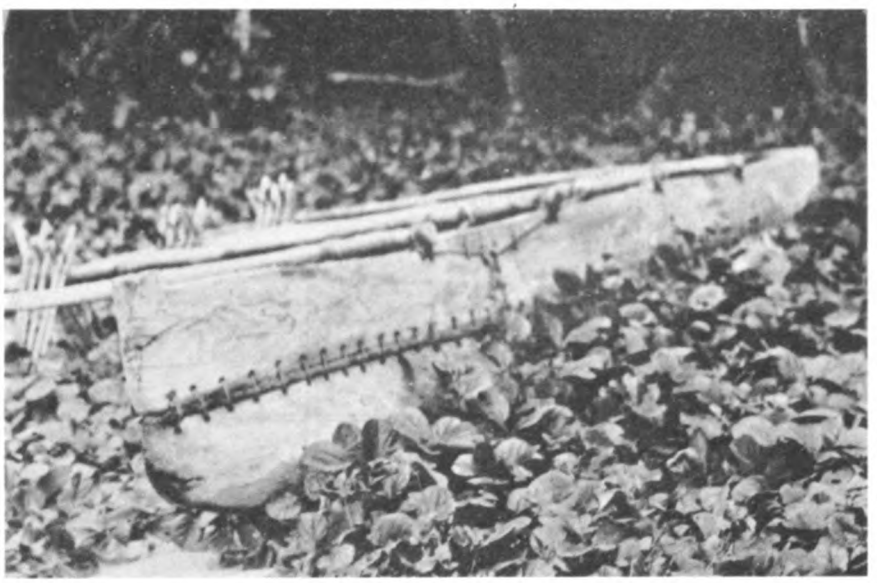

FIGURE 8.—Single-outrigger canoe (*nengau*), Tanna, New Hebrides (photograph by C. B. Humphreys).

Canoes were usually made by the people living nearest the places where the best material for their manufacture was known to grow, and inland people have been found expert in making canoes. The descent of the art from father to son appears to be unknown, nor are there any guilds or anything resembling them in connection with canoe building. All recollection of ceremonies connected with canoe building seems to have died out.

Navigation has evidently played a minor role in the life of the Tannese. Today there is constant intercourse by means of small cutters, manned entirely by natives, between Aniwa and Tanna, but it is significant that the boats are owned exclusively by Aniwans; the voyages originate from that island, which is almost pure Polynesian. Nevertheless, there are always sporadic voyages in canoes from Tanna to the other four islands of the southern New Hebrides. The voyaging is generally accomplished during the daylight hours. When it is necessary to navigate at night, the steering is always done by the land outlines and not by the stars. Sailing by the stars seems to be unheard of, for the constellations are practically unnoted by the Tannese. Humphreys (1926, p. 69) refers to a tradition that some Aniwans and Tannese were blown by bad weather to "Emai", about 130 miles north-northwest. There they built a new canoe and returned to their own islands.

There is no recollection of the arrival of immigrants from other islands apart from those to the south.

FUTUNA

Murray (1863, pl. p. 12) gives an illustration of a "Fotuna" canoe. A washstrake runs along the whole length of each side of the dugout and a narrow slat covers the junction; the aft ends of the strakes, judging from the manner of paddling, slope downward to the seam, and the bow is provided with a small vertical breakwater, the lateral edges of which are concave; the fore and aft ends of the strakes are covered over. The two straight booms are fastened to the top of the strakes. There is a short float, and the attachment consists of three pairs of sticks which meet above, but do not cross over, the boom.

Lawrie (1892, p. 308) states: "On Futuna they have an ingenious method of heightening the sides of the canoes by building on extra pieces. They bore holes in the wood with a heated iron and sew on the slabs to the body of the canoe with sennit, plugging up the holes with coconut fibre."

Gunn (1914, p. 198), who went to Futuna in 1883, gives information which is quoted by Humphreys (1926, p. 116):

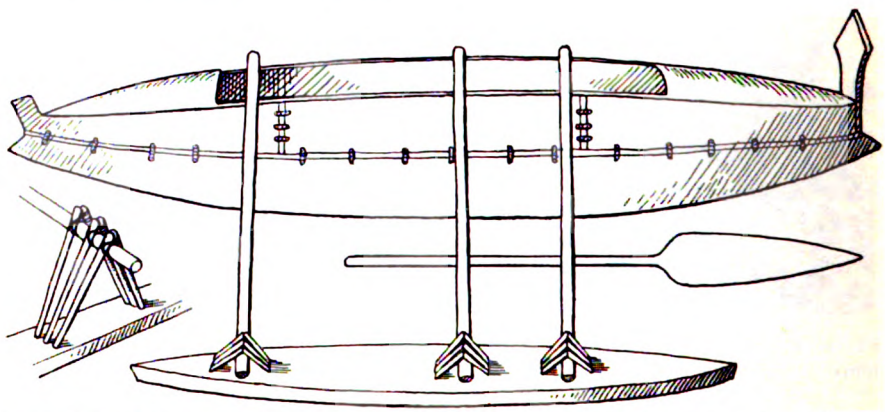

FIGURE 9.—Model *tavaka*, Futuna, New Hebrides, showing connectives and paddle (Edinburgh Museum).

> The ax and adz heads used in making canoes were ground from hard volcanic stone. The gouges were made of shells. Fire was never used when digging out the hulls. "A recess is hollowed in the bow and stern for fish-baskets. An ornament, supposed to resemble the tail of a fowl, is made at the stern. The sides are raised by a row of planks, sewn by sinnet, the holes being plugged with coconut fibre. The larger canoes are formed of two logs [end-to-end] firmly and skillfully bound together by sinnet. These Futunese canoes, now used when catching flying fish, were their 'ships' in early days, for going to other islands. Then two rows of planks raised the height of the canoes and kept out the sea. The baler is a wooden scoop with the handle inside. The natives never go to sea without a baler, as their canoes always leak more or less."

A model (fig. 9) of a Futunan outrigger canoe (*tavaka*) in the Edinburgh Museum has the following characters:

> The bottom of the hull slopes gently up to each end. There is a broad washstrake, the fore and aft ends of which are covered over, a small vertical spur at one end and a tall breakwater at the other, shaped like a gable-end with the lateral edges slightly concave. The three booms are attached to the top of the washstrakes, one just behind the opening of the

canoe and widely separated from the others, which are fairly close together. The float is canoe-shaped with a broad, flat upper surface. Each attachment consists of three pairs of sticks which meet above, but do not cross over, the boom.

ANIWA

The only information known to me about the Aniwa (Niwa or Immer) canoes are the few remarks given by Friederici (1912, p. 308). He says that there are, as in Tanna, two kinds of canoe, one with and the other without the boxlike addition, which is composed commonly of four pieces; he adds that this addition seems to point to relationships with Niue on the one hand and Anuda on the other. The hull with its outrigger apparatus appears to be quite similar to that of Tanna, but in Aniwa there is a vertical stick in addition to a fourth pair of overcrossed sticks. Canoe, *waga;* float, *tsi-ama.*

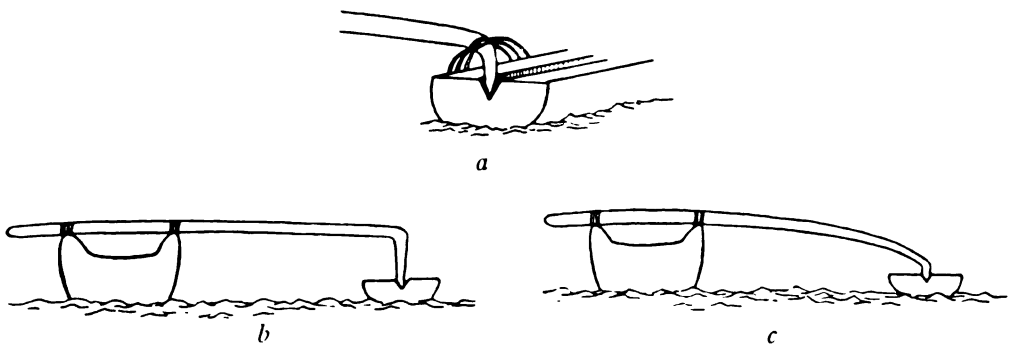

FIGURE 10.—Types of boom attachment, Eromanga, New Hebrides: *a*, attachment of boom to float; *b*, straight boom with right-angled bend, which is most common form; *c*, boom with downward curve (after Humphreys, 1926, p. 157).

EROMANGA

Hedley (1897, p. 287), on the authority of Mr. S. Sinclair, says that in Eromanga "the whole structure of outriggers and appurtenances takes to pieces and is packed up when not in use; when set up, a forked outrigger, like that of Funafuti, is lashed by the butt across the hull, while the distal extremity is received into a socket in the float, to which it is secured by fore and aft rope guys leading from the float to the fork; the whole structure is therefore flexible instead of rigid."

Robertson (1902, p. 374) writes:

"The canoe of Erromanga is of very rough manufacture. It is formed from the trunk of the *nemar* or breadfruit tree, and also from the *neblibli.* In early times the log was first burnt away to a length and then hollowed into shape by the same means and by stone axes . . . The canoes in use in the northern islands of the group are very much bigger and superior in every way to those made on Erromanga and one or two others of the southern islands. Strange to say, those again of Aniwa and Futuna are fairly large and beautifully built; the Erromangan canoes seem very poor by contrast."

Robertson (1902, p. 9) states that the Tannese and Aniwans used to go to Eromanga to obtain large supplies of a red clay *moap,* giving pigs, white shells, and other things in exchange.

The following account of the Eromangan canoe (*lo*) is taken from Humphreys (1926, pp. 158-164). (See fig. 10.)

Canoe-making is not the prerogative of certain men and all men may make canoes, though some are more proficient than others. The hull is generally made of *leple* or a *nemar* (breadfruit) trunk, and on the east coast no other trees are used. "After the bark is removed from the tree an incision is made along the trunk and a hollow trench is made about 18 inches deep and for the full length of the trunk. . . . Fire is not used in Eromanga to any appreciable extent, although it is not possible to say that it is never employed as an aid to the hollowing-out process. As many holes are then made in the gunwale, on either side, as there are to be booms (*mobok*), and the booms are placed across the canoe at intervals resting on the gunwales. These are securely lashed with a native fibre (*walenevao*), which is passed and repassed through the holes and around the boom alternately . . . The float (*neleman*) [fig. 10, *a*] is dug out much in the same manner as the canoe itself, on a smaller scale, the end of the boom having a sharp turn which is fitted into the groove or trench of the float and securely bound at the angle with the *walenevao*, fastened on either side of the boom, through holes prepared for that purpose, at two or three different places in the inner gunwale of the float. Sometimes the boom is carried out almost horizontally to the point where it turns at a right angle to meet the float [fig. 10, *b*], and again it drops gradually to the point where it turns [fig. 10, *c*] although [the first] is the much more common type. Canoes are usually not more than 12 feet in length, the usual complement of men being not more than five or six."

The paddles (*walasowa*) are short, with a fairly wide blade. There is no ornamentation carved nor is there any recollection of it. The canoes are steered by landmarks; as in Tanna, stars are not used.

"Canoes, even in the old days, were small and not suited to long voyages and very rough water, and it is certain that voyages to islands not in view are unknown today and are very unlikely to have taken place in the past" (Humphreys, 1926, p. 164).

EFATE

Erskine (1853, p. 325) refers to the ordinary Efate (Faté or Vaté, Sandwich Islands) canoes as similar to those of Samoa although of coarser model and workmanship, and he saw "a much larger canoe, on the body of which (apparently single) was built a kind of box to sit in, resembling a gondola without the enclosed top." Brenchley (1873, p. 217) saw "several small canoes, ill-made, having outriggers [floats] dipping at their ends and fastened by three wooden cross pieces [booms]." Somerville (1894, p. 373) states that the canoes "are small and will, as a rule, contain no more than five people, and that in smooth water; the original curiously shaped matting sail has been entirely discarded in favour of trade calico, and European pattern [in 1890-91]." He never saw ornaments of any kind on these canoes. A photograph taken at Vila [Fila] Harbor by A. R. McCulloch shows that the dugouts have a decided upwardly projecting rake at the bow and there is a gunwale pole; the three booms appear to be evenly spaced and each is connected with the short float by two pairs of undercrossed sticks.

Layard has given me the following terms obtained at Vila and Erakor respectively on the west and south coast of Efate: canoe, *tepake, raru*; washstrake, *perakuku, kortas*; platform, *firigi, nafetfet*; booms, *kiato, nakiat*; connectives, *alaku, lak*; float, *teama, nsem*; paddle, *foi, nawes*; mast, *tshira, natir*; sail, *tra, nlab*; bailer, *teta, nies*. Vila only: board with hole for mast, *teotu*; hole for mast in bottom of canoe, *tlake teotu*. These terms seem to indicate two different cultural settlements. Hagen and Pineau (1889, p. 314) give for Port Havannah, north Efate: canoe, *kararoua*; sail, *nalae*; paddle, *naosso*. Friederici (1912, p. 309) gives canoe, *rarua;* float, *semen*.

Canoes photographed forty years ago by W. J. Lindt at Havannah Harbor (fig. 11) show the following characters:

The fore end of the dugout varies slightly in form and always has a hole through it; the stern is cut square and is also perforated. There is a low washstrake. A lath covers the seam with the underbody, the lashings are vertical. There is a low fore breakwater, but an aft breakwater is certainly absent in some canoes. Four well-spaced booms amidships rest on the washstrakes; a longitudinal pole may be tied over their projecting off ends, or the booms may extend a considerable distance on the off side and carry a light platform of poles which does not extend beyond the outrigger side of the hull. In some canoes there is a platform of longitudinal poles over the booms, or there may be one or two stringers only. The attachments consist of two pairs of non-diverging undercrossed sticks.

The mast slopes slightly forward; the stepping is not clearly shown; the forestay passes to the hole in the bow and the aftstay is tied to the off end of the first or second boom. There is a short yard and a long boom with jaws which fit on the mast. The sheet is fastened not far from the distal end of the boom. The rig is evidently modern.

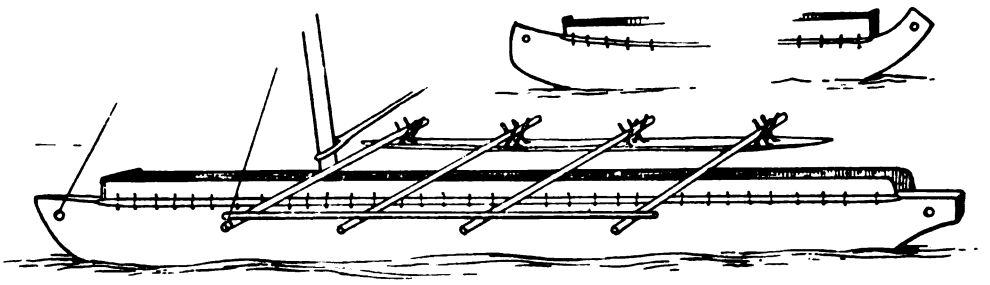

FIGURE 11.—Canoe hull and two bows at Havannah Harbor, Efate, New Hebrides (after photographs by W. J. Lindt).

EPI

Speiser (1923, p. 252) says that the canoes of Epi (Api) are of better construction than those of north Malekula. They are clumsy but of regular form. The ends are not high. The hull is straight and runs out into a flat beak. The booms are central and at equal intervals. The connection of each boom with the float is by two pairs of undercrossed sticks; occasionally a transverse spar (transverse to the booms) gives the booms more stability. There may be a platform. Formerly there were in Epi large canoes with planked sides.

Hagen and Pineau (1889, p. 314) give the terms: canoe, *oua*; sail, *male*; paddle, *naloua*.

MALEKULA

SOUTHWEST AND SOUTH COASTS

The small outrigger canoe for two or three men, now used everywhere, is said to have been comparatively recently introduced by returned recruits who had been working on other islands and is thus a result of the coming of Europeans. Judging from two small photographs taken by Deacon in 1926, these are clumsy dugouts with four evenly spaced booms and two pairs of undercrossed sticks with or without a central vertical stick.

According to Deacon (1934, pp. 204-211, and manuscript) there were formerly only two kinds of craft at South-West Bay, Malekula: 1, the *nimbembew* or large sea-going outrigger canoe carrying 30 or more men; 2, the small *nawangk ambu*, a bamboo raft without an outrigger.

The *nimbembew* was hollowed out of a large tree. On the bow was carved a face, like the faces on the large village gongs. The prow curved forward and was

carved to resemble the head of a bird (fig. 12); it was termed *nimbongon nawangk* (the mouth of the canoe).

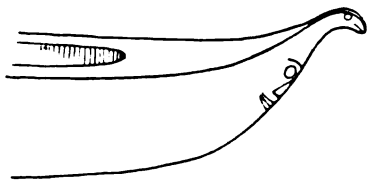

FIGURE 12.—Bow of a seagoing outrigger canoe (*nimbembew*), southwestern Malekula, New Hebrides (after a sketch by A. B. Deacon).

The booms (*newinei*) were carried athwart the hull and projected some distance on the off side. Bamboos were laid across the booms to form a platform on each side of the hull on which the paddlers sat; these bamboo platforms had the same name (*nawangk ambu*) as the bamboo rafts. Men sitting in the hull did not paddle. After the booms had been fixed athwart the dugout, boards equal in height to the diameter of the booms were inserted along the edge of the hull between the booms, so that a level base was provided for attaching the washstrakes (*neso*); these splayed slightly outward. Unfortunately Deacon did not record the number of the booms or the method of their attachment to the float (*nesem*). Presumably there were three or four booms and two pairs of undercrossed sticks.

A *nimbembew* was owned jointly by "two or three villages". Perhaps this means that a *nimbembew* was the joint property of members of a clan who might be residents of several villages, and doubtless the right to sail in one belonged solely to those who had clubbed together to make it.

The construction of a *nimbembew* was accompanied by payment of pigs and a ceremonial like those for a particular grade of the *nimangki* society. Payment of pigs had to be made to certain men who had previously made a *nimbembew*, and also for the carving. Before launching, the canoe was drawn through a fire in order to drive out from it the evil *temes* (spirits) it was supposed or liable to contain. The float was decorated with *nimbaur* leaves. A member of the group had the title of "Nimbembew". If a man who was not a member were to go in a canoe without having paid a pig for the privilege, he would incur the wrath of the *temes* which belonged to the canoe; these would cause him to fall sick and die, or they would "eat him". This was the Seniang custom and there is no reason to doubt that it applied wherever the *nimbembew* were made and used.

The *nimbembew* were used chiefly for expeditions to Tomman Island in the south and to Lambumbu in the northwest to attend *nimangki* or other ceremonies and festivals. According to Deacon their use extended from the Seniang district of South-West Bay around the south coast as far as Port Sandwich on the southeast coast. He was told that they were not used for fighting expeditions by the Seniang people.

About the end of last century there was a *nimbembew* at Tomman Island and one at Lambumbu. Mr. Boyd, a missionary who came to South-West Bay about 1895, never saw one of the large sea-going canoes. It is possible that these large canoes were vehicles for the diffusion of the *nimangki*; Tomman Island and Lambumbu may be regarded as the two centers from which its secondary diffusion spread over parts of western and southern Malekula. In olden days the officials of the *namu* ceremonies of the *nimangki* resided in Lambumbu and visited South-West Bay on occasion.

The introducers of the *nimangki* also brought the use of the mat or plaited skirt to Malekula and drove the indigenous inhabitants inland, except on part of the west coast in the district of Mewun, where the fringe skirt is used and the *nimangki* and other ceremonies and cultural traits are lacking. The raft was the only craft used by the older inhabitants.

Deacon made sketches (fig. 13) of the large outrigger canoe (*mbembeo*) of Tomman Island, which he distinctly states is not a *nimbembew*, though it may be a degenerated form of that type:

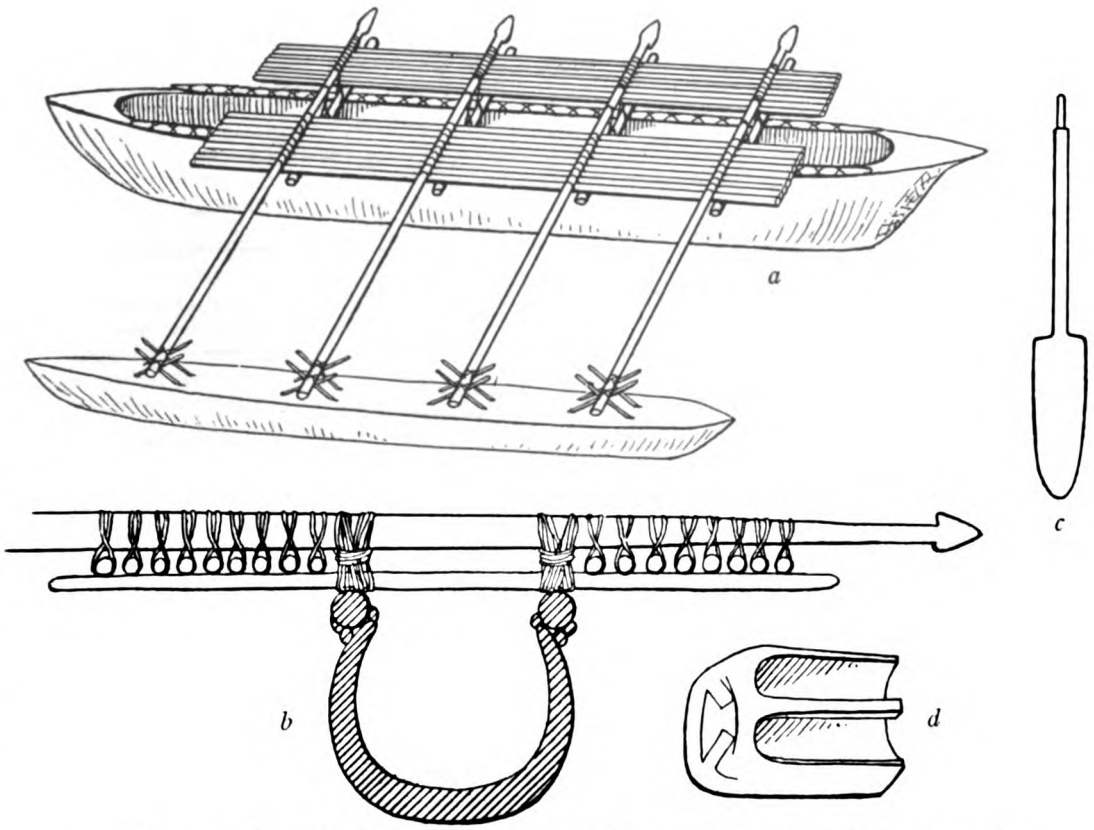

FIGURE 13.—Large outrigger canoe (*mbembeo*), Tomman Island, south Malekula: *a*, plan; *b*, section of hull showing the construction of the platform; *c*, paddle; *d*, bailer (after sketches by A. B. Deacon).

The canoe is a dugout about 24 feet (7.32 meters) long, bluntly pointed at each end, one end being produced to form a small beak; the sides tumble home. A pole (*neso*) is lashed on each gunwale, on each side of which, where it touches the hull, are supplementary laths, presumably to keep it watertight. Four transverse poles (*naai ririvi*) rest on and are lashed to the *neso* at equal intervals and project for some distance on each side of the hull; these support a number of close-lying longitudinal bamboos which form a platform (*nawank ambu*) on each side of the hull, but not over its cavity. The four booms (*niwinei*) rest on the platforms immediately above the *naai ririvi*, to which they are firmly lashed and they are also lashed to the bamboos of the platforms. Each boom extends beyond the offside platform and its end is carved into a cone. The float (*nesem*) is nearly as long as the hull and resembles it in general outline; the top is flat. Each boom is attached to the float by two pairs of undercrossed sticks (*niwin langalank*) and there is also on the inner edge of the float a slightly oblique stick which is lashed to the fore boom; probably there should be one to each boom.

The paddle (*nowoh*) has an elongated spade-shaped blade, and the shaft is round with a narrower, flattened grip. A wooden bailer (*nimbwia*) of the Oceanic type, with a straight inwardly projecting handle, is used on the east side of Malekula and round the south side as far as South-West Bay (figs. 13, *d*; 14); it is absent at Lumbumbu on the west side of the narrow part of the island.

Deacon refers casually in his manuscript to a dugout without washstrakes or built-up sides. He calls this canoe a *nimbembew*. The information is too uncertain to have much value, but it is worth noting:

> The ends were raised with planks to a height of some 7 or 8 feet (so that they must have borne a superficial resemblance to certain canoes of the Solomons). The prow was carved with a human face or with the image of a bird. According to a very rough sketch, the booms lay in notches in the edges of the dugout. There is in his sketch a washstrake on the outrigger side only, with corresponding notches for the booms; apparently the platform was only on the off side.

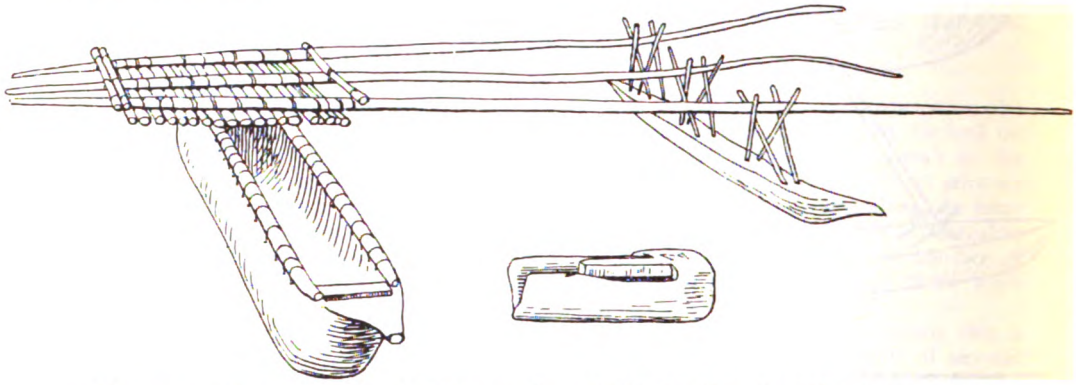

FIGURE 14.—Dugout canoe and bailer, southern Malekula, New Hebrides (after a photograph by Felix Speiser, 1923, pl. 63, fig. 1; bailer, pl. 64, fig. 2).

The *nawangk ambu* (bamboo raft) was built in the following manner, according to Deacon (1934, p. 210, fig. 11, and manuscript):

> A number of bamboos of equal length were laid parallel on the ground and bound together by three or four lashings at intervals along the length, each lashing being wound three or four times around all the bamboos. The raft was then supported on an improvised trestle. Boys sat underneath and others on top, and they threaded a string in each interstice between the bamboos and made a couple of tight turns around the upper and lower lashings. In this way a sort of flexible raft was produced which was prevented from collapsing by the string around the transverse lashings in each interstice between the booms. Sides were then built up of two or three bamboos, and short bamboos were laid across the ends to prevent the waves from coming in; it was thus rectangular in form and did not come to a point at either end. No outrigger was attached. It could carry a number of men, but when the water began to come through the raft no more men got on.

Such rafts were used for short sea journeys, as from Lembinewen to Benaur. These were the only craft used by the natives of South-West Bay until about 1895.

Layard gave me the following names for the craft of South-West Bay: canoe, *nawangk*; the old large canoe, *nawangk timbwow*; washstrake, *neso*; bow, *nimbong nawangk*; stern, *nembr nawangk*; port, *divsing dilmeir* (left-hand side); starboard, *divsing barangen* (right-hand side); seat, *na-ai simbrsimbr*; boom, *niwinci*; connectives, *niwin langalangk*; float, *nesem*; washstrake, *neso*.

Speiser (1923, pl. 63, fig. 1) gives a photograph of a south Malekula dugout canoe with rounded ends (fig. 14):

> A flat, horizontal, triangular shelf projects from the bow. There is a gunwale pole. The three booms, apparently evenly spaced, are at the aft end and converge on the off side of the hull. Below them and extending across and to a short distance on each side of the hull is a platform of longitudinal bamboos. This is supported by transverse poles (as in fig. 13, *a*, *b*). A

longitudinal bamboo (or two) is fastened above the lateral ends of the platform. Each attachment essentially consists of two pairs of undercrossed sticks; of each pair one stick is more or less vertical and is placed in front of or behind the boom, and the other is longer and slants from before backward.

East Coast

Deacon wrote a few manuscript notes about the *nuangk wala* in use from Port Sandwich northward:

The dugout was hollowed with great labor from the trunk of a tree with very hard wood. The sides were raised by planks of breadfruit tree sewn with cords of twisted coconut fiber and the holes were calked with breadfruit juice. The booms of the single outrigger were made from saplings of the *Calophyllum inophyllum*, which wood, owing to its circular grain, can stand a great strain, for these vessels were built for strength. The two bamboo "masts" [spars] were so stepped in sockets in the floor of the hull that they projected over the sides of the canoe, but generally one was more or less upright, and between them a sail was hoisted by means of ropes [this is what Deacon wrote, but it seems probable that the sail was permanently fastened to the two spars as elsewhere in the New Hebrides]. The sail was triangular and was made of a large number of pieces of the leaf-sheath of the coconut palm sewn together. When hoisted, the apex of the triangle pointed downward and the concave base was stretched between the tops of the spars. To furl the sail the spars were unshipped and brought parallel and close to each other.

The sail is a variety of a primitive form of spritsail similar to that which was formerly used in New Zealand. One spar which, as Deacon noted, may be more or less vertical, though apparently this is not common, functions as a mast, its forked foot being stepped in the canoe. The other spar also has a fork at its foot which embraces the stem of the fork of the other spar (mast) and thus corresponds with the jaws found on so many booms in this part of the world.

Somerville (1894, p. 375), who visited the east coast of Malekula between Port Sandwich and Port Stanley in 1890-91, says that the rig of the Malekula canoes is different from that of the sea-going canoes of the archipelago:

"The picturesque matting sail is here still in vogue . . . There is no mast, properly speaking, but each of the horns of the sail is supported on a longish pole (sometimes of bamboo) like a double lateen, the feet of which are lashed to form a cross. A fore and aft thwart is lashed to two of the transverse ones, and upon this the jaws thus formed ride; the whole concern of sail and spreaders being supported by guys, and can be dropped either on one side or the other as desired, or lowered quickly altogether . . . The large ones [canoes] have usually a carved conventional figure intended to represent a sea-bird's head and breast, painted green with black borders and white dots, lashed on to both ends. A long heavy tassel of fibre . . . hangs from the bow, and with it in a long string, the jaws and tushes of several pigs—the relics no doubt of the launching ceremony. All down both the outside edges of the sail long graceful fringes hang down, with extra large bunches at the two tips."

Goodenough gives the name *nuanka* for the Port Sandwich canoe (1876, p. 358). Hagen and Pineau (1889, p. 314) give for the Fooa tribe of north Malekula: canoe, *nouaka*; sail, *abana*; paddle, *naboo*.

Cultural Drifts to Malekula

It is not here possible to discuss the racial or cultural history of Malekula, but there is good evidence, as Deacon shows (1934, pp. 608-711), for cultural drifts by way of the northernmost New Hebrides.

A most important culture was brought by five brethren, the Ambat, Hambat, or Kabat (often referred to as if there was one only), who introduced certain sacred societies, some of which had distinct grades. In the most sacred corner of the sacred grounds is found pottery, mostly in fragments, made by the coiled process. The pottery is attributed to Ambat and is used in fertility rites. The existing people do not know how to make pottery (see Layard, 1928, p. 210 ff.). With the Ambat are also associated sacred stones (standing stones, stone

tables, etc.) and geometric designs drawn on sand (Deacon, 1934). In the south this cult also includes deformation of the head and the making of effigies which contain the skull of the man who is represented.

We may accept it as certain that the immigrants came in large outrigger canoes. The canoes of the cultural stream that came to the south and southwest of Malekula evidently had undercrossed connectives, whereas the canoes of those who came to the northeast coast apparently had several pairs of oblique parallel connectives, a figurehead carved in bird form as a prominent feature, and at least two strakes on each side of the dugout. It is worth noting that fragments of sacred pottery, quite different from the pottery of the southwest, occur in the extreme northeast of Malekula.

There can be no doubt, as Deacon noted, that Ambat (Kabat) can be identified with Kwat (Qat) of the Banks Islands (Ikbat in Motu). The verbal transformation is entirely in accord with the rules governing phonetic change and the general character of the two is reasonably similar.

In the northern New Hebrides there is a Tagaro mythology which is the counterpart of the Kwat-Tangaro mythology of the Banks Islands. In the "Small Islands" off the north coast of Malekula, Tagaro is known as Tahar (Layard, 1928, p. 219) and Deacon refers to Tagar in north Malekula, which region has a special character of its own.

As Codrington long ago pointed out, there is no doubt that Tangaroa of the Polynesians is the same as Tangaro of the Banks Islands and Tagaro of the New Hebrides.

THE SMALL ISLANDS

Off the northeast coast of Malekula from north to south are the "Small Islands": Vao, Atchin, Wala, Rano, and Uripiv.

Vao

Speiser (1923, p. 250, pl. 31, fig. 4; pl. 64, figs. 1, 3, 4, 7, 8, 16), who visited Vao in 1910, gives good illustrations of Vao canoes and fittings.

A Vao canoe for eight men is 9 meters long and half a meter at greatest breadth; the float is 5 meters long and 5 meters distant from the hull. The three booms are irregularly placed, the first only a little in front of the middle of the hull, and both the others are close together at the aft end. The float, as a rule, is on the left side of the hull. A small boat for one man is 2.5 meters long, the float 2 meters long and 1.5 meters from the hull. On the gunwales are longitudinal poles and on these are bound the booms. On the right side the booms project about half a meter. Occasionally one finds a short stay (in Speiser's pl. 64, fig. 7, this is a pole which is attached to the middle boom where it rests on the right gunwale and crosses obliquely to be attached near the middle of the aft boom). Speiser describes the sticks of the attachment as crossing over and under the booms (1923, pl. 64, fig. 7), but his illustration (1923, pl. 31, fig. 4) shows that the arrangement is the same as that at Atchin. The sticks are lashed together above and below the boom. Commonly there are washstrakes, 15-29 cm broad. Between their lower edge and the gunwale of the hull is inserted a lath of soft wood over which the tying is made. The binding is not calked.

In paddling, the men sit in the canoe on small boards almost on the bottom of the hull.

The sail, which is a simple kind of Oceanic spritsail, is made of the leaf sheath of the coconut palm, sewn with bast fiber. It is triangular, with a concave upper border; the sides are 3 meters long and each is furnished with a bamboo spar in the lower end of which is inserted a stick of wood which is forked below. One fork rests on the edge of the canoe and that of the other on the stem of the fork of the former spar. Three coconut-fiber lines are attached to each spar. From one spar a line goes to the aft boom, a second to the fore boom, and the third to the bow. The other spar must remain mobile and the sailor hauls the lines according to the wind. The canoes travel swiftly with the wind. The outrigger is to windward in a strong wind, and to prevent overturning a man is placed on the float. Sometimes a large coconut palm leaf is erected in the canoe when a sail is lacking. The bailer is of the Oceanic type.

Speiser notes two peculiarities of the Vao canoes: 1, in the fore part of the prow are small transverse boards like small seats, which have no significance for navigation, but are merely the expression of the *suque* rank of the owner—the

higher the rank the more the boards; 2, a prow ornament in the form of a bird "is carved singly or doubly," according to the rank of the owner (1923, pl. 64, figs. 1, 3)—a right jealously held; it is a great insult to damage one of these, and people who broke one off have been killed.

Layard has given me the following terms for Vao canoes: canoe, *nuak*; float, *nasam*; boom, *newu*; washstrake, *nerev*; sail, *nagamban*; figurehead, *naho*.

Atchin

The following information is mainly taken from the catalog prepared by Mr. John Layard for the Cambridge Museum to describe the models he gave to the museum, and supplemented by numerous photographs. There were two kinds of Atchin canoes: 1, the ordinary coastal canoe (*na-ak*) (fig. 15, *a*), still in every-day use for crossing over to the mainland and for short journeys up and down the coast; 2, the large sea-going canoe (*na-ak* or *na-ak wala*) (fig. 15, *b*), for trading voyages and for ceremonial expeditions to Santo, Oba, Ambrym, and other islands within a radius of about 80 miles. The sea-going canoes have now gone out of use, and European whaleboats are used instead.

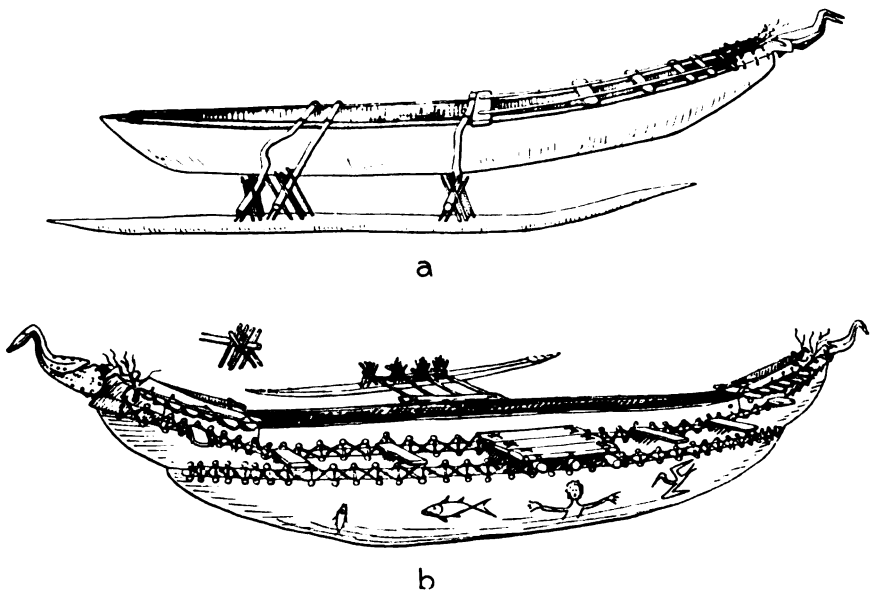

Figure 15.—Canoes of Atchin, northeast Malekula: *a*, coastal canoe (*na-ak*) with *solub wok-wak* figurehead (after a photograph by John Layard); *b*, large sea-going canoe (*na-ak wala*) and connectives, drawn from photographs by John Layard and a model (Cambridge Museum) made especially for Mr. Layard by a trustworthy native who had often sailed in such craft.

1. The hull of the coastal canoe (*na-ak*) slopes up much more gently at the fore than at the aft end (fig. 15, *a*). In most canoes a thin pole runs along the whole length of each edge of the dugout, or more commonly just below its outer border, over which the booms are laid. An upper gunwale pole extends from the bow to the thwart in front of the fore boom and is tied over the thwarts. There are no thwarts aft of the fore boom, but forward of it they continue up to the bow. The thwart contiguous to the fore boom serves as a seat, as may those that immediately follow; these are not made fast directly, but are clamped between the upper and lower gunwale poles and are prevented from shifting by the lashings which pass fore and aft of them through holes in the hull and over both poles. At the narrow fore end

of the hull and on the bow-piece the thwarts are of no practical use but appear to have a decorative ritual significance. A magic *ni-lak* root is made fast on each side to the fore end of the upper gunwale poles. In the sea-going canoes these roots are fastened to each end of the canoe, as either end may go foremost.

The figurehead (*solub*) is lashed on the fore end of the hull of the smaller canoes. In the ordinary bird figurehead (*solub e res*) (fig. 16, *b*), to which anyone has the right without payment, the slit, representing the mouth of the beak, ends at the first bend. A figurehead in which the slit is continued down the neck is called *solub wok-wak* (fig. 16, *a*), and the right to this has to be bought from someone already possessing one. When a man gets on in years he feels the need of something superior to a plain *solub wok-wak* on his everyday canoe. He then goes to one whose figurehead is decorated with a pig or other figure and after having arranged a price one of the parties to the negotation will make a copy of it. There is a third

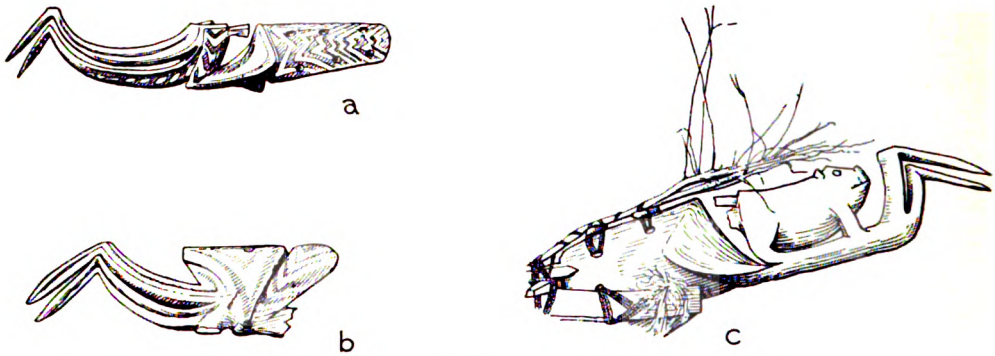

FIGURE 16.—Figureheads, Atchin canoes, northeast Malekula: *a, solub wok-wak; b, solub e res; c, solub wok-wak* with a pig (after photographs by John Layard).

type (*solub war*) which resembles the *solub wok-wak* except that the tip of the under beak is reflected over the upper beak, doubtless to represent a deformed boar's tusk, hence its name.

In recent advanced forms of coastal canoes a washstrake (*wuwun*) is sewn on to the hull and the booms are lashed on to its upper edge. In some canoes a massive end-piece is fastened for some distance along the upper fore end of the hull; it may carry on the upward profile of the hull or carry it out more horizontally. A single (or double) pole, corresponding to the gunwale pole, runs along the whole upper border, and it is below this (or between them if there are two) that the most anterior of the small transverse boards are fixed. When there are washstrakes, the forked aft end of the bow end-piece is lashed to their ends so as to form a continuous structure and the gunwale poles run along it from the fore boom to the attachment of the figurehead (*solub*).

The three booms (*ne wu*) are very long. The fore one is at about the middle, or somewhat less so, of the hull, and is widely separated from the aft booms, which are fairly close together. They may be straight, curved, or even crooked.

The float (*ni-tsem*), which is usually long, is flattened on its upper surface; the ends are generally pointed, and the fore end may rake upward.

An attachment (*bwetelak*, ordinary word for "sticks") consists of three or four pairs of parallel sticks pointed at the lower end and driven obliquely into holes in the float and lashed with sennit to the booms; one element of each pair passes over and the other under the boom. The pairs usually slant alternately towards the fore and aft of the float (fig. 17).

The chief paddler sits on the flattened stern of the dugout, and, when the canoe is manned by only two, the second sits on the fore boom and the contiguous after thwart; the larger thwarts in front support baggage and food or may be used as separate seats for paddlers. Other passengers may make use of the more forward large thwarts, but this is apt unduly to weigh down the bow of the canoe.

2. The sea-going canoe *na-ak wala* (fig. 15, *b*) is double-ended and has four very long equidistant booms close together amidships. This type has two washstrakes on each side, as opposed to the coastal canoe which has at most one, but usually none at all.

All canoes are called *na-ak*: the *na* is an inseparable particle, and *ak* a variant of the Melanesian *waga* (canoe). A transitional stage is shown in the Vao word, *nu-wak*. Sea-going

canoes are also called *na-ak wala*. The word *wala* means "to run" both on land and sea. Wala is the name of the next small island, which is famous for its sea-going sailing canoes. It is therefore uncertain whether the word *wala* refers to "sailing" or to the island.

As an outrigger canoe must always keep the outrigger to windward and the direction is reversed with each tack, it is not possible to use the words "port" and "starboard". The natives speak of the outrigger side as *a-tsem* and the lee side as *tsorta*. As the normal direction of the canoe, except when tacking, is with the outrigger to starboard, the terms "bow" and "stern" and "fore" and "aft" are used in this sense.

The hull (*na-ak*) is made of a hollowed log of *mishmash* wood; the model is decorated with isolated designs of a man, a frigate bird, and fishes. The end-pieces (both really "bow", as the canoe is double-ended) are called *sorsor*, and consist of hollowed logs tapering to a closed point. The lower washstrake is called *ne-rev*; the thwarts, *ni-sel*; and the booms, *ne-wu*.

The float (*ni-tsem*) is plano-convex and slightly raked toward the fore end, thus resembling a single-ended canoe. At either end, in the model, is a series of broad, flat notches. Each of the four booms is connected with the float by three or four pairs of parallel sticks; each pair slants in an opposite direction to its neighbor, as in the coastal canoe. To prevent chafing, a piece of the leaf-sheath of the coconut is laid around the boom before the connectives are lashed to it.

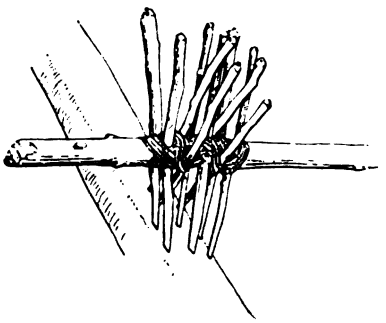

FIGURE 17.—Connectives of an Atchin canoe, northeast Malekula (after a photograph by John Layard).

Planks are attached to the booms on both sides of the hull to form two platforms (*ne retserets*). The booms are further braced by three stringers (*bwetelak*, "stick"), one at the outer end of each platform and a third a short distance inside the outrigger attachments.

The lower washstrakes, thwarts, and outrigger apparatus being in place, the main upper washstrakes (*wuwun*) are put on, shaped to fit over the inner ends of the end-pieces, and these slope upward; the line is continued by the addition of small end-washstrakes (*wuwun sorsor*). Contiguous to these on bow and stern are the main frigate-bird figureheads (*solub*). Behind these are the fore and after platforms (*nembal*) made of small transverse planks. These are secured by narrow lateral boards placed edgeways, the ends of which in certain canoes are carved with subsidiary figureheads representing the small bird called *pwerepwere*. These subsidiary figureheads apparently entail the sacrifice of a gelding tusker (*tamauw*), in contrast to the tusked boar sacrificed for a *solub*. Stems of the *nilak* plant, pulled up by the roots and with the roots forward, are made fast, for magical purposes, alongside the subsidiary figureheads.

The attachment of the washstrakes to the hull and to one another is made by means of holes (*met mbo*) bored adjacently in the upper and lower part, by means of which the parts are laced together (*ar wiwsi*) with sennit (*no-un*). The seams are rendered watertight by being covered on either side by sticks (*toha*) or pieces of bamboo wound around with coconut husk beaten onto them to improve their density. These bound bamboos are called *ne-mang*, and the lacing passes over them in order to press them tightly against the seam.

As the attachment of the figureheads is above the water line, the *toha* are dispensed with and the strips of the leaf-sheath of the coconut (*ne-viung*) alone serve the double purpose of calking and preventing the rope from chafing.

The spars, which support the sail without need for a mast, cross at the base of the sail and are made fast to the forward outrigger boom inside the canoe.

The rigging consists of ropes (*wuluwawa*), plaited strips of the inner bark of the *wulu* tree as these are less liable to chafe than the otherwise stronger sennit used for attaching parts of the canoe.

There are six ropes. Three are attached together about halfway up each of the spars. Collectively they are called *talin na-mban* (sail ropes). Functionally they are divided into two classes. As there is no mast, of the three ropes on either spar, one (*nav*) might well be termed a "stay", for it is made fast on the outrigger side to the outer stringer and on the lee side to the notches on the ends of the booms projecting from beneath the lee platform; the two others (*revrev*), acting as sheets, are made fast respectively to the fore and after thwarts.

The sail (*na-mban*) is plaited by the women in the same way as the articles of dress. A plan of the sail is laid out with sennit on the floor of the clubhouse, and to each woman is assigned the length of material which she is to make. These strips are simply called *wew* (pandanus) and they are finally laced together by the men.

The sail is symmetrical in plan and V-shaped (the angle of the V being rather less than a right angle) with a concave upper side (fig. 18). The sides of the V are tied to bamboo spars (*na-mbu-namban*), the length of which is measured so as to equal the length of the canoe between the inner ends of the end-pieces. They are called respectively the "outrigger spar" (*a-tsem*) and the "lee spar" (*tsorta*). The body of the sail is called *dengen na-mban;* the peaks, *weren na-mban* (wings of the sail); the base at the junction of the spars, *batun na-mban* ("head" or "base" of the sail); the upper edge,*mete wetsi na-mban*; the triangular projection in the middle, *bonon* (forehead?). The attachment to the spars by pairs of loops is called *ndet*, and these are used for reefing. The sail is a simple kind of Oceanic spritsail similar to that which was formerly used in New Zealand.

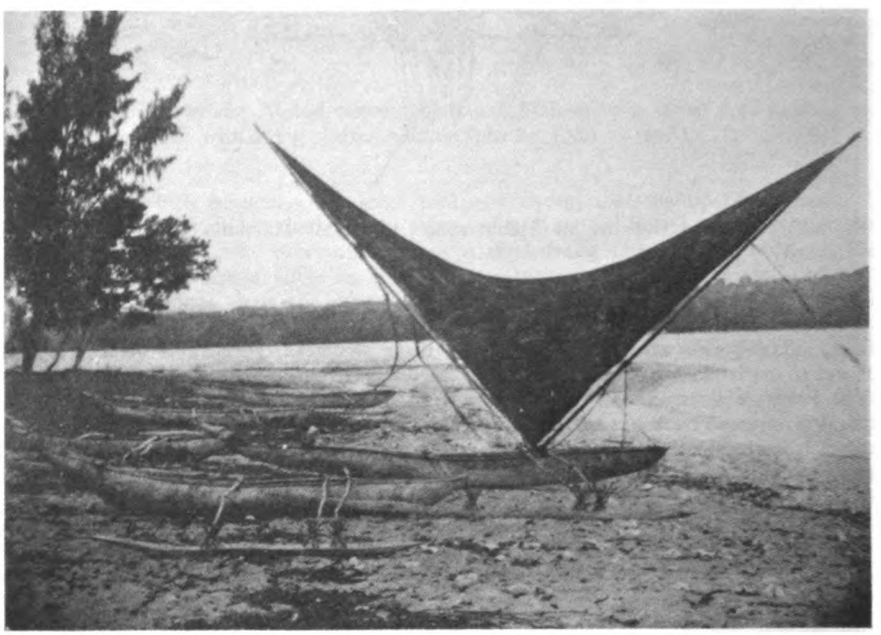

FIGURE 18.—Canoe (*na-ak*) with Oceanic spritsail, Atchin, northeast Malekula (photograph by A. R. McCulloch).

The streamers are made of the same material as the sail and are of use as bunting and partly as pennants to gage the force and direction of the wind.

The normal sailing direction of the canoe is with the outrigger on the starboard side, and when there is only one figurehead it is always placed in this sense, as in the coastal canoes. In tacking (*ra tseme*), however, it is always necessary to keep the outrigger to windward, as otherwise it would become submerged and sailing would be impossible. The direction of the canoes is therefore reversed at the end of each tack, the sheets (*revrev*) being loosened and the sail turned to the required position. This brings the outrigger on to the port side. It is not

then possible to regard the terms *a-tsem* and *tsorta* as interchangeable with "starboard" and "port", hence the adoption of the native terms "outrigger float side" and "lee side".

In a high wind, part of the crew will sit or stand on the weather (outrigger side) platform and even farther out on the boom. It is, however, sometimes necessary to reduce the area of the sail. In reefing (*ar wure*) the two bottom loops attaching the sail to the spars are undone and the sail rolled up on to the lee spar (*tsorta*) to the required amount.

Most of the paddling is done on the starboard (outrigger) side to counteract the dragging effect of the float, and the steering paddle (*no-wosh na-ak wala*) for the same reason is used on the port side.

The timber for the sea-going canoes must be obtained from the mainland. According to Layard's manuscript there are rites connected with the felling of the tree, trimming it, and the preliminary hollowing of the log, transportation to the island, the building of the canoe, and an inauguration rite. The various stages are marked by gifts of food and the killing of pigs for which sacrificial signals are sounded on the gongs.

The inauguration rite consists of: 1, ceremonial presentation of pigs by members of all the villages in rotation to the respective relatives and friends in the home village; 2, sacrifice of tuskers by the "line" (the members of a family in alternate generations: grandfather, ego, grandson; great grandfather, father, and son of ego) of the home village that does not own the canoe (these occurrences take place in the dancing ground); 3, guests and hosts repair to the canoe, pigs are slaughtered and others are given to guests. The opportunity is also taken to transact private business between hosts and guests.

Shortly afterwards the trial trip is made to the coastal villages of Atchin. The object is to arrive unseen. If successful, the people boast that they have landed unopposed, but if they are seen a man of that village throws a small dead pig into the marauding craft, which signifies defeat—the crew must sail home, eat the pig, and present a tusker in exchange. There seems to be more than a hint in this that trading voyages for pigs are apt to lead to warfare, but it does not appear that these canoes were considered war canoes.

Layard states that sea-going canoes have been possessed by the Small Islanders as long as native memory goes back, but the spectacular inauguration rite in its present form is a comparatively recent introduction. As with the *maki* and so many other rites, the first of the Atchin villages to acquire this was Ruruar. It passed by the usual method of purchase to the other villages on the island, one of which has performed it five times, and one has done it only once.

In former days each "line" of *maki* men possessed its own canoe, and the pigs sacrificed at the inauguration rites were killed exclusively at the bows of the canoe. There is a close connection between this rite and the *maki* and also the rite of gong-raising. It seems probable that in the olden days a new canoe should be constructed for each successive *maki*, as formerly was the erection of a new set of gongs. The primary use of these canoes was for the trade in pigs from other islands and the chief use of pigs was with *maki* sacrifice. A *maki* was held about every thirty years. Layard (1936, p. 350) says that in 1914 long distance canoes were obsolete, but at the inauguration of a whaleboat the old consecration rites were still continued. He was present at one such rite when over 60 valuable tusked boars and a bullock were sacrificed.

Trees large enough for the small coastal canoes are found in all the islands. The manufacture is purely a family affair. There is no dancing connected with it, and if there are any rites they are evidently of a simple nature.

According to Layard, the Atchin men employ different terms for many common words when on a long voyage: canoe, *rangot*; sail, *lola*; paddle, *walush*.

Wala

A photograph given by Grimshaw (1907, p. 211) shows that the Wala canoe is precisely like that of the other islands.

The following terms were collected by Layard: canoe, *rav*; float, *tsem*; boom, *newu*; connectives, *bwetilak*; washstrake, *merawi*; end-washstrake, *nimwel iur*; bow-piece, *musore*; lateral bow-lath, *nowala noes*; transverse boards on prow, *serser newis;* figurehead, *solub;* mast, *bu namben;* sail, *namben;* paddle, *newosh;* bailer, *norush*.

Rano

Hardy (1907, p. 177) saw on Rano three or four highly prized, very fine, large war canoes lying on the beach. Judging by their appearance, they had not been in use for a long time, nor could the natives tell anything about their history.

"The larger of the two is considerably over thirty feet from stem to stern, and the bow rises up to a height of over ten feet, and is made of a solid dug-out log curved and tapering off to a point, where evidently a figure-head of some sort has been, but now only a rudimentary bird's head remains, and suspended from the bird's neck are a pair of boar's jaws. The boat prow is ornamented and boxed and laced with sinnet. The depth inside allows more room than is usually found in like structures . . . The crew to man one of them must have consisted of thirty or forty men at the very least. The stem of the canoe is a high peaked one, curving gently outwards and elaborately carved. The outrigger [float] is an enormous log . . . They are evidently the last of their kind."

A colored plate (Hardy, 1907, p. 178) shows that these canoes were identical with the large craft of the neighboring islets. There is a washstrake and the four booms are close together; the arrangement of the attachment sticks is rather obscure, but it is evident that it follows the Atchin method. Hardy drew what he saw, but apparently did not make a careful study of the exact arrangement. Photographs in the Pitt-Rivers Museum, Oxford, show that the canoes of Rano are precisely similar to those of Atchin.

Uripiv

An illustration in "The Record" (July 1, 1920) shows a "canoe (*wala*) at Uripiv, Malekula, N. H." (fig. 19):

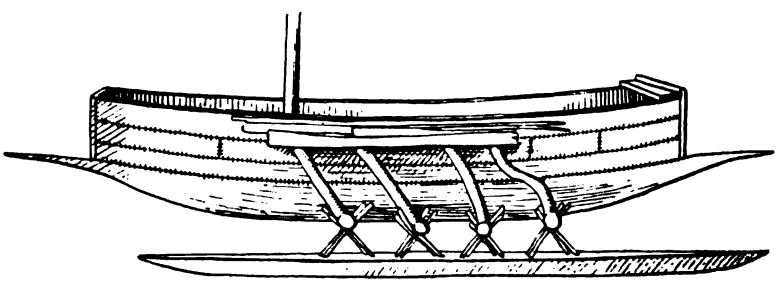

Figure 19.—Canoe (*wala*), Uripiv, east Malekula (after an illustration in "The Record", July 1, 1920).

The dugout is produced fore and aft into a long point. There are three broad washstrakes which form a long boxlike structure with square ends. Amidships there are four thick and irregular booms on which rests a narrow platform close to the superstructure; the booms apparently lie immediately below the topstrake. Each boom appears to be connected with the float by two pairs of undercrossed sticks. The very long float is canoe-shaped, with a broad, flat top. The mast and sail are of European rig. It is not certain that this is the true Uripiv boat.

AMBRYM

The canoes of Ambrym are said to be similar to those of Malekula. Le Chartier (1885, p. 230) professes to give an account of the canoes at Ambrym, but he is so unreliable that he can be ignored; for example, he describes imperfectly the canoes of San Cristoval and allocates them to Ambrym. He refers to a double canoe, but the illustration he gives is strangely like Lambert's plate of the double canoe of the Isle of Pines (1900, fig. 50, p. 265). Speiser (1923, p. 252) rightly discredits Le Chartier and adds that such craft are totally absent from the New Hebrides.

Hagen and Pineau (1889, p. 314) give for the Panti tribe: canoe, *valo*; sail, *bène;* paddle, *ouo*. Goodenough (1876, p. 357) gives *bubul* as the word for canoe.

A photograph in the Oxford Museum, "near Ambrym", shows a small dugout with a gunwale pole; the end is flat above and bluntly pointed. Two booms are very close together and widely separated from the third boom, which is placed about amidships; the connectives appear to be of the northeast Malekula type.

PENTECOST

Owing to the kindness of Miss Marion Hardacre, a former missionary in Raga district, North Pentecost, and Miss Hilda Broughton, I have seen photographs of Raga canoes. From these and from a photograph of a model (fig. 20) the following description is made:

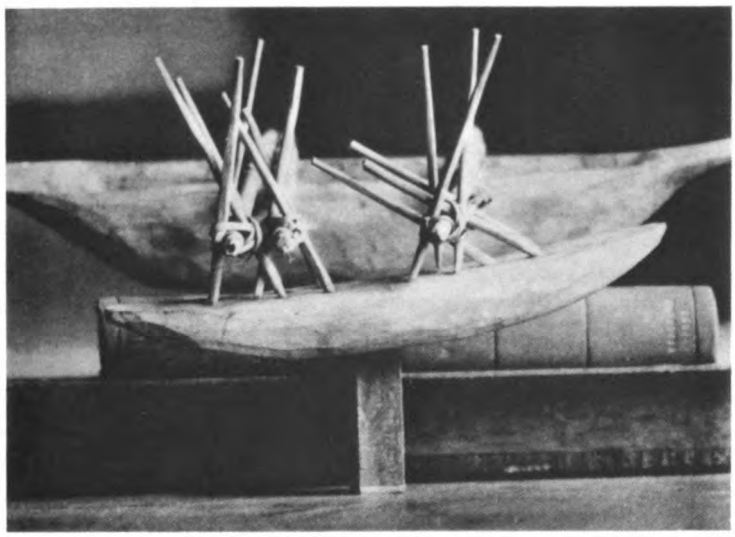

FIGURE 20.—Model of a paddling canoe (*wanga huahua*), Raga (north Pentecost), New Hebrides (photograph of specimen in collection of Miss Hilda Broughton).

Each end of the canoe (*wanga huahua*, a *wanga* that is paddled) is produced into a long, flat shelf. The three booms (*izuan wanga*, also called *bata*) are lashed over the gunwales of the hull; the two aft booms lie close together. The float (*haman*) is canoe-shaped with a flat upper surface. The attachment sticks are irregularly placed; a few are vertical, but most cross over the booms. The blade of the paddle (*vohe*) is shaped like that of an elongated spade.

Photographs of two canoes taken in the Lamatana district in the extreme north by Miss E. S. Williams, also of the Melanesian Mission, show the following characters:

The ends are pointed and there is a gunwale pole on each side which does not extend beyond the lashings of the booms to the hull; the three booms are lashed over these poles. The outrigger apparatus is nearer to the stern than to the bow; the two aft booms lie close together. Apparently it is more usual for the attachment sticks to cross over the booms, but in one attachment four pairs cross under the boom and two pairs cross over it; in another, four pairs of sticks cross under the boom and two or three sticks (not pairs) slant over or under the boom. In two attachments there are three pairs of overcrossed sticks. Occasionally there is a narrow platform of bamboos.

The canoe at Steep Cliff Bay (about the center of the west coast) illustrated by Coombe (1911, pl. p. 5) has the shelf at each end but no gunwale pole. The three booms have the customary arrangement, but the attachments are indistinct; apparently some sticks cross over the boom and some under it.

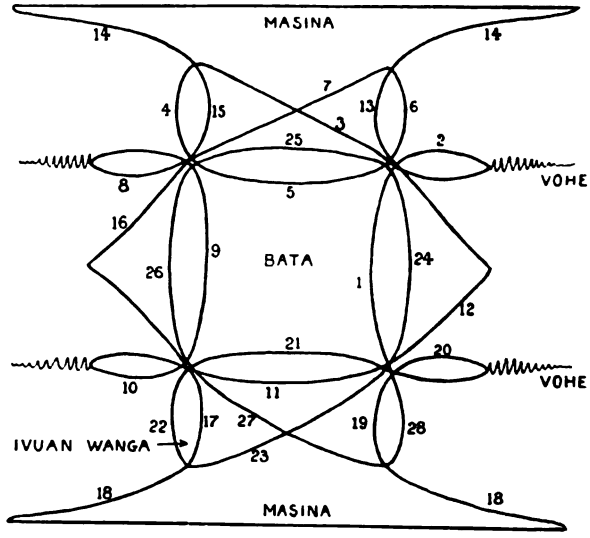

FIGURE 21.—Geometric drawing called *ruerue*, Raga (north Pentecost), New Hebrides; the phases of the line are numbered according to what is presumably the order of drawing (courtesy of Miss Marion Hardacre).

Miss Hardacre informs me that the hulls (*masina* or *masin wanga*) are made of *manara, tavva,* or *mangulungulu* trees and the float sometimes of *ove* wood. The sap of a huge tree (*bagura*) which grows near the sea is used as putty, for the sap is thick and white and hardens rapidly. Years ago, before European boats were common, very large canoes were made, perhaps 20 feet or more in length, for traveling from island to island. The sail (*gabani*), made of a number of pieces of pandanus-leaf matting sewn together, is triangular in outline with a concave upper margin. The anchor (*vatu*) is a stone (*vat* or *vatu*) tied to a length of strong creeper.

The attachment in Raga appears to combine the method prevalent in the northern islands of the New Hebrides with that in the southern islands.

Miss Hardacre sent me pencil copies by natives of various geometric designs (*uliuli*) which are drawn at the present time as a pastime on the ground, chiefly by the young people. Among them was one (fig. 21) entitled *ruerue*. The artist

described it as *wanga gairua ram bauhi bultaini-a* (canoe two they tie together them), and the parts were named: dugouts, *masina* or *masin wanga* ("real canoe", i. e., the essential part); poles connecting these, *iwuan wanga*; platform, *bata*; paddles, *vohe* (Haddon, 1934).

Thus there can be no doubt that double canoes are known of at Raga, though they are not now made there. It is not yet possible to say whether they were used at no very distant date or whether the *rueruc* drawing is a traditional one handed down from a time when the ancestors of the present population (or one element of the population) sailed in such vessels, if not actually in the New Hebrides, then in their previous home.

There is, however, an alternative explanation. A Tongan raft (*vakavaka-amei*) described by Hornell (Canoes of Oceania, vol. 1, p. 273) was a shaped raft with a log at each side, and these logs were connected by means of poles as in a double canoe. They were propelled by paddles or sometimes by means of a sail. Old people relate that these rafts were used even for journeys between Tonga and Samoa. It is also stated that rafts were the first sea craft used in Tonga. One account says that they were constructed of two great bundles of bamboo held apart and connected by several cross poles (*kiato*). Possibly both forms were employed. Comparison may also be made with the *ulatoka* of Fiji and the outrigged rafts (*mokihi*) of New Zealand. Hornell considers that rafts of this kind have a very ancient ancestry.

The Tongan raft is said to have been supported on two logs; these would make a heavy craft and the platform would be awash. If the logs had been hollowed out the platform would rise higher above the water, but then this would be a double canoe and not a raft.

As a matter of fact, Firth (1930-a, fig. 2) first gave an illustration of a *rueruc*, though he was not told what it signified. He also mentions the drawings in ashes or sand. In giving an account of some of the investigations by the late Bernard Deacon in Malekula to the British Association, Leeds Meeting, and to the Royal Anthropological Institute in 1927, I showed some drawings collected by Deacon in Malekula and Ambrym (Deacon, Wedgwood, Haddon, 1934). These are drawn by the finger on a smooth piece of ground. Usually a rectangular framework is drawn and the diagram is traced around this in such a manner that the finger is not lifted from the ground and the continuous line crosses over the framework in elegant curves until it arrives at the starting point. In figure 21 I have numbered the different phases of the line according to what I assume to have been the original procedure. I doubt if there is an alternative method, but naturally it is impossible to say where the artist actually began and finished.

The geometric designs in Malekula appear to be associated with the culture brought by the mythical brethren locally known as Ambat, but this migration to Malekula appears to have been effected in outrigger canoes as no tradition of double canoes has been recorded.

Hagen and Pineau (1889, p. 314) give for the Nineboulo tribe the following terms: canoe, *ouaka;* paddle, *foss;* and Goodenough (1876, p. 353) gives *wu-o-a* for canoe.

MAEWO

I have, like Speiser, been unable to find any information about the canoes of Maewo (Aurora). Hagen and Pineau (1889, p. 314) give for the Rangoro tribe of the northwest of the island: canoe, *ouenga*; sail, *kanbani*; paddle, *ouosse*.

OBA

Norman Hardy kindly gave me a sketch (fig. 22) of the type of canoe (*angge*) that he stated was peculiar to Oba (Aoba, Omba, Lepers Island).

The bow (*kolei angge*) is produced to form a shelf. The right gunwale is uniformly broad, so that the gunwale pole rests for its whole length upon it; the left gunwale is thin except fore and aft so that its pole is supported only at the ends, and the greater part of its length lies below the level of the gunwale though it is lashed to each boom. The outrigger consists of a single fore boom and three aft booms lying side by side and lashed together; they rest on the gunwale poles. A stringer is lashed above all the booms (*ivua*). The attachments (*batoto*) consist of two pairs of short sticks for the single boom and three pairs for the aft booms collectively; they cross under the booms and are inserted deeply into the canoe-shaped float (*sama*), which has a broad upper surface. A colored drawing of this canoe is given by Hardy (1907, pl. 62, p. 182). (See Haddon 1913, p. 627.)

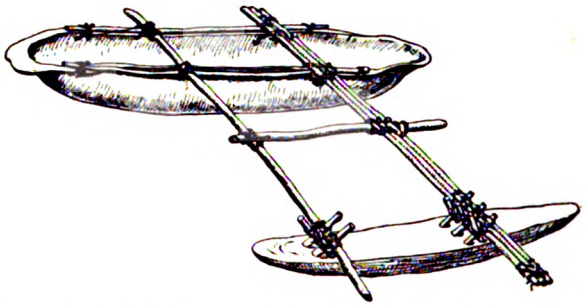

FIGURE 22.—Outrigger canoe (*angge*), Oba (Aoba), New Hebrides (drawn by Norman Hardy).

The native names were given to me by Layard, who obtained them at Lologaro village on the small side of the island. He states that at Oba the outrigger is to port, whereas at all other places it is to starboard. Other terms are: thwarts, *ambuili*; sail, *kambani*; paddle, *boasi*; bailer, *rasu*. Hagen and Pineau (1889, p. 314) give: canoe, *ango;* sail, *cambane;* paddle, *poe*.

ESPIRITU SANTO

Speiser (1923, p. 250, pl. 64, fig. 6) states that the type of canoe of Espiritu Santo is very similar to that of south Malekula, and adds on the authority of Thilenius (manuscript) that a canoe (*bilibili*) at Big Bay consists of a hull of the same name and an outrigger. (See fig. 23.)

The bow (*bilibili*?) and the stern (*zago na ubu*) project freely above the surface of the water; they are carved and bear on the upper side a flat surface which serves as a seat. Here the inner surface slopes down to the bottom of the hull corresponding with the slope of the outer surface. The cavity is generally hollowed out uniformly and is so broad that two men can sit side by side. In the middle of the hull are three outrigger booms (*watie*) that are connected with the club-shaped float by means of three pairs of undercrossed sticks (*watlango*) of equal length. The binding is done with coconut-fiber cord. In front and behind the booms is a seat (*sikesike langa*). A pole (*takavara*) stretches along the gunwale over the ends of the booms and seats. Over the booms is a movable platform (*azo na bilibili*) which consists of transverse boards held in position on both sides by a long pole (fig. 23). Formerly the hull was heightened by washstrakes.

Hagen and Pineau (1889, p. 314) give the following canoe terms for the Tikipi tribe: canoe, *aoro*; sail, *apani*; paddle, *nasoua*. Goodenough (1876, p. 362)

gives *aka* (canoe) for Cape Lisburn and the small island of Malo, and *ure* for the Bay of St. Philip and St. James.

A photograph, "facing Tangoa from Espiritu Santo," in the Pitt-Rivers Museum, Oxford, shows a small dugout canoe:

> The canoe has a bluntly pointed bow and a somewhat rounded truncated stern; behind the solid part of the bow is a transverse board. Apparently a slat is nailed on to the outside edge of the gunwale. Somewhat forward of amidships are two booms which lie side by side, both supported by the same two pairs of undercrossed sticks. About halfway from these and the stern are two booms rather close together, each of which has two pairs of undercrossed sticks. The booms are tied on to the gunwales. The float is of medium length.

Edge-Partington (1890, pl. 58, figs. 1-3) has sketched a model of a canoe from Tangoa, an islet off the south coast of Espiritu Santo:

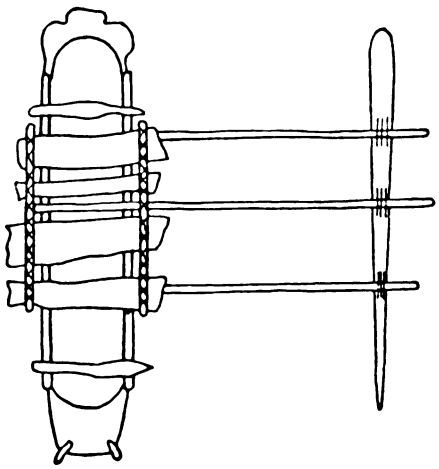

FIGURE 23.—Plan of a canoe (*bilibili*), northwest Espiritu Santo, New Hebrides (after Speiser, 1923, pl. 64, fig. 6).

> The dugout slopes up to a point at each end. The upper surface of the solid ends is flat; this triangular surface has a lateral notch and its distal portion is at a higher level than the proximal. The sides of the hollowed-out portion of the dugout are greatly elevated by means of three strakes, the seams of which are protected externally by laths. The strakes splay outward; at each end is a plain wedge-shaped breakwater which is not higher than the strakes. At one end of the upper edge of one breakwater is a notch for the steering paddle, and the notch of the other breakwater is on the other side of the hull.
>
> The five booms are rather close together amidships; they pass through the topstrakes and project some distance on the off side. A narrow plank is fastened near their free ends and another close to the hull. The booms extend some distance on the outrigger side, and two planks are laid on them near the hull. The float is short and broad; its flat upper surface appears as a bluntly pointed oval. Each attachment consists of two separated pairs of overcrossed sticks. The plaited Oceanic spritsail is triangular, one spar being much longer than the other. The steering paddle has a plain shaft and a very long, narrow blade which comes gradually to a blunt thickened point. The bailer is ellipsoid in form but of the Oceanic type with a free handle. This model bears some resemblance to the canoe from Uripiv, Malekula (p. 32).

BANKS ISLANDS

Very little has been recorded about the craft of the Banks Islands. Rivers (1912-a, p. 110) says:

"The canoe of these islands is now a far less seaworthy and useful craft than it must once have been. There are clear indications of former communications with the Torres and New Hebrides if not with more distant islands, but now the canoes only suffice for journeys within the Banks group, and are not even good enough to fulfil this purpose completely."

Mera Lava

The small canoes of Mera Lava or Merlav are stated by Speiser (1923, p. 252) to be very similar to those of Mota. The only other record known to me is a photograph given by Coombe (1911, p. 49) of a small, boy's canoe (*welewele*):

The extremities of the hull are brought to a blunt point and the fore and aft ends are covered over. There are relatively deep washstrakes with terminal breakwaters. The outer of the three long booms are lashed over the edges of the washstrakes just within the breakwaters. The central boom is nearer to the aft than to the fore one; they are crossed by a stringer. The attachment consists of two pairs of undercrossed sticks.

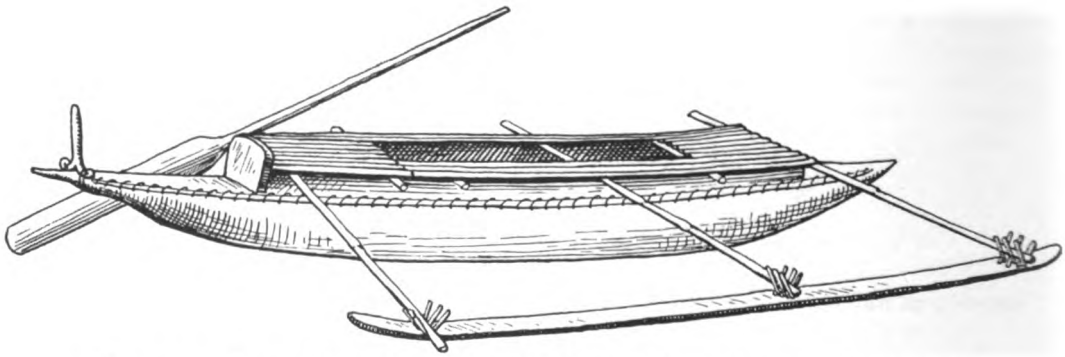

Figure 24.—Canoe (*aka*) of Mota, Banks Islands (after Codrington, 1891, p. 292).

The Rev. W. C. O'Ferrall loaned me a photograph of a canoe which differs somewhat from the foregoing:

The upper ends of the dugout are prolonged into a long, broad, flat shelf. The outer of the three slender, straight booms are lashed to the gunwales of the hull at the fore and aft ends respectively, and the third one is nearly central; a gunwale pole is lashed over the booms. The float is about as long as the hull, pointed and raked at the ends, and with a straight, flat upper surface. The attachment consists of two pairs of undercrossed sticks.

Vanua Lava

Brenchley (1873, p. 235) merely states that the "canoes are short and heavy, wide and deep, larger than those of the New Hebrides, and like the latter fitted with an outrigger."

Mota

A small Mota canoe (*aka*) (fig. 24) is figured by Codrington (1891, p. 292):

The hull rakes up to a point at each end, and a single thole pin is lashed upon the point of the stern. The fore and aft ends are covered over. The long central portion is provided with a washstrake and a breakwater at each end. Two or three poles are fastened along the top of the gunwales, and intermediate short poles form a continuous deck for some distance from the fore and aft ends of the erection, leaving a long narrow opening into the hull. The flat float is nearly as long as the hull; the three booms are attached to the ends and forward of the middle of the float; each attachment consists of three pairs of undercrossed sticks.

Codrington (1891, pp. 292-293) writes:

"The sail (*epa*) was formed of mats, woven by women, and sewn together by men with needles of tree-fern wood, or the bone of a ray's sting. The mast (*turgae*), with a forked butt, was stepped upon the midmost of the three yoke-pieces [booms] (*iwatia*) which connected the outrigger [float] (*sama*) with the hull. The yoke-pieces were fastened to the outrigger by being lashed to wooden pegs fixed into it. Upon the foot of the mast was stepped again the forked end of a boom (*panei*); both were stayed with ropes (*tali*), and in the triangular space between the mast and boom was spread the sail lashed to both, and sinking in a graceful curve between the two. A large paddle for steering (*turwose*) was tied to a horn (*tiqa-taso*) at the stern. . . . In former times the work of shaping the body of the canoe and adzing out the planks with which the sides were raised was done with shell adzes; and the holes for the lashings were bored with the columella of a volute shell. A large canoe was owned in common by several men, or by one very important person; money was paid for hire and freight. All canoes of any size had names."

Ureparapara

Speiser (1923, p. 252) says that in Ureparapara is again found [as in Api] a canoe with a stout horizontal beak (fig. 25). His photograph (1923, pl. 63, fig. 3) shows a dugout:

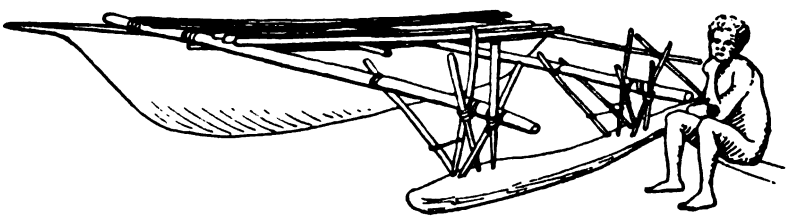

Figure 25.—Canoe of Ureparapara, Banks Islands (after Speiser, 1923, pl. 63, fig. 3).

Beside each gunwale is a pole on which the booms lie. A few poles are tied on the booms at each side of the opening of the canoe to form two narrow platforms. There appear to be three booms, one at each end of the hull and the third not quite central.

Each of the two visible attachments of figure 25 consists of two pairs of undercrossed sticks inserted into the long clumsy float. The photograph shows for one attachment an oblique stick, the upper end of which is lashed to the boom and the lower end is inserted into the float and has a lashing connecting it with the inner pair of crossed sticks. The central attachment has two shorter oblique sticks.

Torres Islands

Codrington (1891, p. 293, footnote) says:

"In the Torres Islands of late years there were no canoes; the people were reduced to use catamarans of bamboo, if they wished to cross from one to another island. Their canoe-makers had died out, and they, very characteristically, acquiesced, as at Lakona [a place in Santa Maria, Banks Islands; although this island is generally called Gaua, that term strictly refers to the northeast district only] also they did for a time, in going without."

Rivers (1912-a, pp. 109-130) discusses the disappearance of this and other arts in Oceania. He states (1912-a, p. 110) that the catamarans of bamboo "are so unseaworthy that they are of little use for fishing," but this is somewhat doubtful. Speiser (1923, p. 253) describes these rafts as parallel bundles of strong bamboos and transverse spars bound together.

SANTA CRUZ ISLANDS

From south to north the Santa Cruz Islands include: Vanikoro, the islet of Tevai is on the same reef; Ndeni (Nitendi, Ndendi, Santa Cruz Island, Egmont); the small island of Tinakula or Tamami; Matema (Swallow Islands or Reef Islands) consisting of Nupani, Anologo or Nalogo, Pileni, and other small islands. (Matema and Anologo are said by Gordon Macgregor, ethnologist of the Templeton Crocker Expedition, 1933, to be inhabited by "Polynesians", and the Lomlom—Nevelo—Islands, which include the small islands of Mohawk Bay, by "Melanesians".) Northeast of Ndeni are the Duff or Wilson Islands, of which Taumako is the largest.

The canoes are of almost the same construction throughout the whole archipelago. A good account of the craft and their gear is given by Graebner (1909, pp. 106-113) with references to the observations of old voyagers and other travelers. The small paddling outrigger canoes for two or three men are used for fishing and coastal journeys. Mr. R. H. Garvey informs me that there are four types of canoes in the Matema (Swallow or Reef) Islands. Two small types of paddling canoes are called *napekau* and *nuato*; a larger one, *numunisi*, is often rigged with a sail and it can travel much faster than the larger *tepukei*. The large sailing outrigger canoes travel between the islands and the natives sail in them to Tikopia, Vanikoro, and even to the southern Solomon Islands.

The Santa Cruz Islands were discovered by Mendaña in 1595. Quiros (Markham, 1904, p. 52) refers to the "large and beautiful canoes [at Graciosa Bay, Ndeni] with which they navigate to a long distance; the small ones only serve to go for short distances." His slight description indicates that they had then the same type of canoe as at the present time. A large canoe held 30 or more men. "The sail is large and made of matting, wide above and narrow below. The canoes are good sailers and weatherly."

Taumako was discovered by Mendaña in 1595. Quiros (Markham, 1904, p. 38) says, "The canoes were small, and some came fastened together, two and two, with frames rather high, as counterpoises, like those of the former islands [Marquesas]." This is the only account I have come across of double canoes, if they be such, belonging to the Santa Cruz Islands, and Garvey informs me that no one ever heard of double canoes. In 1606 Quiros gave a short reference to the outrigger canoes of Taumako which presumably conformed to the Santa Cruz type. He said the bows were ornamented with pearl shells, and that each canoe would hold 30 to 40 persons (Markham, 1904, p. 230).

Quiros (Markham, 1904, pp. 488, 493-494) caught at Taumako a native of Chicayana [Sikaiana] and said this native told him "that from the island of Taumaco, at three days' sail, and at two from Chicayana, there is another island, larger than the two above mentioned, which is called Guaytopo, inhabited by people as white as ours are in common, and that even some of the men have red hair, more or less, and also black . . . and that all the three islands are friendly people, and of one language." A native also told Quiros about a large ship from "Guaytopo", with more than 50 persons on board, which eventually arrived at Taumako, "and that he also saw come to his island, Chicayana, another ship of theirs, of two hulls, full of people, white and beautiful and with many very handsome girls . . . They were in all one hundred and ten persons." It does not seem possible to identify Guaytopo, but it may be noted that Sikaiana is about halfway between Taumako and Leuaniua (Ontong Java). At all events, round about 1600 there appear to have been double canoes in the southern marginal islands and they were

used by people who usually had a white skin and "red" hair. There was at that time a great deal of voyaging by the natives, and Quiros (Markham, 1904, p. 497) refers to a great pilot at Taumako who "knew the names of many countries wherein he had been many times."

The plan of a "St. Croix" canoe given by Labillardière (Atlas, 1811, pl. 44) does not appear to be accurate. The short account by Dumont d'Urville (1834-35, vol. 2, p. 139) of a Vanikoro canoe is not worth quoting. He says that the natives are inferior to the Polynesians in navigation. His illustration (1834-35, vol. 2, pl. 15, p. 118) is very sketchy and obviously inaccurate.

The earliest good description of the Santa Cruz craft is that by Dillon (1829, vol. 2, p. 277), who says:

> The canoes of Mannicolo [Vanikoro] "are formed out of the trunk of a tree as soft as deal, about fifteen or twenty feet long, through which an excavation of about six inches broad is cut, where the rowers sit with their legs before one another, and up to their calves in the hollow; the upper part being smooth, serves as the seat. All their canoes have outriggers [floats], which are placed on the weather side, connected with the vessel by planks, and sometimes by a basket-work forming a kind of platform, upon which the warriors stand to fight, and place their bows and arrows ready for use. The whole breadth of the vessel, including the wicker-work communicating with the outrigger, is six feet, the lower part being very well modelled for swift motion through the water."

An engraving of a plan of a "Canoe of the Isle of St. Croix or Indenny" (Dillon, 1829, vol. 2, frontispiece) is too diagrammatic to be of any value. It shows three booms and the "wicker-work" extending from the hull to the float.

Admiral Paris (1841, pls. 114-116) gives several beautiful and accurate drawings of craft which he saw at Vanikoro and at Tevai, an adjacent islet, which show that there has been no appreciable change for the last hundred years. His plate 116 is a spirited lithograph of a Vanikoro sailing canoe. He figures (pl. 114, figs. 7, 8) a Tevai raft of five logs of equal size which are pegged together. It has a small central or raised platform constructed on two long thin booms which are connected with the float by two pairs of primary connectives to each boom. A stringer crosses the booms at the connectives, and there are two bent rods which are fastened to the booms and inserted into the float. This is the only record of an outrigger raft from these islands.

Brenchley (1873, p. 245) visited Port Graciosa in Ndeni in 1865, where he saw

> " . . . More than a hundred canoes, with a couple of men in each . . . Their canoes are well made, and with outriggers which differ in their fixings from anything we had yet seen. There was a kind of wicker platform, which went across the canoe in the centre between the poles of the outriggers. The opening of the top of the canoes was so very narrow, they could barely get a leg into the opening, and therefore sat on the top, one leg before the other."

In referring to the Matema (Reef) Islands, Coote (1882, pp. 151-4) says:

> The canoes are as distinctive in character as the people themselves. "They are almost always built; that is, are not carved out of a single log [this is not correct] . . . They are moreover stained white, and in addition to the usual outrigger, have a counter balancing platform on the other side, on which may be carried bundles of arrows, coconuts, breadfruits, and other necessaries. Their dexterity in the management of these canoes is most remarkable . . . Drawn up upon this beach were some splendid canoes, fitted with spars and sails, and reserved for long journeys. They were over 40 feet long and were decked in, so that such cargo as they might carry could be battened down and kept from wet. Upon the platform between the main hull and the outrigger [float] was a small house in which a fire could be lighted. The sail which was of matting was of the usual heart shape, with a semicircle cut

away from the top. These vessels will not sail near the wind but attain a very fair speed when running free. The natives of Santa Cruz do not hesitate to make cruises far out of sight of land, their knowledge of the stars being very considerable."

Coote (1882, p. 153) gives a plan of an ordinary canoe and of a sea-going canoe, and a view of a sea-going canoe showing the sail. Codrington (1891, p. 293) illustrates and refers to "the large sea-going canoes, *loju*." Best (1925, figs. 129, 145, 163, 164, 164A, 164B) gives illustrations of canoes.

O'Ferrall (1903), who has long had an intimate acquaintance with the Santa Cruz Islands, states that the body of the small canoe (*jaola*) is a log hollowed out with a shell adz, and that the outrigger is always on the lee side.

"There are no bolder seamen or finer swimmers in the whole of Melanesia than in this district . . . The best builders [of the large sailing canoes], they themselves tell us, are the people of Taumako, and the Matema people have the reputation of being the most skilful and fearless sailors. The Tepukei is made upon the same principle as the small canoe, but the hollow log is calked and acts as a float to support the big stage or deck—on the stage is built a hut in which the voyagers can take refuge from the heat of the sun. The wind is caught by means of a lofty and strikingly shaped sail, which is plaited by the women (the Papuans use two similar sails for their big canoes), and the steersman uses a long paddle. Voyages are made as far as Vanikolo, and Tepukeis have even been known to make their way to the Solomon Islands. At night they steer by the stars. Should the canoe be caught by foul weather, the clumsy craft is soon broken up, and men will, when they have lost all hope of making land again, shoot one another with their bone-tipped arrows. When beached, the Tepukei is carefully covered with coconut [leaf] mats (a small canoe is turned upside down)."

O'Ferrall gives good photographs of numerous *jaola* and of a *tepukei*. In a letter (1930) he informs me that the *tepukei* are built almost entirely by the natives of the Duff Islands and bought from them by other islanders [this is confirmed by Garvey]. The hollowing-out of the log is still done with the adz made from the giant clam. There is a small sailing canoe (*nuatapu*) which is not very common. In a smaller canoe than the *jaola* the log is not hollowed out; it is only used for fishing close to the shore, and is called *nuñatapu*. The staging of the canoe is made of *Hibiscus* twigs (*mumia*).

The following note concerning the building of a canoe was translated by O'Ferrall (1904, p. 225) from a native account:

"Only some men may dig out canoes; those whose ancestors dug them out. When a father is near death, that father takes water and washes his son's hands, and they think that the father is giving to his son understanding and wisdom to build canoes, and he signifies it through water. When a man has finished a canoe he takes it down to the sea and paddles very far, and makes it roll on the surf, and then he thinks he drives away the ghost from the adze with which he dug out the canoe, and the ghost of the spot where he cut down the wood for the canoe."

Speiser (1913, pp. 292, 301), who visited Ndeni in 1910, says that the canoes here are much better built than in the New Hebrides, where any crooked trunk is used, with no idea of straightening it.

In Ndeni the boats are made with symmetrical lines and beautiful, extended ends. The upper opening of the trunk is commonly quite narrow so that one leg must be put before the other and one sits on, not in, the canoe; thus in the high sea the canoe is less likely to get water-logged. In the New Hebrides the outrigger has three booms and can not be removed. Here there is a wonderful system of booms and sticks which combines the greatest simplicity with the greatest stability. The booms join on to two pieces of wood which fit into the hull and when in use are lashed on and support a small platform for cargo, food, and weapons. Thus the outrigger is easily removable and is always taken off when the boat is not used for some days; it is carried into the shade and covered with palm leaves. Canoes can be seen all

along the shore in front of villages. The natives take a great pride in the upkeep of their canoes and often rub them with a mash of pounded calcareous algae, which makes them white like plaster when dry, and they remain so. Canoes are made only in certain villages; indeed, most industries are hereditary in certain villages and families.

A large canoe of the Matema Islands ("Riff Inseln") is made of a huge trunk and is decked so that it can not fill. Passengers do not sit in the body of the boat but go on the bridge connecting the hull and float; this is 1.5 meters above the water and can at necessity carry 40 people. A hut is built on it for shelter from the rain and for sleeping in. Such craft are propelled in the first place by a sail made of palm bast; it is two-pointed with beautiful curved lines. The sail can be fastened to both ends of the boat so that every wind may be utilized, but it is impossible to sail against the wind. The sail is very light and can be taken down without trouble. Steering is done with a long broad-bladed paddle. The appearance of these boats is very pleasing and they are as safe as a European cutter.

Speiser gives additional information in a later paper (1916, pls. 90, 97, 98, pp. 189-191).

The large sailing canoes are not made at Ndeni ("Nitendi"), as the natives scarcely have occasion to leave the island, for it supplies practically all they need. The few importations (more particularly girls to serve as village prostitutes) are brought to them by the Matema (Reef) Islands and Duff Islands people, who are the real seafarers of the group. The best canoes (*tepukei*) are those of the Duff Islands. The small canoes at Ndeni are made locally. A specialty of the canoes of Ndeni is that the outrigger is not permanently fastened to the hull and can be easily removed. [But Garvey informs me that at the present day the simple outrigger is not usually taken off when the canoe is brought inshore. As to the larger canoes, which are all made in Taumako or in the Matema Islands, the outrigger is occasionally unshipped in Ndeni when the canoes are brought into shelter from the sun.] The two balks of timber which support the platform are very accurately fitted in their position on the edge of the hull, the elasticity of which holds them fast. In the interior of the hull are two transverse bars to which the balks are bound with strong coconut-fiber line. The position of the outrigger has no significance in the large sailing canoes, but one generally sees the outrigger to windward. The sail can be placed at either end.

The Matema Islanders undertake great voyages in their sailing canoes, but the Ndeni people in their paddling canoes generally make coasting trips or at most go to Tinakula.

The paddles (*nave*) have long oval or lanceolate, slightly ornamented blades and long simple shafts (Graebner, 1909, p. 111, fig. 41), though Graebner notes that crutch grips have been reported. There are two forms of bailers, one of Oceanic type (with the handle projecting inward) and the other with the handle projecting outward. The outward-projecting handle may be carved to represent a bird, but usually it is simple. The under surface of the scoop is painted in the manner characteristic of these islands (Graebner, fig. 42).

DETAILS OF CONSTRUCTION OF TYPICAL CANOES

The following account of the Santa Cruz craft is based on the descriptions and illustrations already noted, and those in Graebner (1909, pp. 106-112, figs. 23, 39-42) and Coombe (1911, pls. pp. 171, 172, 197), on numerous photographs, including 58 taken on the Templeton Crocker Expedition (1933), and on 10 models. It must be borne in mind that there are variations in detail.

The sides of the hull of all canoes are slightly bulging and each end rakes up gradually to form a point. The top of the body is flat and straight. The hollowing-out is undercut so as to leave a slitlike opening bordered on each side by a flange, the gunwale flange; thus there is a flat surface on each side along the whole length of the slit.

The ends are left solid. The upper surface of both ends is flat, and a flat transverse bead is cut in relief from which a median longitudinal bead runs diminishing in size to the point of the hull (fig. 31). The distal half of this triangular upper surface slopes gently upward; the sides of the flat triangle project laterally to form a narrow ledge (fig. 32), and on its

under side where the slope begins there is occasionally a downwardly projecting knob (figs. 31, *d*; 33) or there may be a tassel instead. Occasionally the ends of the transverse bead are provided with a fringe tuft. Close to each end of the slit is a served line of sennit which is fastened to the gunwale flange as a strengthening brace to prevent splitting, its ends often provided with a tuft. In a large sailing canoe a cleat, usually carved to represent a bird, is lashed to one side of the slit at each end of the hull where the solid part begins (fig. 32). Before the canoe is taken on a long voyage the slit is plugged by small pieces of wood so as to make the hull completely watertight, or there may be a continuous decking on each side of the well at the fore and aft ends of which there may be a socket for the stepping of the sail. There are no washstrakes or end-pieces.

The outrigger apparatus is usually amidships, but photographs of the smaller canoes show that in these it may also be placed well aft of the center of the hull. Speiser (1913, pl. 90) illustrates one from Ndeni, as is also seen in other photographs.

The following native names were given me by Mr. R. H. Garvey and apply to the canoes of the Matema (Reef) and Duff Islands. He says that the word *tealo* for canoe is common to the whole area, but the Matema Islands term is *numuisi* (pronounced "numunch"). The following terms were collected by Gordon Macgregor on Nalogo Island: canoe, *vaka*; boom, *kiato* or *lakau fakalava*; connectives, *vaka tu* (?) or *fakatu*; float, *ama*; platform, *faele*; offside platform, *matai*; outrigger platform, *papa*; bent rod, *kamafu*; stringer, *kilikau*; lashing, *kafa*; paddle, *hoe* or *foe*.

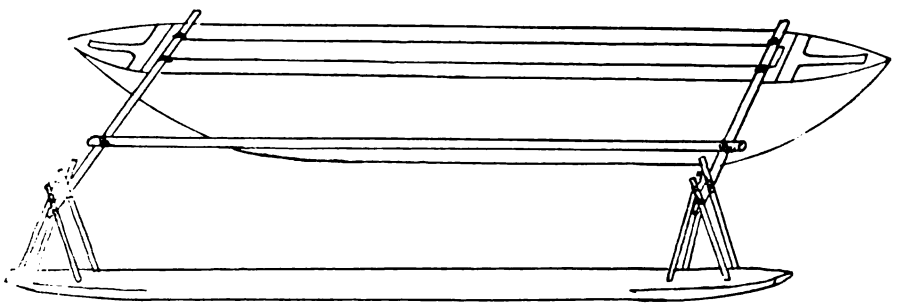

FIGURE 26.—Model of a canoe with an unusual type of outrigger apparatus, Manambalue district, Ndeni, Santa Cruz Islands (Cambridge Museum).

Mr. R. H. Garvey gave to the Cambridge Museum in 1932 a model of a Ndeni canoe from the Manambalue district (fig. 26). The hull (*alata*) and the hold (*napwande*) are of the normal type, but the two booms (*numunde*) are placed near the ends of the slit and rest on the gunwale flanges to which they are fastened. Distally they are attached to the float (*undamu*) by the usual two pairs of overcrossed connectives (*wao*); there is a stringer (*nolapunglu*) across the center of the booms. This is the only example known to me of this type of outrigger in the Santa Cruz Islands.

Photographs taken in 1933 at Mohawk Bay show a small canoe with a similar fore-and-aft disposition of the booms, but in this canoe the booms are fitted on to the hull in much the ordinary manner and are kept in position by a lashing which evidently is fastened to a toggle. There is a double float.

The typical apparatus consists of two booms (*ruopwa*) which project a short distance on the off side and to a very much longer distance on the other side (figs. 27, *a*, 28). They are so shaped that the deep portion of each fits on and into the hull and is kept in position by being lashed to a stout stick or toggle (*nivcka*) that is jammed up beneath the under surface of the gunwale flanges (fig. 27, *b*). A short vertical or slanting board (*tematai* or *temwatai*) rests closely

on each gunwale flange and connects the two booms, thus forming a well which opens into the hold (*nupanuna*) of the hull and is the only access when the slit of the hull is covered over. Each board is lashed to the booms and to the platform board.

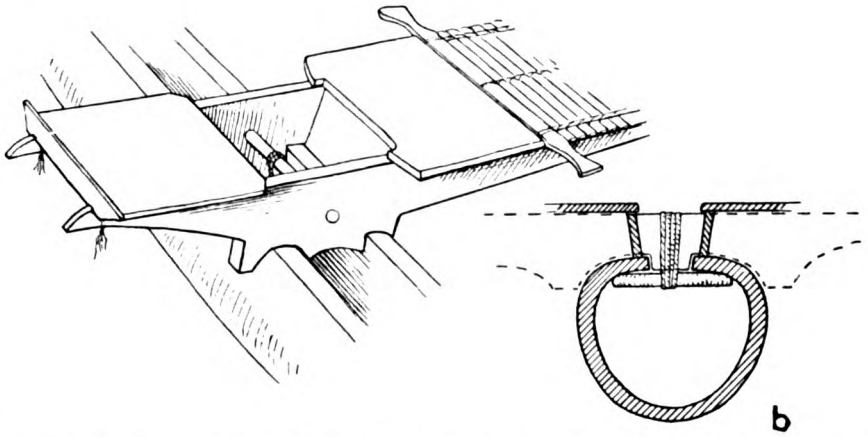

FIGURE 27.—Canoe models, Santa Cruz Islands: *a*, platforms of a small canoe with an unusual method of fastening the booms to the hull with a central toggle; *b*, section showing typical method of fastening a boom to the hull (Cambridge Museum).

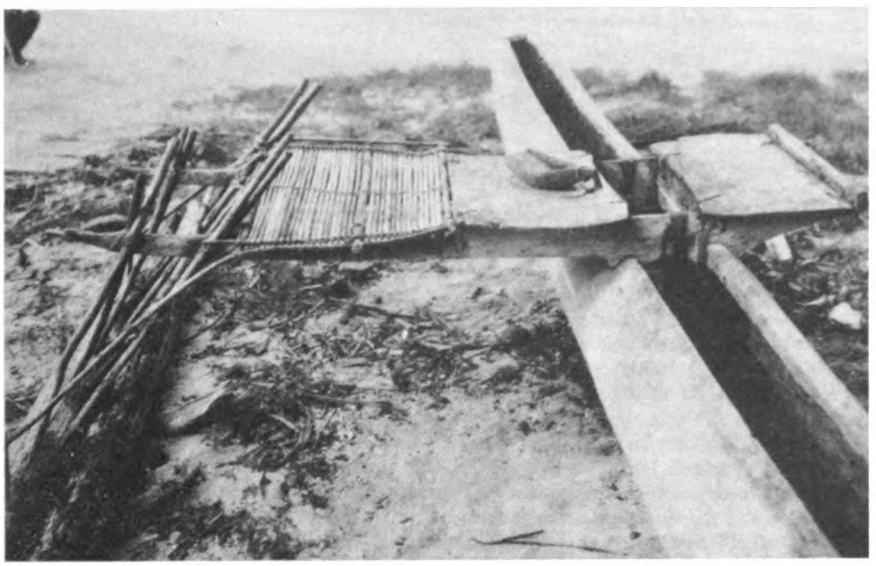

FIGURE 28.—Small canoe (*numunisi*) at Mohawk Bay, Matema Islands, Santa Cruz, showing platforms, attachment of booms to hull, and bailer (Templeton Crocker Expedition, 1933).

A horizontal board platform (*nie*) (figs. 27, *a*; 28) is fastened on to the booms on the off side and at its outer edge a small vertical board (*numbua*), or a short stout pole, is also tied to the booms.

A broader board (*topapoa*), or two boards, is fastened on the proximal part of the booms beyond the outrigger side of the well. Distal to this is another platform (*ninginea*), the "wickerwork" of the older writers, which is composed of an inner, a central, and an outer longitudinal pole; these are firmly lashed to the booms (figs. 27, *a*; 28). The central and outer

poles are prolonged beyond the platform to give support to the bent rods. Between these longitudinal poles are longitudinal laths or rods which are kept in position by being lashed to a transverse lath or pole that runs over their ends and those of the poles; there may be a similar one on the under surface. Usually this platform is further supported by a central transverse pole, halfway between the booms, to which all the longitudinal elements are fastened; the proximal end of this pole usually extends underneath the board platform and rests in a notch in the upper edge of the board of the well.

In the large sea-going canoes (*tepukei*) (fig. 32) of the Duff and Matema Islands the two booms are so massive as almost to lose the form of booms. They appear more like long balks of timber that support the platforms high above the water, though they preserve their function as the essental elements of the outrigger apparatus.

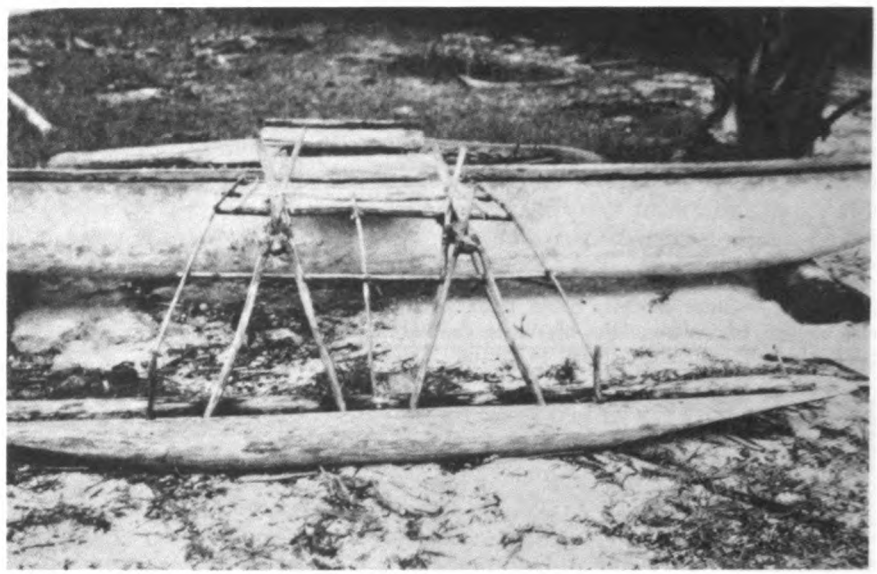

FIGURE 29.—Small canoe (*numunisi*) at Mohawk Bay, Matema Islands, Santa Cruz, showing outrigger apparatus (Templeton Crocker Expedition, 1933).

On the off side the booms project for some distance and many have a concave lower border. A broad vertical board with a concave lower edge fits on the booms near their ends (figs. 30, 32), and at each end of the top of the board a long pole is lashed which projects far beyond the vertical board and slants down to the outrigger side of the well where it rests on and is firmly lashed to a boom; these form the main support of the slanting off-platform. In a very large model (fig. 30), and in some real canoes (fig. 31, *a*) the platform is composed of longitudinal laths. At its outer and inner margins is a strong pole and another nearer the hull is slightly separated from the inner pole. A thin transverse pole is sometimes tied across the ends of all these to keep them steady; they are further supported by a central transverse pole parallel to the slanting poles; the laths are tied to these three poles. Support is also given by two stout poles that rest on the vertical board and extend over the hull, so that their other ends rest on the outrigger board platform (fig. 30), but (in the model) only the separate innermost stout longitudinal pole of the off-platform is lashed to them. These two poles thus pass along the fore and aft ends of the well and here each is connected with a pole thwart or toggle in the hull by a long lashing, in which is a stick which acts as a tourniquet to tighten the lashing and so to keep the platform apparatus and the booms fast to the hull. It is on this slanting platform that the steersman stands working an extremely long steering paddle (fig. 32).

On the outrigger side of the hull, as seen fore-and-aft, the booms project as elongated attenuated isosceles triangles, the free end of which ends in many canoes in what appears to be a bird's head.

The outrigger platforms of these canoes are similar to those of the small canoes but constructed more solidly. In one large model (fig. 30), beyond the broad board, the outer plat-

form consists of transverse laths. These are supported by longitudinal poles that run across the booms, two below the proximal end of the lath platform, one in the center, and a fourth at the distal end; the third and fourth project well beyond the platform so as to form supports for the bent rods and indirectly for the outer poles of the attachments. The central portion of the outer lateral edge of the board platform is cut to form a broad notch and there is a corresponding notch in the lath platform; thus the central part of the strong innermost longitudinal pole is left exposed, to which the shroud is fastened (fig. 30). Between the booms and under the longitudinal poles is a transverse pole as a further support to the platform. In this model, and probably in real canoes, a lashing is tied from one boom to the other at their centers and also at the center of the off portions of the booms. These lashings are provided with a tourniquet stick to tauten them and thus prevent the booms from diverging.

Over the whole extent of the outer platform a hut is built when a long voyage is intended. It is made of sticks and leaves. The outer sides are triangular and the flat roof slopes down to the booms and extends slightly over the walls and rather more so at the open end which faces the hull (fig. 32).

The outrigger attachment (fig. 30) is rather complicated, but it can be resolved into several elements.

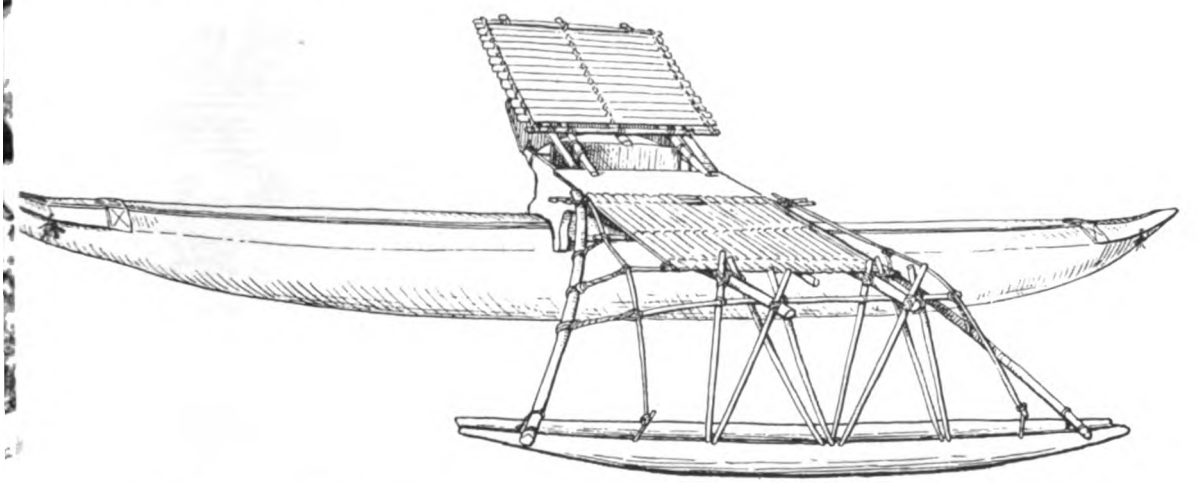

FIGURE 30.—Large model of a *tepukei,* Matema Islands, Santa Cruz (Cambridge Museum).

Each of the two straight booms (*nuopwa*) is connected with the float by two pairs of long stick connectives (*tepekatu*) which usually cross over the boom. One pair diverges from the other. These may be termed the "primary connectives".

Fore and aft of these is a bent rod (*samapu*), the lower end of which is usually fastened to the end of a short vertical stick (*tepekatu*) which is inserted into the float. Sometimes the bent rod is a branch from the vertical stick. In some small canoes the bent rod is inserted directly into the float. The upper portion of the bent rod is fastened to the ends of the longitudinal poles of the lath platform and usually extends as far as the board platform.

A horizontal stringer (*opoalu*) running well below the straight booms, from one bent rod to the other, to which it is tied, lies on the outer surface of the inner connectives and in the largest canoes is tied to them. In some models the stringer is tied only to the central sticks of the inner connectives and in other models to none of them.

In the large sailing canoes (figs. 31-33) two long, straight or slightly curved outer poles are lashed close to the ends of the float; in one photograph the poles are lashed with cane to the inner float and with sennit to the outer float. The proximal end rests on and is lashed to the stout innermost longitudinal pole of the lath platform. Usually served lashings connect these outer poles with the ends of the stringer and with the ends of the outer and central longitudinal poles of the lath platform. Photographs show that the outer poles may be fastened to the ends of a longitudinal pole, lashed to and beneath the booms some distance behind the connectives. These two poles may be regarded as supplementary, their function being to

give increased rigidity to the whole structure; they are lacking in all the smallest canoes, though they may occur in a light form in some *jaola*.

The parts of the apparatus may be strengthened by various braces and lashings. A vertical stick from the float sometimes supports the end of each boom. A central stick is frequently

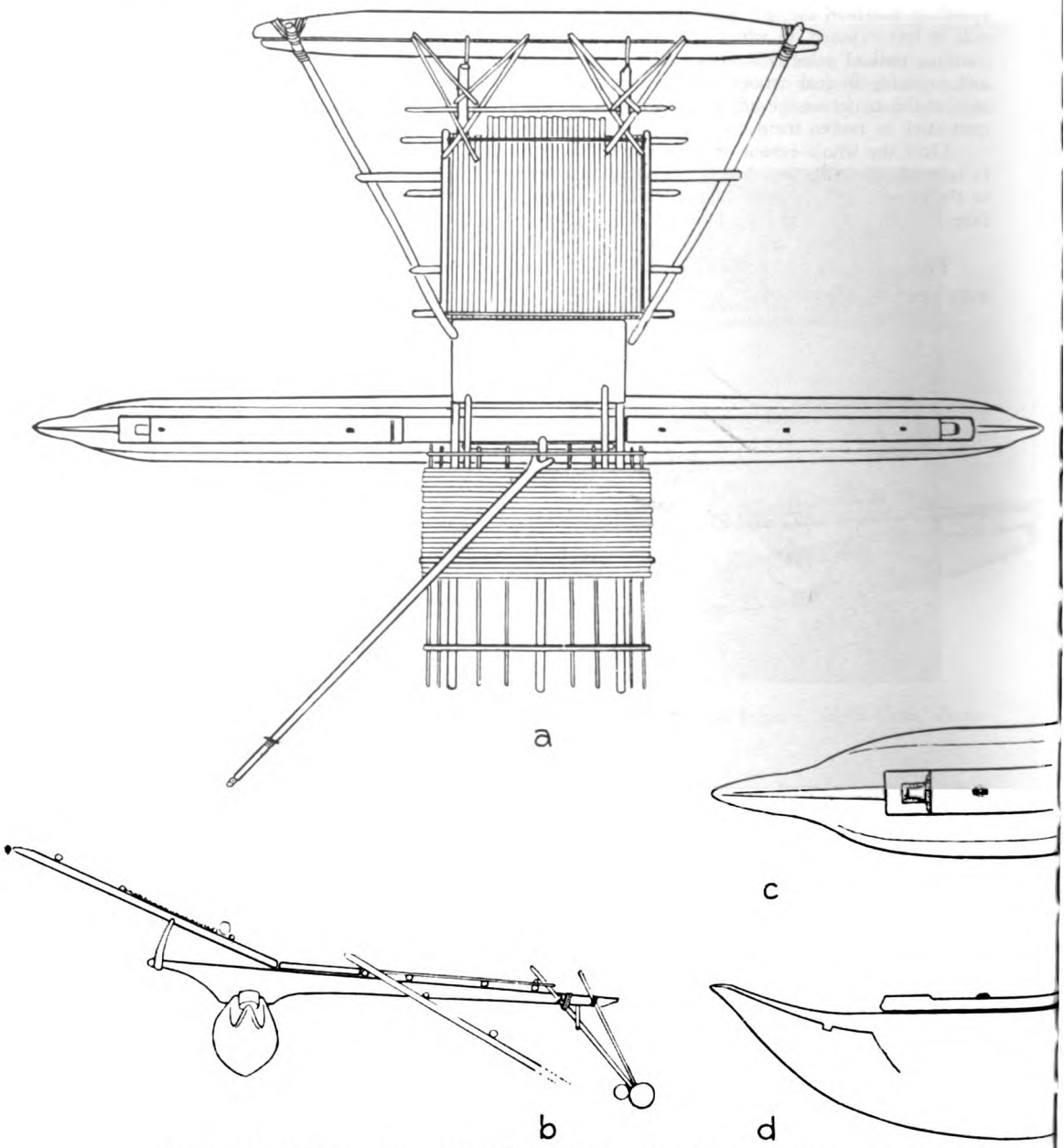

FIGURE 31.—Sailing canoe (*tepukei*), Mohawk Bay, Matema Islands, Santa Cruz; *a*, plan showing stepping of mast and socket at each end of decking for yard at foot of sail; *b*, elevation from the bow, only proximal part of fore outer pole shown; *c*, upper view of bow showing longitudinal bead and socket for sail at the end of the decking; *d*, side view of bow showing the downward projection from the lateral ledge (drawn by Toshio Asaeda, Templeton Crocker Expedition, 1933).

inserted into the inner float; it is tied to the stringer and to the end of the central transverse supporting pole of the platform. There may also be vertical sticks (inserted into the inner float in models) to give support to one of the sticks of the inner pair of connectives.

The float (*naapwe*) is short and stout and slopes up gently to the squared ends; the upper surface is flat. In some of the larger paddling canoes and in the large sailing canoes there are two similar floats, but the inner (*me-elo naapwe*) is slightly the smaller; their apposed surfaces are flat and they are lashed together near their ends (figs. 30, 31, *a-b*). Gordon Mac-

FIGURE 32.—Sea-going canoe (*tepukei*), Matema Islands, Santa Cruz (photograph by J. W. Beattie).

FIGURE 33.—Sea-going canoe (*tepukei*) with Oceanic lateen sail set, Mohawk Bay, Matema Islands, Santa Cruz (Templeton Crocker Expedition, 1933).

gregor says that when the two pieces are fastened together the upper surfaces make an angle of 30 degrees facing each other; the float makes less drag on the water when set in this position. Graebner (1909, fig. 39) figures the curved outer poles lashed to the outer float, whereas all the connectives appear to be inserted into the inner float, and on this he bases his deduction that the outer float serves to protect the outrigger against any kind of impact. In the *tepukei* shown in figure 32 there is a smaller supplementary float, or fender, on each side of the true float. The connectives are attached to the outer float when there is a double float.

All the foregoing essential elements appear in the large sailing canoes, but there is considerable variation with regard to the braces. In the smallest canoes there are only the connectives and the bent rods, but frequently a stringer from one bent rod to the other passes between the outer and inner pairs of the connectives, and in the larger *jaola* there may be a stringer which is lashed to the slender curved outer poles and passes over the bent rods and between the upper ends of the outer and inner pairs of connectives and over the booms.

A characteristic feature is that the whole attachment apparatus slants upward and inward from the float (figs. 31, *b*; 33).

Each side of the large and beautiful "crab-claw" Oceanic lateen sail (fig. 33) is tied to a slender spar. The halyard is fastened to the stouter of these, the yard, at a distance of about a third or a quarter of the length of the sail from its foot. The yard is prolonged at the foot of the sail beyond the thinner spar or boom and is lashed to a cleat, or it may be stepped in a socket at the far end of the decking (fig. 31, *c*). The halyard is rove through a hole in the masthead and a sheet is fastened low down on the boom. The short mast rakes forward from the center of the hull; its forked heel is stepped on the stout central transverse pole of the off-platform close to the hull and between the proximal, marginal, longitudinal pole of the lath platform and the separate, innermost, longitudinal pole (fig. 31, *a*). One shroud is fastened to the base of the outrigger platform and the other to the central pole and outer longitudinal spar of the off-platform.

AFFINITIES OF THE CANOES

The Santa Cruz craft are unlike any others. The hulls are simple dugouts without washstrakes or end-pieces, and in these respects are similar to those of canoes from many other places, but the narrowness of the opening is peculiar and finds its nearest analogue in northern New Ireland. In the large sailing canoes the hull is little more than a float to support the large transversely extending platforms. The whitening of the canoes with lime is also a feature of many New Ireland canoes and occurs also at Wuvulu.

The connectives of the two booms are essentially similar to those found in the southern New Hebrides and Fiji. For a closer analogy of the outrigger apparatus one must turn to Micronesia, though not for the structure of the body of the canoe.

Characteristic of the Marshall Islands canoe are two straight square booms; the end of each is supported by a vertical stanchion which is inserted into the float and also into the boom. Krämer (1906, p. 416) illustrates two stanchions, one on each side of the boom, and a model in the Amsterdam Museum shows two on each side. On each side of the booms are three curved spars or accessory booms, the proximal ends of which are lashed upon a block amidships on the weather side of the hull; their free ends are lashed to the boom as in the canoes of the Ellice Islands. These canoes have a lattice decking on the booms, and on the inner half of this is a raised platform of planks. On the lee side is a larger planked platform built out at an upward sloping angle.

I have illustrated a model of a planked canoe in the Salem Museum from Nonuti, Gilbert Islands (1920-a, p. 105); a photograph of this canoe is given by Hornell (1936, fig. 252), who demonstrates that this type of outrigger apparatus is derived from the Marshall Islands:

> There are two straight booms close together amidships, the free ends of which are not connected with the float but are lashed from above on to the short stringer across the curved

spars where they bend more directly downward. The three curved spars which function as booms are not connected directly with the body of the canoe but arise from under the outrigger platform-board. Their free ends are attached to the float in the same manner as that of the Funafuti (Ellice Islands) canoes.

Hornell (1936, pp. 369, 407; fig. 204) describes and illustrates a very similar canoe from Mokil, about 90 miles east of Ponape, Caroline Islands. It also has two straight booms close together which have no connection with the float. On each side of these are two curved spars, "accessory booms" of the same type as those of the Nonuti canoe.

Hornell (1936, fig. 288) illustrates a canoe from Kapingamarangi (Greenwich Island), an atoll lying roughly midway between the central Carolines and northern Melanesia. The outrigger apparatus, but not the body of the canoe, has some resemblances with that of the canoes of Santa Cruz. The ends of the three straight booms are connected with the float by two pairs of adpressed, long connectives; the outer of each pair is vertical and the inner slants upward and inward. There are two curved outer poles or "curved struts" as in the Santa Cruz canoes.

This Nonuti outrigger apparatus, with its board platform on each side of the hull and a lath platform over the curved spars, bears a striking resemblance to that of Santa Cruz and it would be more like it if the central curved spar were absent and if the two straight booms were provided with overcrossed connectives. The supplementary platform of the Nonuti model which extends well beyond the off side and is lashed to the top of a short central topstrake is comparable with the slanting platform of the Santa Cruz canoe. It should, however, be pointed out that the Salem model differs in many respects from the modern canoes of the Gilbert Islands as recorded by Hornell (1936, pp. 345-353). Apparently at the present day the straight booms always have a forked or branched connective, which the model certainly never had. This model is so well made that it may be taken as good evidence of a type of canoe that presumably is obsolete.

Graebner (1909, p. 174) points out that one of the most interesting phenomena of South Seas ethnology is the zone of the Micronesian cultural influence which extends along the northeast border of Melanesia and ends at Santa Cruz. The chief characteristic of the influence is the weaving loom, which is lacking in the whole of Polynesia and in Micronesia is limited to the Carolines. The loom is absent from New Guinea, and in Melanesia is found only in Nuguria, Taku, Leuaniua, Sikaiana, and the Santa Cruz Islands (Matema Islands and Ndeni), where it may be regarded as a secondary spread from the Carolines. Rivers (1914, vol. 2, p. 379) adduces evidence to show that the loom previously occurred in Ureparapara and Rowa, the most northerly of the Banks Islands, and Chinnery (1927, pp. 196-201) describes and illustrates the dying art of loom-weaving by the women of Emira (Squally Island) north of New Ireland. The Oceanic lateen sail of Santa Cruz canoes also points to Micronesia. Graebner gives other evidence for this spread of Micronesian culture and states (1909, p. 178) that the outrigger apparatus of Santa Cruz has its nearest affinity not with that of the central Carolines, but with Ponape (?) and the Marshall Islands. It appears to him to be a combination of the older Polynesian form, in which the attachment of the float to the booms is by vertical sticks, and the later specific north Polynesian curved boom. He admits that the curved poles in the Santa Cruz (outer poles) and Ponape canoes and in the allied Marshall Islands canoe are not attached to the hull but to the sides of the outrigger platform. In my opinion it is doubtful if the curved outer poles are to be regarded as true booms, comparable, as Graebner believes, with the curved booms of the Hawaiian canoe.

MARGINAL COMMUNITIES IN NORTHEASTERN MELANESIA

On the southern and eastern borders of the Solomon Islands and east of New Ireland are several small islands and groups of islands inhabited by peoples who differ in many ways from their Melanesian neighbors. These are from southeast to northwest: Tikopia; Anuda (Anuta or Cherry Island), southeast of Taumako; Duff Islands; Rennell Island (Mo Ngava) and Bellona Island (Mo Ngiki), southwest of San Cristoval; [?Ndai], Sikaiana, east of Malaita; Ontong Java (Lord Howe Islands), Leuaniua, Nukumanu (Tasman Islands), Taku (Marqueen Islands), and Kilinailau (Carteret Islands), northeast of Bougainville; [Nissan (Sir Charles Hardy Islands); Tanga]; Nuguria (Abgarris or Fead Islands), east of New Ireland. (See map, fig. 56.)

Interesting information about several of these islands is given by Woodford (1916). The following account is taken from Thilenius (1902, pp. 19-37).

> These islanders are often very tall and have a variable skin color, though with a preponderance of lighter shades, copper-brown, light copper, or even lighter. The hair is curly or wavy, but varies from woolly to straight. One face will recall a Melanesian type, the fine features of another resemble those of a Polynesian chief. The culture exhibits many Polynesian traits, and in some islands is almost pure Polynesian, and the languages are also Polynesian. Apart from analogous origins, the general similarity of appearance and culture is due to peaceful trading intercourse between various islands such as from Tikopia to Sikaiana, only occasionally interrupted by war. On the other hand, the islands from Leuaniua to Nuguria have been subjected to isolated bloody raids from Ndeni [Santa Cruz], Buka, or from Bougainville.

Thilenius recognizes two groups: a southern from Tikopia to Sikaiana and a northern from Leuaniua to Nuguria, which possibly correspond to a participation of the Melanesian element in differing degree. The boundary corresponds to that which divides the people of the Solomon Islands; this boundary begins in Bougainville Straits, runs west along Choiseul, and ends somewhere near Guizo. Apart from their characteristic peculiarities, trade, and so forth, it is especially the skin color which separates the inhabitants of the northwest islands from those southeast of this boundary line. The black Solomon Islanders on Buka, Bougainville, Alu, and as far as Simbo are thus differentiated from the brown ones who live on the other islands and who seem less restricted in their commerce, which extends to the Santa Cruz Islands. The inhabitants of the southern group of marginal islands (Tikopia to Sikaiana) were in peaceful and regular commercial intercourse with the natives of Ndeni, Matema, and the brown Solomon Islanders.

Traditions are more numerous in Leuaniua and Nuguria than elsewhere; these indicate that single canoes arrived at various times and that before these settlers arrived the islands were uninhabited. Some came from the Ellice, Gilbert, and Caroline Islands, and also from other marginal islands, as Sikaiana. But the story does not end with these traditions, for the same sort of thing is still going on, though the canoes now contain men, not gods.

The Nuguria tradition says that Katiariki brought with him, or created, taro, yams, coconuts, bananas, and breadfruit; he also imported birds, especially the edible dove. In former days these doves were carried on voyages by Polynesians as living provisions. Loatu brought all the creatures of the reefs and sea. Pakea taught the making of fire by friction and the preparation of food by cooking, and so on. Other heroes introduced certain elements of culture into Leuaniua.

Probably at the time of settlement the islands had the plants whose seeds would have been carried by the sea, but specific food plants were brought by the first colonists. The weaving of mats, definitely stated to have been brought from

Tarawa in the Gilbert Islands, was introduced into Nuguria by Tepu and into Leuaniua by Amelelango. It seems to have become naturalized quickly on all the islands, for other material for the making of clothing, with the exception of *Hibiscus,* was lacking.

Ray, who has made a series of studies of the Polynesian languages of the Solomon Islands (1916-1917) and given records of the visits of voyagers and others to the various islands, states (1919-20, p. 53) that the Polynesian languages in Melanesia may be the relics either of an ancient Polynesian language which swept through Melanesia (as Churchill supposes) or of the languages of Samoans and Tongans [and others] who have drifted westward in comparatively recent times (as Thilenius shows), and he proves from linguistic evidence that the latter is the correct view. The languages show no archaic Polynesian characters such as might be expected if they were remnants of an ancient migration. Ray (Woodford, 1916, p. 53) also says that there is very little word-borrowing from Melanesian languages.

Shapiro (1933), who studied the photographs, observations, and measurements made by H. I. Hogbin, definitely shows that there is no close physical relationship between the Ontong Javanese and the Polynesians; they are distinctly different from each other. The same applies to crosses between Polynesians and Melanesians in Fiji, Tanna, and Eromanga, as well as to natives of the Solomons, Bismarck Archipelago, and New Guinea. The material from the Marshall and Gilbert Islands is too scanty to form a basis for comparison, but the Caroline Islanders give considerable evidence of a kinship with the Ontong Java population, more particularly the natives of the western Carolines. Shapiro regards the Ontong Javanese as typifying a population once more widely spread in the Carolines but which has now been overlain and undergone permutation by miscegenation with succeeding populations, and writes (p. 274):

> "Traditionally there is supposed to be a connection between the two islands [Kapingamarangi and Ontong Java] but whatever physical similarity they might once have exhibited has now been wiped out. The natives of Kapingamarangi*, unlike the Ontong Javanese, reveal Polynesian affinities. . . . Studies on the physical anthropology of the other [marginal] islands have been lacking. It may be that investigation of Tikopia and Rennell, for example, will uncover a Polynesian population." A similarity between Nukumanu and Ontong Java was found by Shapiro, though the anthropometrical data were scanty for Nukumanu.

The culture of the natives of Ontong Java and Nukumanu (which have been studied in most detail) and of the other islands requires reconsideration in the light of Shapiro's conclusions, as previous writers accepted without qualification a Polynesian origin for these islanders. The forked connective characteristic of Sikaiana, Ontong Java, and Nukumanu canoes occurs sporadically in Nissan and in Astrolabe Bay, and is distributed throughout Micronesia; the double form is peculiar to New Caledonia and the Loyalties. The weaving loom, which certainly spread from the Carolines, is found in Nuguria, Taku, Ontong Java, Sikaiana, and in the Santa Cruz Islands.

TIKOPIA

Paris (1841, p. 111, Atlas, pl. 114) visited Tikopia (Tucopia) in the *Astrolabe* (1826-29) and describes and illustrates a small outrigger canoe:

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* Kapingamarangi (Greenwich Atoll) is such an important link in migrations that the following additional references may be useful to students: ethnography, Ray, 1917-a; physical characters of the people, Schlaginhaufen, 1929; canoe, Hornell, 1936, p. 397. See bibliography at the end of this volume.

The hull is a dugout, the bottom distinctly bowed in longitudinal section. The stern ends in a thin square-ended point, the bow ends in a thin, trapezoid, upwardly projecting cutwater. A vertical washstrake is sewn onto the dugout with sennit over a narrow lath which covers the seam externally [this is the only record for a true washstrake]. The ends of the strakes are closed by a head-board and a stern-board; the proximal part of these boards is vertical and has a liplike projection to throw off the water; the horizontal distal part is slightly convex from side to side and covers the ends of the hull; the head-board is longer than the stern-board. The cutwater and the central line of the fore part of the head-board are provided with small rounded protuberances behind which is a cleat. The stern-board is provided with a median longitudinal row of three projecting knobs similar to those of Samoan canoes. The head-board and stern-board are sewn to the sides of the hull in the usual manner.

The outrigger is on the port side. The four booms are horizontal and laid athwart the gunwales; the attachment of each is by two pairs of converging adpressed stick connectives, each pair diverging from the other. Both ends of the float are pointed, and the forward end is considerably abaft the head of the canoe. The first boom is farther from the head than the fourth is from the stern. A central stringer is shown across the booms.

The paddle has a long blade ending in an attenuated point and is slightly shouldered where it passes into the shaft. The bailer is of the Oceanic pattern; the internal handle is continuous with the bottom of the scoop.

All the canoes seen by Paris were propelled by paddles, and he suggests that the cleat indicates that they also employ a sail like that of Vanikoro; he adds that they voyage as far as Santa Cruz, 60 leagues distant.

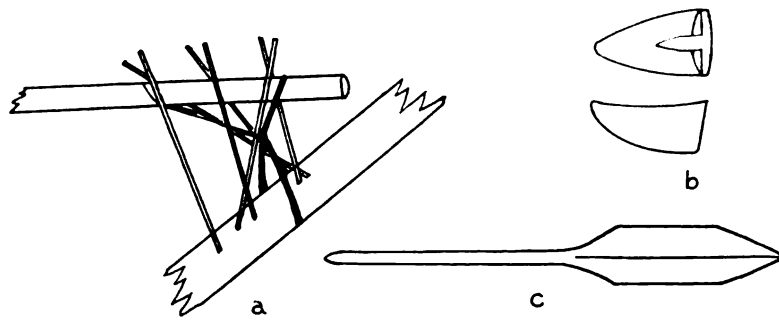

FIGURE 34.—Tikopian canoe (*vaka*) (Cambridge Museum): *a*, attachment; *b*, top and side views of bailer; *c*, paddle (drawn by C. S Lilley).

Dillon (1829, vol. 2, p. 138) states that the only craft "are small canoes that will not carry more than six men in a sea-way. They confine their voyages to Anuto [Anuda] Island, about sixty miles to windward, and Mannicolo [Vanikoro], about one hundred and eighteen miles to leeward."

A Tikopian canoe has recently been given to the Cambridge Museum by Mr. R. H. Garvey:

The lower part of the dugout bulges slightly and there is a definite edge along the bottom to serve as a keel. The upper part of the sides is cut to form a board that slightly inclines inward. This may be termed a false washstrake, as it evidently replaces a true washstrake; it is 6 inches deep and is decorated with incised triangles which are alternately whitened; the ends are cut obliquely. The length of the hull is 23 feet 1 inch; the greatest external width is 20 inches, and the opening is from 13 to 15 inches in diameter; the depth is about 1 foot 5 inches.

The solid portion of the bow beyond the head-board has flat sides, a short proximal flat upper surface, and a broad vertical fish-tail. The solid portion of the stern is longer than that of the bow and on its median line it has 21 small pyramidal knobs which decrease in size; the aft extremity is not so much like a fish's tail.

The head-board consists of a solid board 3 feet long. The thick aft end is sloped to fit onto the false washstrake and has a flat triangular upper surface which is raised above the

triangular forward boardlike portion, the proximal part of which slopes up gently on each side to a very slight median ridge from which 15 pyramidal knobs project; as these become smaller the distal upper surface becomes flat. The head-board is pegged onto the hull by four treenails. The aft decking is very similar; it is 3 feet 3 inches long; its upper distal surface slopes down gently from the higher flat, triangular proximal surface; it bears 11 pyramidal knobs. The head-board and stern-board extend about 4 or 5 inches over the solid ends of the hull. The seams are calked.

The three (rarely there may be four or even five) straight booms are 6 feet 6 inches long and there is a bamboo stringer halfway across their length. The float is a rounded log 16 feet 1 inch long and 7 inches in diameter at the middle; it runs up to a blunt point at each end. Each attachment consists of two pairs of divergent overcrossed sticks and a pair between them; all the sticks slant upward and inward from the float, as in Santa Cruz. At the middle is a suspensory brace or lashing consisting of five or six braids of sennit, which is tied around the float (fig. 34, *a*). This is the typical arrangement, but the outer pairs of connectives may not diverge from each other and the central pair may be parallel and adpressed to the boom.

The paddles (fig. 34, *c*) average 5 feet 9 inches in length and the blades average 2 feet 8 inches in width. The bailer (fig. 34, *b*) is of the Oceanic type and is 16 inches long; the free handle is 8 inches long.

Six photographs given to me by Mr. Templeton Crocker (fig. 35) confirm the foregoing description, as do the illustrations by Rivers (1914, vol. 1, pl. 47) and Speiser (1913, pl. 97). A few one-piece dugouts with two booms are used by single fishermen.

FIGURE 35.—Tikopian canoes (*vaka*) (Templeton Crocker Expedition, 1933).

Rivers (1914, vol. 1, p. 326) gives an account of the social aspect of canoe-making. The canoe-makers may belong to any division and the occupation is hereditary, usually patrilineal. There is no formal instruction and nothing in the nature of apprenticeship. He gives the following terms: canoe, *vaka*; dugout hull, *ora*; washstrake added to a small canoe, *fono*; planking, *puke*; bow, *mata vaka*; stern, *aumuri*; hold, *riu*; boom, *kiato*; float, *ama*; connectives, *tutuki*.

Firth (1930-b), who has recently investigated the ethnography of Tikopia, refers to: 1, the myth of origin of the island and people; 2, the tale of the entry of the ancestors or ancestral gods of Kafika into the land (the *ariki kafika* holds the primacy among the chiefs, *ariki*); 3, a third set of somewhat mythical stories describing the arrival of a canoe from Leuaniua and the

creation and the peopling of the low land of Tikopia. "Coming down to more historic times, the island is said to have been then inhabited by three sets of people. The most numerous, Nga Faea, sprung from the Luaniuans, were occupying the present district of Faea, and Nga Ravenga who are said to have been white-skinned and autocthonous, occupied the other side of the island. Nga Ariki, 'The Chiefs', were the third party, and also claim *afu kere* 'soil descent'." Great changes subsequently took place and the chiefs gained possession of the whole island. He adds (p. 117):

"Native tradition states that the ancestors of the principal families came separately from various islands, Pukapuka [Danger Islands], Luaniua, Tonga, Valua (in the Banks), Samoa, Rotuma, Uvea [Wallis], and Anuta . . . Despite a Tongan invasion about eight generations ago, and other occasional contacts, the Tongan element in the population is said to be small, unlike that of neighboring Anuta, which is held to be composed almost wholly of Tongans, with a sprinkling of people from Uvea."

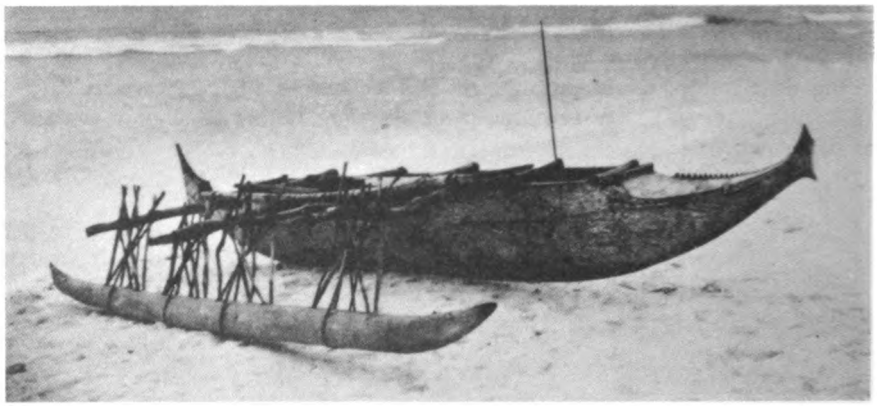

FIGURE 36.—Anuda canoe (*vaka*) (Templeton Crocker Expedition, 1933).

Firth (1931, p. 179) gives an interesting account of two youths of Tikopia who went by themselves in an outrigger canoe to Rennell, which they call Mukava.

Thilenius (1902) shows on his map voyages to Tikopia from Uvea, Rotuma, Haabai [Tonga group], and Fiji.

Rivers (1914, vol. 1, pp. 298-355; vol. 2, pp. 234-242) gives a good account of Tikopia. He says that the people must be classed with the Polynesians, though some Melanesian mixture is indicated. He states that there has been extensive intercourse between Tikopia and the Santa Cruz Islands, though the hostile nature of many visits makes it improbable that there has been much mutual influence. The culture is not merely essentially Polynesian, but it is definitely Tongan. However, Rivers considers that the Tongans did not have much effect socially and that the Tikopian culture represents an earlier condition of which Tonga is a later and aberrant form. He considers that in Tikopia is an isolated remnant of the immigrant invaders of Melanesia, and that the Tikopians may be derived from a divergent stream of the ancestors of the Polynesians when they were on their way to their new home, or may have been an offshoot of the Tongan population after this had already been settled for some time in those islands; but this view is not supported by Ray's linguistic evidence.

Speiser (1913, p. 304) gives only a short account of the island. He describes the islanders as tall, with almost light yellow skin, and thick long manes of floating golden hair.

ANUDA

The natives of Anuda (Cherry Island), which lies some 67 miles northeast of Tikopia, are Polynesian in appearance and speech, according to Friederici (1912, pp. 28, 301), their language being allied to that of Samoa and Tonga. Gordon Macgregor, ethnologist on the Templeton Crocker Expedition, 1933, was told that the present inhabitants believe they are descendants of Tongans who came by way of Uvea and the Ellice Islands without touching at Tikopia. One man stated that the Anuda people adopted the Tikopian type of canoe after their arrival, but Macgregor thinks this doubtful. The natives often swim out to visiting ships on logs; they also swim on logs and fish from them for hours at a time.

The following description of Anuda canoes (figs. 36, 37) is based on an account by Macgregor and on a dozen photographs taken on the Templeton Crocker Expedition.

FIGURE 37.—Anuda canoe (*vaka*) seen from the stern (Templeton Crocker Expedition, 1933).

The *vali* trees, from which the dugout canoes (*vaka*) are made, grow to such great circumference on Anuda that a hull with an interior depth of 3 feet can be cut out from a single log, but in some cases patch-pieces are sewn on to make the edges level; Friederici (1912, p. 301) found this to be true for every canoe. The sides (*paivaka*) of the hull are only slightly convex and taper to a narrow keel (*takele*). No washstrakes are added, but a common Polynesian name for that piece, *oa*, is applied to the upper two fifths of the sides of the hull, above the streamline and between the head-board and stern-board. This false washstrake is slightly inclined inward so as to reduce the orifice of the hold.

The solid ends of the hull are produced into narrowed, slightly rising beaks. The beak of the bow end (*matavaka*) terminates in a thin vertical fish-tail (*kautuniu*) which forms a cutwater; its concave upper edge is serrated. The extremity of the stern is more square in section than the bow and the expanded end has a kite-shaped flat surface as seen from behind.

A triangular block of wood is cut and trimmed so as to lie closely along the upper surface of the hull prolongations. These head-boards and stern-boards (*puke*) are cut into small pyramidal knobs (*pakatala*) along the median line. The inner ends of the *puke* are very thick and here they abut against the ends of the *oa*. The rim of the pentagonal, flat upper surface of the head-board is slightly undercut so as to prevent the water from washing into the canoe: the flat surface of the raised part of the stern-board serves as a seat (*tua puke*).

All the lashings are of sennit (*kapa*). Tapa-calking in the seams is called *te ulu tuta*; the sail, *la*.

Three or four booms (*kiato*) are lashed onto the gunwales, the upper surface of the parts over the hull being flattened to serve as seats. A stringer (*takau ama*) is often present halfway along the length of the booms. The long float (*ama*) is pointed and raked at each

end. Each attachment consists of six stick connectives (*tutuki*). Two pairs converge and cross over the boom and may, or may not, diverge from each other. The central pair is vertical and adpressed to the boom. The connectives are not strictly vertical, so the whole apparatus slants inward from the booms as in the Santa Cruz canoes. There is a strong brace of braids of sennit to strengthen the attachment of the float to each boom (figs. 36, 37).

In a large canoe under construction there was an additional piece in front of the headboard. It fitted onto the streamline of the bow end of the hull and also formed the upper half of the fish-tail cutwater [perhaps this was the case in the Tikopian canoe drawn by Paris]. The after-board was continued to form the stern peak, the attenuated after end of the hull being well behind it. This variation gave the canoe added length and allowed the utilization of all the broad portion of the log for the hold of the hull.

When on shore the canoes are carefully protected from sun and rain by coconut-palm leaves and mats.

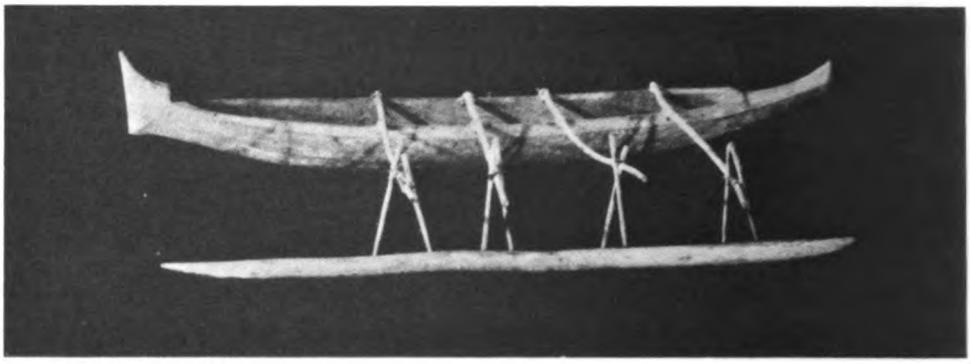

FIGURE 38.—Model of an Anuda canoe (Cambridge Museum, photograph by T. A. G. Strickland).

The Cambridge Museum, thanks to the kindness of Dr. C. E. Fox, has recently received a model of an Anuda canoe made in that island (fig. 38). It is rather roughly made and is cut out of a single piece of wood, but the general form is correct. The outrigger apparatus is placed nearer to the aft than to the fore end. There are four booms and each attachment consists of two converging sticks, but they cross over the boom at a variable distance apart. This is merely another example to show that great caution must be exercised when relying on models for details of construction.

The Anuda canoe is thus of the same type as that of Tikopia.

RENNELL

Rennell (Mo Ngava or Moava), nearly 100 miles southwest of San Cristoval, is an upheaved atoll surrounded by steep coral cliffs. In the southeast portion of the central depression is a brackish lake. Accounts of the island are given by Woodford (1916, pp. 45-54; 1890, p. 234); Lambert (1931); Hogbin (1931-a; Illustrated London News, April 4, 1931, p. 554); and Thilenius (1902, pp. 26, 28), who refers to a native of Rennell knowing the names of various islands of the Matema Islands and speaks of a connection with Tikopia and also of visitors from San Cristoval. Ray (1917-c, pp. 170-179), in addition to information on linguistics, gives a number of references to the literature on Rennell and Bellona. Hogbin sent me a few notes and two photographs of the canoes of this rarely visited and remarkable island, and Templeton Crocker has given me 30 photographs, detailed drawings, and some notes made by Gordon Macgregor in 1933, all of which information has been of great value.

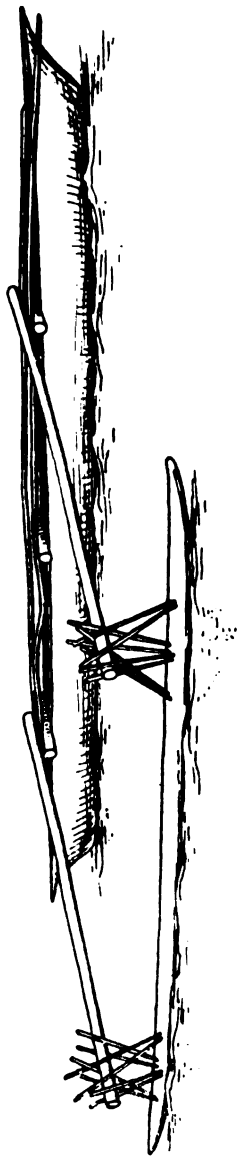

FIGURE 39.—Canoe (*waka*) of Rennell Island (after a photograph by H. Ian Hogbin).

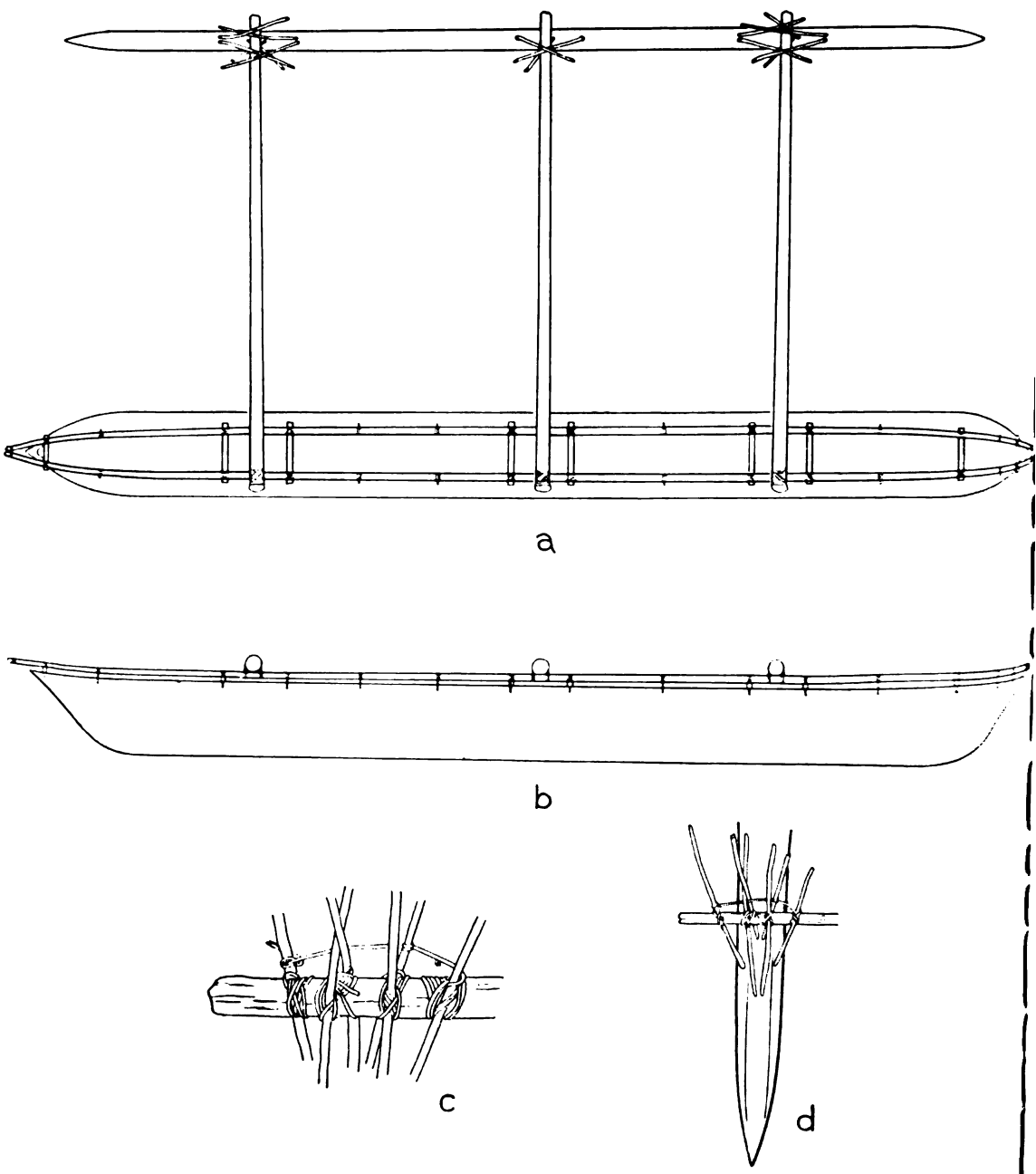

FIGURE 40.—Canoe (*vaka*) of Rennell Island: *a, b,* views from above and from starboard side; *c,* stern boom and connectives; *d,* bow boom and connectives (drawn by Toshio Asaeda, Templeton Crocker Expedition, 1933).

The small canoes (*vaka*) are very narrow dugouts, sharply raked at each end and with a slight horizontal spur (*manu*) (fig. 39). The thin gunwale pole (*lakungga*) is kept separated from the hull (*potu vaka*) by thwarts (*logguloggu*). Usually there are three booms, but the smaller canoes have two, which are widely spaced; the booms (*kiato*) rest upon and are lashed to the gunwale poles between two thwarts (fig. 40, *a, b*). The float (*ama*) is nearly as long as the hull, its pointed ends (*mata ama*) are raked.

The typical attachment consists of: 1, two pairs of sticks (*vaato*) which converge over the boom, each pair parallel or slightly divergent from each other; 2, two sticks which are inserted more to the sides of the float and below the boom, the outer one sloping upward and outward and the inner one upward and inward, the sticks being lashed to opposite sides of the boom outside the former attachment (fig. 40, *c, d*). Apparently in the lake canoes the outer stick is often absent and the elements of the converging pairs are usually parallel to each other (figs. 41, 42). In some canoes one or both of these sticks may be represented by a

FIGURE 41.—Connectives of a lake canoe, Rennell Island (Templeton Crocker Expedition, 1933).

pair of parallel sticks (fig. 39), as is common in Bellona. This is the usual arrangement for the fore and aft attachments. The central attachment is simpler and may consist of only three sticks. There are slight variations from the typical attachment, and supplementary sticks may be added.

The canoes on the lake are similar to those on the seashore, but they alone carry a platform (*hata*), which consists of close-lying longitudinal poles (figs. 42, 43). The platform extends halfway across the booms on the float side and about 2 feet over the starboard (*katea*) extension of the booms. The poles which cover the hold are shorter than the others; the first pole on the starboard side is called *katea,* that on the outrigger side, *pangge ama*; the poles lying next to the *katea* and extending over the booms are termed *kahutanggua.* The platform is supported by transverse poles (*nggumutu*) parallel to and between the booms.

Lashings are made of strips of cane (*faungga*), but sennit appears to be used occasionally for the thwarts (*logguloggu nggingga*). Paddles are called *hoe.* Canoes are also poled by saplings (*toko*).

Sails (*ngga*) are only used on the lake canoes. Hogbin saw one which was 18 feet long by 6 feet broad at the widest part; it was made of pandanus-leaf matting and supported by two sticks at the bow. Photographs taken by Hogbin (1931-a, p. 555) show an outrigger canoe and a sailing canoe. The sail (fig. 44) is pyriform coming to a narrow point below, and is not fastened closely to the

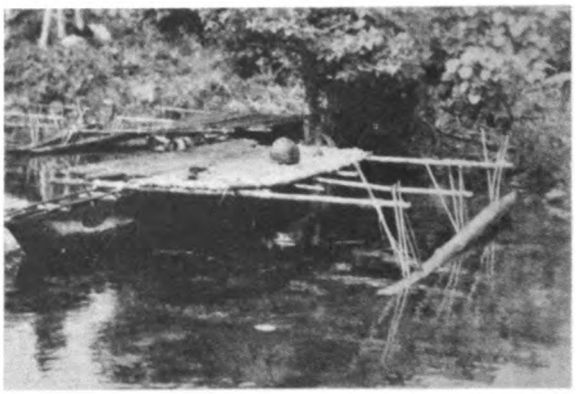

FIGURE 42.—Lake canoe, Rennell Island, showing platform and raised gunwale pole (Templeton Crocker Expedition, 1933).

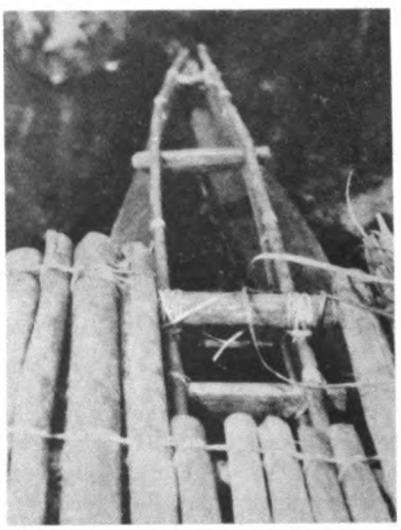

FIGURE 43.—Fore end of platform of a lake canoe, Rennell Island (Templeton Crocker Expedition, 1933).

spars. One spar is supported by a mast which is about as high as the broadest part of the sail and is steadied by a stay; no other rigging is visible. Hogbin (1931-b, pl. 4) illustrates a different kind of sail. It is extremely long and narrow, one side is straight and the other bowed; the upper end is square and the lower pointed; it is placed at an angle of about 45 degrees. The sail is but loosely attached to the upper spar, which is supported by a raked mast amidships. There appear to be a strut or mast-shore on the outrigger side and a vertical spar on the

off side, but it is not evident to what part of the rigging this is fastened. I must confess that I do not understand this rig.

Macgregor writes:

"Women are allowed to use both the shore and lake canoes. The middle seat of the shore canoe is stated by Stanley to be tapu. However, I was told to sit on it. . . . All parts of the platform [of the lake canoes] were indiscriminately used for storage or sitting. However, all people sat facing forward or facing the outrigger float, and when I sat back to it was asked to turn around. Both shore and lake canoes are paddled by two people, one sitting in the extreme bow [*mua*] with feet tucked under him, and one at the extreme stern [*munggi*]."

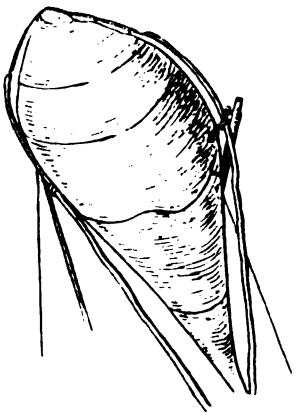

FIGURE 44.—Sail of a lake canoe, Rennell Island (after a photograph by H. Ian Hogbin).

Woodford (1916, p. 47) says that there may be some Melanesian admixture on Rennell, but the Polynesian type is certainly the predominating one; the natives at the extreme southeast end are certainly of pure Polynesian blood. He thinks that there can be no doubt that the main stream of immigrants must have been composed of strays and castaways from the Matema (Reef) Islands and perhaps from Santa Cruz (Ndeni) itself, or even may have been due to a roving Tongan or Samoan canoe driven out of its course. Thilenius (1902, vol. 1, pp. 26, 28) refers to a native of Rennell who knew the names of various islands of the Matema group and speaks of a connection with Tikopia and also of visitors from San Cristoval. He suggests that there may be a mixture of Melanesian blood from the neighboring Guadalcanal. Lambert (1931, p. 141) gives a description of the natives, whom he regards as being of the Polynesian race.

BELLONA

The canoes of Bellona (Mo Ngiki or Moiki), which lies about 15 miles to the northwest of Rennell, have not hitherto been described. Thanks to the courtesy of Mr. Templeton Crocker I have examined 18 photographs and 3 detailed drawings, which show, as Gordon Macgregor states, that the canoes are similar to those of the sea coast of Rennell, and like these have no platform (fig. 45). A matting of interplaited strips of leaf is frequently fastened between the gunwale pole and the gunwale to form a weather-screen analogous to that at Port Moresby, Papua. The typical attachment (fig. 45) consists of: 1, two pairs of sticks in the median line of the float which converge over the boom, or there may be only two converging sticks (fig. 46, *a*); 2, an inner and an outer pair of sticks, adpressed

to the boom outside the other attachment, though the arrangement varies slightly. The float is sometimes made of two poles lashed together and then only the inner pair of sticks is inserted into the inner pole. The lashings are of split cane.

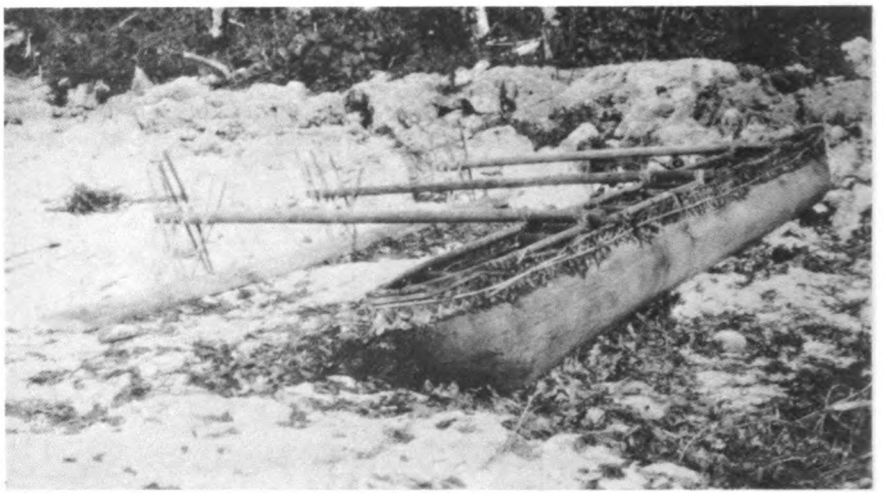

FIGURE 45.—Bellona canoe (*vaka*) seen from stern (Templeton Crocker Expedition, 1933).

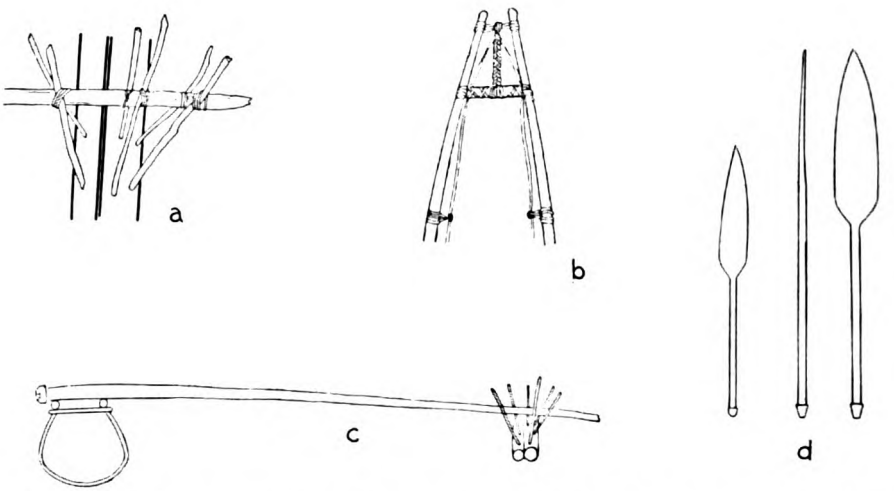

FIGURE 46.—Bellona canoe: *a*, bow boom, connectives, and double float; *b*, stern, from above; *c*, section of canoe and outrigger; *d*, paddles (drawn by Toshio Asaeda, Templeton Crocker Expedition, 1933).

The canoe terms appear to be the same as those at Rennell, though Ray (1917-c, p. 175) gives "ship, *lakatau*" (!).

In referring to the "Polynesian" communities of "Moiki" (Bellona) and "Moava" (Rennell), Churchill (1916, pp. 155-156) inclines to the view that they arrived from the "Polynesian" islands of the Solomons by the route of "the fairway between Guadalcanal and Malanta, and this fairway is the region in which we have found such distinct evidence of Polynesian loan material in the languages

of Ngela, Vaturanga, and Wango . . . Taking the Nukumanu-Liuaniua point of departure, the easterly trade-wind would offer the best point of sailing for a double canoe through the critical channel of the southern Solomons and thence to Moiki-Moava." It is not evident why Churchill mentions a double canoe. An outrigger canoe with a "Polynesian" stick attachment is now known on Guadalcanal, so we may provisionally accept this line of migration.

SIKAIANA

The following account of Sikaiana (Stewart Islands) canoes is based on the information given by Thilenius (1902, pp. 59-61, pl. 3, fig. 1), who gives an illustration of a model; on a sketch with named parts by C. M. Woodford (1912); on models in Köln, Cambridge, and Oxford; but especially on a large number of photographs taken on the Templeton Crocker Expedition of 1933. I have adopted Woodford's terms and followed them by those of Thilenius. There are two types of canoes: (1) a simple dugout, and (2) an outrigger canoe:

1. The dugout is shaped like an attenuated whaleboat, wider toward the center with more or less bulging sides. The ends come to an almost vertical sharp edge, and at the head is a prominent ridge which is perforated for the looped end of the head-rope. Within the hull there may be cleats opposite one another for the support of thwarts.

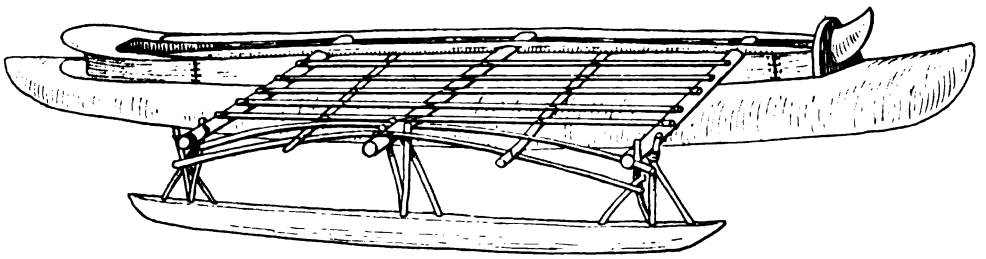

FIGURE 47.—Model of a Sikaiana canoe (*ʔaka* or *ʔaka*) (after Thilenius, 1902, pl. 3, fig. i).

2. The outrigger canoe (*ʔaka, ʔaka*) (fig. 47) is used in the lagoon and in the neighborhood of the reef. The hull is a well-shaped dugout (*ʔaka*); the upper surface of the solid ends is flattened. The washstrake (*horno, fono*), which may be composed of three planks end to end with scarfed ends, is sewn on to the hull; its upper edge is thickened to form an outwardly projecting bead (*balama*) which protects the strake from being chafed by the paddles. The long after end-piece (*pani, pane*) is also sewn on to the hull; it is rounded behind and its *balama* projects aft to serve as a seat for the steersman (fig. 47). The short fore end-piece (*pani*) is squared and is produced in front into a stout spur. This *pani* is not permanently fixed to the hull and is kept in position by means of a long lashing, one end of which passes through a perforation in the after end of the *pani* and the other end of which is tied to a transverse stick jammed against the inboard sides of the hull; photographs show that the fore *pani* is often not shipped when afloat.

The three booms (*giato, kiato*) usually pass through both washstrakes immediately below the *balama*, but sometimes they do not appear to pass through the off washstrake. The float (*ama*) is short and shaped much like the hull. The outrigger apparatus is always placed well forward (fig. 48, *a*).

Each boom has a forked connective (*hagatu, fakato*), which is inserted into the float; it is also secured by a lashing which passes through a horizontal perforation in the float; but in the central connective the lashing may pass around the float (fig. 48, *c*). The forks of the fore connective lie on the fore side of its boom and those of the aft connective on the aft side of its boom; occasionally the central boom passes between the forks of its connective (fig. 47). Usually two oblique sticks (*tugi, tongi*) are inserted into the float and slant in opposite directions to cross over the central boom to which they are lashed; one passes beyond the outside of the outer bent stringer and the other to the off side of the inner bent stringer (fig. 49).

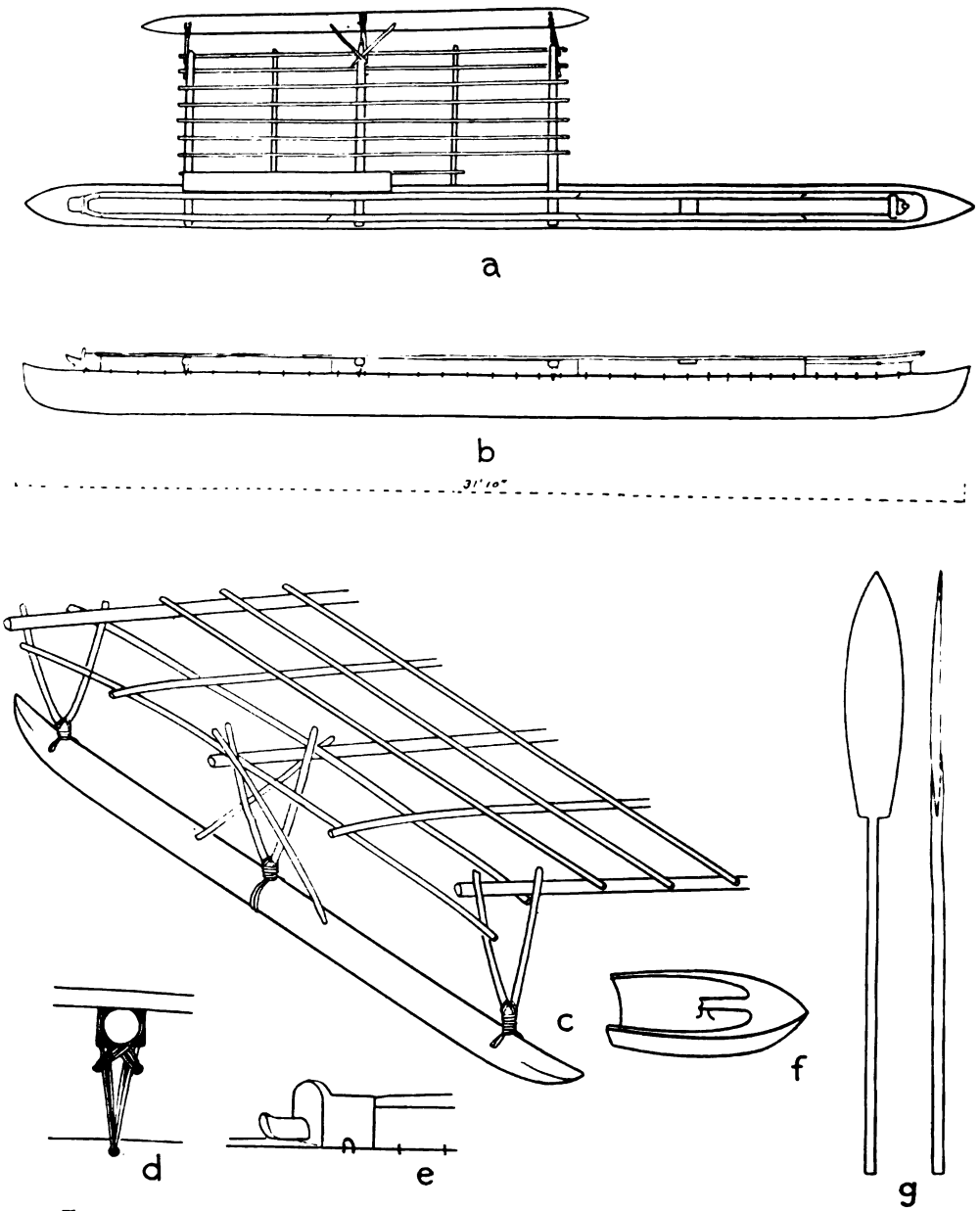

FIGURE 48.—Sikaiana canoe: *a*, *b*, canoe seen from above and from port side; *c*, outrigger apparatus; *d*, lashing of boom to hull, seen from outside; *e*, variant form of fore end-piece; *f*, bailer; *g*, paddle (drawn by Toshio Asaeda, Templeton Crocker Expedition, 1933).

Midway between and parallel to the booms are two thin spars (*kiatomoto*); lying across these and the booms to which they are lashed are five equally spaced stringers (*kauwiuwi, tanine*). Beyond these are an inner and an outer bent stringer (*halo, palo*) which pass over the central boom and under the *kiatomoto* and well below the outer booms to be attached respectively to the inner and outer forks of the connectives of the fore and after booms. A plank (*pama*) often rests on the fore and central booms close to the washstrake (fig. 48, *a*). The lashings are made of sennit.

The paddles (*hoi*) (fig. 48, *g*) have a long, plain, rounded shaft (*kau*); the blade (*lolo*) is leaf-shaped. Apparently a triangular mat sail might be used on the larger canoes, but a calico spritsail is now employed. The bailer (*edata teriu*) (fig. 48, *f*) is of the Oceanic form.

Macgregor made the following measurements: length of hull, 31 feet 10 inches; depth in center, 1 foot; average width, 1 foot 6 inches; distance between gunwales, 5.5 inches; total length of the fore end-piece, 1 foot 3 inches, of after end-piece, 4 feet; booms, 6 feet; float, 14 feet 6 inches; paddle, 5 feet 5 inches, length of blade, 2 feet 5 inches, width 6.5 inches.

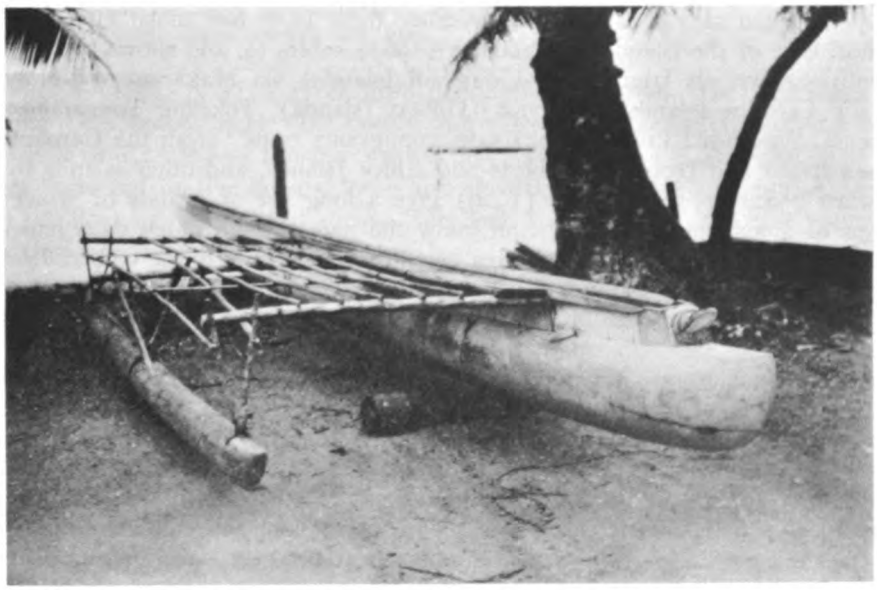

FIGURE 49.—Canoe seen from fore end, Sikaiana (Templeton Crocker Expedition, 1933).

According to Woodford, the hull is made of *pinipini,* the booms of *salahalu,* the stringers of *hau,* all trees which grow in the bush, and the connectives of *tauraura,* a tree which grows on the beach.

It should be borne in mind that models are rarely made accurately and therefore are not reliable evidence. Friederici (1912, p. 301) states that he did not see any *tongi* or *kiatomoto,* and Woodford does not refer to *kiatomoto*; the photographs show that both are normally present.

Thilenius on his map (1902) shows influences from the Ellice Islands, Samoa, and Vavau (Tonga). He says (1902, p. 28) that there is no doubt that there were friendly relations with Tikopia, and refers (p. 29) to a great invasion of Tongans, and to a boatload of Samoans who were driven on to the island about 100 years ago and were absorbed into the population. Woodford (1916, pp. 42-44) gives various additional voyages to and from Sikaiana. He refers (p. 39) to a double canoe arriving at Sikaiana about 1600, as related by Quiros. One great native navigator made many voyages in an outrigger canoe. He went on one occasion to Mala, Ysabel, and Laina, close to Choiseul, and Leuaniua, and on

another to Tikopia, Nupani (Matema Islands), Tinakula (Santa Cruz Islands), and Fenuahala, which Woodford identifies as Rennell Island. He says the natives are almost pure Polynesians, but with some admixture of Micronesian blood.

ONTONG JAVA

There are several small islands on the extensive atoll usually known as Ontong Java, Ongtong Java, or Lord Howe Islands. The name Onthong Java was given by Tasman in 1643. Its history is given by Shapiro (1933, p. 237). The largest and most densely populated island is Leuaniua (Luangiua, Lewenewa, Liueniua, etc.). (For a discussion of these names, see Poly. Soc. Jour., vol. 34, 1930, p. 386.)

There is a mixed population in which castaways have formed an element, though Shapiro says it is doubtful whether these have had much effect on the physical type of the islanders. Thilenius (1902) refers to, and shows on his map, adventitious arrivals from Jaluit (Marshall Islands) via Makarama (? Kapinga Marani, Caroline Islands), Paanopa (Gilbert Islands), Tokelau, Tongatabu, and Rotuma. Woodford (1916, p. 32) says immigrants came "from the Carolines in the northwest and from the Gilberts and Ellice Islands, and other islands to the eastward". Sarfert and Damm (1929) give a long list of islands of which the natives of Leuaniua and Nukumanu know the names or in olden days had connection in one way or another; the area extends from Nissan to the Gilbert Islands, Ellice Islands, Tonga, Samoa, Fiji, and other groups or islands. These authors also give the most complete account of the ethnography of Leuaniua and Nukumanu.

Ray (1917-a, p. 99) and Hogbin (1930-b, p. 823) have studied the language of Leuaniua. Hogbin is also preparing a monograph on the island (see Hogbin 1930-a, pp. 43, 94, 201). Hornell informs me that the names for canoes and parts suggest Samoan rather than Tongan ancestry.

The first account of the craft of Ontong Java is that by John Hunter (1793, p. 222), who says: "Their canoe was about 40 feet long; it was badly made and had an outrigger." He gives (1793, pl. opposite p. 222) an elevation and plan:

> The hull is long and narrow, bluntly pointed at each end with a distinct rake. There are 9 seats and 5 equally spaced booms, the fore and aft ones not far from their respective ends. There is a seat beside each boom. The float is nearly as long as the hull. There are 3 widely spaced stringers, the outer being over the attachments. Each attachment consists of one vertical and one oblique stick. The elevation is evidently incorrect as it shows the booms going direct to the float and the sticks standing up from the float as if forming a railing with two stringers. These drawings can not be accepted as reliable.

Mr. N. W. Thomas has kindly given me extracts relative to Ontong Java from a manuscript in the British Museum (Add. MSS. 16382 *b*) which describes a voyage in Oceania at the end of the eighteenth century:

> "Several small canoes, six with sails up, being to our thinking something of the lateen kind, were observed standing towards us. . . . One had nine hands in her. . . . Their canoes were in no one place covered, but just under the sail, which seemed made of mat work, probably narrow slips of plantain leaf of some stringy bark, and occupied a very small space . . . Their canoe was a great unwieldy thing, being between 30 and 40 feet long, and in the broadest part amidships near two feet wide, which was very disproportionate. Each end of the canoe for about four feet ceased from being hollow and terminated in a round beak, tapering almost to a point. These, which were no doubt alternately head and stern, drooped considerably and were frequently under water, which was not unoften washed from there into the canoe, occasioning them to bail out pretty constantly, which they did with

cocoanut shells and also a well shaped scoop, and to my surprise of the same construction I have seen used for that purpose in England. The workmanship was their own. Most of that space that lay between the beaks was furnished on one side with a clumsy outrigger about eight feet wide, consisting of rough spars or small limbs of trees. The largest or frame pieces might be four to five inches in diameter, the others occasionally smaller; the wood seemed buoyant. . . . This monstrous appendage was of considerable length and its use as a counter-balance . . . the outrigger being to windward . . . and a hand or two can go out and sit upon the extreme end of it . . . in form it is an oblong square . . . There appeared to be no contrivance, as in some countries, to obviate the inconvenience by giving the ends a shape calculated to facilitate its way in dividing the water. Their paddles were about four feet and used with both hands in an up and down direction, pressing the flat part with good force against the water; they terminated in a point and were ornamented with carved work. They were used on both sides, there being pretty wide spaces between the cross-pieces of the outrigger. A man at each end kept constantly steering with perhaps a somewhat longer paddle than the rest. . . . The body of the canoe seemed composed of one tree somewhat rudely hollowed out aud the upper part for several inches deep and part of the ends were strongly sewn on with tough fibres covered with gum."

Finsch (1881, p. 114) gives little definite information. He says that the Ontong Java canoes were very poorly and slovenly made and reminded him on the whole of Kusaie and Ponape construction. There was a washstrake. The outrigger consisted of five booms, loose and slovenly bound together and connected with the float by five vertical sticks. The float was as long as the hull and was a rude thin tree stem, merely denuded of bark.

Wawn (1893, p. 410), who was there in 1888, says, "Their canoes do not amount to much. They are rather small, low and light, and are only fit for lagoon work . . . The larger ones often spread a triangular mat sail when before the wind."

Parkinson (1897, p. 140) gives additional information.

The islanders of Ontong Java and Tasman (Nukumanu) have only driftwood, as the trees that grow there are not large enough to make canoes; but nevertheless they have numerous craft. The wood nearly always seems to have drifted a long way, as the planks are generally pierced by shipworm [*Teredo*], though the holes are carefully calked. If the driftwood is not large enough, then a canoe is made of several pieces sewn together, often with very different kinds so that dark and light woods are joined together. Canoes vary in size to hold only two men to those 16 meters long carrying 20. They are all of the same shape: a long hull with a straight keel and a straight edge, the ends somewhat curve in toward the keel line; some have a small deck fore and aft chiefly for the steersman to sit on. Stability is given by a float attached by several booms. There is a pandanus-leaf screen for sun or rain when women and children are on board. Many have a triangular mat sail. The natives exhibit great skill in sailing outside the lagoon in a rough sea. They may capsize, but right the canoe very cleverly.

Friederici (1912, p. 299, figs. 100-102) describes the hull (*va*) as somewhat blunt at each end.

A narrow washstrake (*hono*) is sewn on, but *Parinarium laurinum* is not employed for calking. Where the dugout has only a low depth, planks may be sewn on to rectify this; they appear like patchwork. The upper border of the dugout may be very irregular so the lower border of the washstrake is cut to correspond. One of the largest measured was 5.29 meters (19 feet, 4 inches) long, 0.45 meters (17.75 inches) broad, and 0.50 meters (19.75 inches) deep. Bow and stern are clearly to be distinguished from each other. At each there is a small removable upright board (*kau*), the one to serve as a back for the man sitting in the bow, the other for the steersman. The booms (*ieko*) are 3 or 4, or in one canoe 5, in number. The float (*ama*) appears always to lie on the left side. Each boom is attached to the float by a forked stick (*haku*), the stem of which is sunk into the float. For greater safety a long rod (*haro*) is bound over the central *haku*. Some *haro* consist of two pieces; the ends

are lashed to the float. There are four stringers (*kokoxoma*) across the booms. There is no platform. Large boats have a mat shelter in the middle. Usually two or three poles lie upon the booms. In Friederici's figures of canoes with three booms, the *haro* passes over the central boom and under the outer ones. The passing under the outer booms seems to be the normal arrangement.

Woodford (1906, p. 133) says that "canoes are made of the trunks of large trees which come adrift during the N. W. moonsoon, probably from New Ireland." He also says (1916, p. 33): "The natives are gradually giving up the use of the sailing canoe, as they are now buying European boats and half-decked cutters, but up to a few years ago the single sailing canoe with the outrigger was in general use."

Sarfert and Damm (1929, p. 195 ff.) classify the canoes of Leuaniua and Nukumanu as follows (the first native name given is from Leuaniua and the second from Nukumanu):

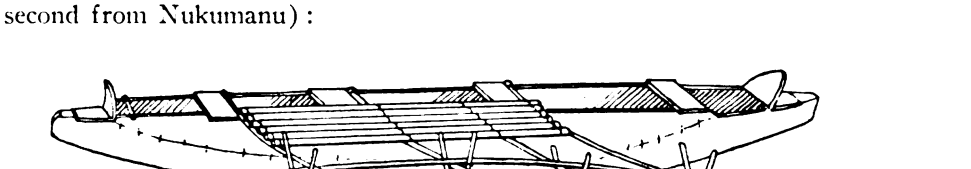

FIGURE 50.—Canoe (*papau*) of Leuaniua (Ontong Java), (after Sarfert and Damm, 1929, fig. 248).

1. *Pepe'au, pepekau*: the old high-sea canoe made of sound wood; there was an outrigger and a mast and sail. The captain (*kinohiki, tinohiti*) was endowed with all astronomical, maritime, and magical knowledge (1929, p. 206). These canoes have long fallen into oblivion.
2. *I'a'a haika 'ui vaka haitakui*: very large outrigger canoes, about 13 to 18 meters long, with a triangular sail. Thilenius (1902, 1, p. 60) gives the name *proau* for this type. Hunter (1793) saw six or seven canoes with large triangular sails.
3. *I'a'a loroa, vaka loloa*: paddling canoe, without a sail, as large as the foregoing; used for fishing.
4. *I'a'alo, vakalo* (*va'a, vaka* = canoe; *alo* = paddle): proper paddling canoe, larger than the *papau*. Friederici (1912, p. 299) refers to a "large boat", by which he probably means the *va'alo*, which had a mat shelter in the center of the canoe. Parkinson (1897, p. 141) also mentions this shelter for women and children.
5. *Papau, papau*: a small canoe, about 4.5 to 5 meters long. There are two forms: *papau solili'i, papau soliliki*, a small type; and *papau lahi, papau lahi*, a large type. It appears that this was the type of canoe that most voyagers saw when the natives came to the ships to sell coconuts.

Sarfert and Damm (1929, p. 204, fig. 248) describe the making of a canoe by experts and give a sketch made in 1910 of a canoe of the Leuaniua and Nukumanu type which shows that the dugout has a very irregular margin and that a plank is cut to fit this and preserve a straight gunwale which does not run along the whole length of the canoe (fig. 50). But according to Friederici's sketch (1912, fig. 102) there may be more than one such board; in some canoes this is a true washstrake which extends from one breakwater to the other.

The ends of the hull are solid. The bow and stern are normally cut square so as to present a flat triangle when seen endwise. At each end where the solid part begins, a breakwater (as it may be called) is erected; this is merely a small upright triangular board with a flat foot on the outer side which fits on the upper surface of the solid end of the hull. The

fore breakwater is vertical, the aft one slants backward. There are four seats alongside the booms and a thwart stick is lashed on the gunwale near the fore breakwater. The four booms are placed nearer to the fore end. The float is a simple pole and is longer than the hull. Each boom has a forked stick attachment, the short stem of which is sunk in the float and the angle tied by a lashing that encircles the float. The Y connective is tied to one side of the boom. A bent pole is lashed to near the ends of the float and passes over the central booms and under the outer booms and in all canoes between the forks of the connectives. There is a platform of longitudinal poles over the booms close to the hull.

Mr. H. I. Hogbin, who has made a study of the ethnography of Ontong Java, has been so kind as to send me the following information on the canoes of that island in advance of the publication of his book.

There are very few trees on the islands, owing to the poor quality of the coral soil, so that at least three quarters of the canoes are made from drift logs. The log, whether a tree which has been cut down or, as is more usual, drift timber, is towed at high tide to the canoe workshop and dragged into shallow water until it rests on the bottom. At low tide a ceremony is performed and the work begins. First the outer surface of the wood is removed, for it is generally sodden and useless. Then the log is cut so as to make as long a canoe as possible, and as it becomes lighter by the chipping off of more wood, it is gradually dragged higher up on the beach, where the final cutting is done in the shade.

First the outside of the canoe is roughly chipped out. Then the hollowing-out is begun. After a fair portion of the center has been removed the log is turned over and the outside is chipped again, and so it goes on till the sides are of the desired thinness—generally about half an inch—a great deal of delicate chipping is necessary. On this dugout (*ʔaʻa*) there is a ridge left to form a keel [perhaps this is a modern innovation], but otherwise it is cut so that the maximum breadth is at the top and so that it tapers toward each end, both of which are alike. The hollow only reaches to some distance from either end so that these are solid. As the edges of the hull are likely to have irregularities, so a board (*ngongo*) is added to each side, the lower border of which is carefully cut so as to fit in with these irregularities. Corresponding holes are bored in the boards or strakes and the hull; a layer of coconut fiber is laid on the edge of the dugout and the boards firmly lashed to it by means of sennit. A strip of tough palm stalk may be pushed under all these strings level with the junctions and so as to cover them, in order to strengthen the calking.

If pieces of the dugout are rotted through or strained, the affected portion is entirely cut out and a patch put in its place. This is a very difficult task and requires the hand and eye of an expert. It is lashed in exactly the same way as the *ngongo*, the holes being plugged with fiber. Sometimes a whole canoe is made like this, the hull being actually part of four or more logs. Such canoes are naturally less seaworthy, for the seams are liable to open up and let the water in; but the workmanship is very much admired.

The canoe may now be rubbed over with *milomilo*, a calcareous alga, which is stuffed into any small cracks and thus not only makes the canoe more seaworthy but gives it a coating as of white paint. This may be repeated daily for three or four days. Then all is ready for the attachment of the outrigger.

The outrigger float (*ama*) is made of light fresh timber and is very buoyant. It is of the same length as the hull and pointed at both ends. The booms (*iako*) vary in number according to the length of the canoe; there are never less than three and there may be even nine of them, the central one always much stouter than the rest. They are lashed to the top of the hull, one end flush with the off side and the other projecting for about 3 feet beyond the outrigger side. A piece of forked wood (*haku*) is lashed to the free end of each boom. The stem of this fork is lashed to the float [other observers say that it is inserted into the float] (fig. 50). The *haku* and *ama* together are just half the total height of the hull and one yard away from it. A long rod (*ngaloa*) or, if necessary, two or three rods tied together at their ends, is then firmly tied to the ends of the float in such a way that it passes over the central boom and forms a curve. It is also lashed to each of the *haku*. Two loops of sennit (*saukanga*) are made; one passes through a hole at the end of the strake and the other to the boom at the other end. These are used as grips to lift the canoe into the water. A few sticks or stringers may be tied across the booms to strengthen them and also for the foundation for a platform which is tied to them for long voyages. When two "peaks" are made the canoe is finished and ready to be launched. These breakwaters are cut out of solid blocks and fit into grooves at each end of the hollowed-out part of the canoe and thus serve to deflect the water;

they are detachable and are removed when the canoe is not in use. The seats are boards laid across the gunwales.

The longest canoe seen by Hogbin was just over 35 feet and the shortest 9 feet. The beam of the canoe ranges from 1 to 2 feet according to the girth of the log.

Sails (*pu'ei*; *pugei*, Thilenius) are used whenever possible. They are triangular in shape and originally were made of three pandanus-leaf mats sewn together, though now light canvas or calico is used. The size of the sail varies greatly. It is usually an equilateral triangle, or almost so, with a side of about two thirds the length of the canoe, though it may be either more or less. The mast (*kila*) is a long pole with a groove at one end, which fits roughly upon the edge of the washstrake. It is held in position by another pole, a mast-shore (*huilangi*), also grooved below, the upper end of which is lashed to the mast 2 or 3 feet from the top. These are stepped on the off washstrake by the fore and aft booms respectively. Occasionally, in order to give a wider spread, the mast and mast-shore are stepped against two small sticks which pass across the washstrakes at each end of the canoe. The luff or apex of the sail is attached to the mast by means of loops of rope, as is also the base to the boom (*uolo*). The tack is lashed tightly to the boom. The sail is not tied to the mast. A single shroud (*kouama*) is tied to the mast where the mast-shore joins it and the other end to the extreme end of the central boom. A sheet (*ha*) is tied to the boom and the other end is held by the man in the middle of the canoe. Sometimes a stick (*ko'o*) is also used to keep the boom from coming back into the canoe. The luff and foot of the sail are termed *uina*, the head or free edge *hanga*, and the tack *hakapu'ei*.

It is obvious that a simple rig like this can only be used in certain circumstances. If there is little or no wind it will tumble over on the outrigger side, and if there is a wind it must strike the canoe only on the outrigger side or the same thing will happen. The boom is therefore always on the side opposite the outrigger. For these reasons it is impossible to tack and therefore the sail can not be used against the wind. Looking at the canoe with the outrigger on the left, the bow is called *muli* and the stern *ingua*; but the canoe can be sailed either way provided always that the sail and mast are at the front of the canoe. If the wind changes the whole affair is taken down and put in the reverse position in the canoe.

The float preserves the balance of the canoe. If the canoe is loaded on the float side, the buoyancy of the float thrusts upward and prevents the canoe from capsizing; but it is far more seaworthy if loaded on the opposite side, for then gravity pulling on the float tends to prevent its capsizing. With the sail up, the weight is obviously on this side, as it has to be. Now, if a strong wind suddenly comes up, it puts too much weight on this side of the canoe and it capsizes, the float coming right out of the water. There is no possibility of the canoe going over on the other side, for if the wind changes to the other side of the canoe, no matter how hard it blows it will simply blow the sail over into the canoe, for it is only made firm on one side, namely, the outrigger side. It is not a frequent occurrence for a canoe to capsize, but it occasionally happens. Natives are adept at turning it back again so this is not a serious disaster, except for loss of property. In a big sea quite a good deal of water is shipped and the canoe may go under, but it will not actually sink.

In sailing, the canoe is steered by the person sitting aft, who is nearly always the youngest present; he holds a paddle fast to the gunwale just above the blade in the right hand and guides it with his left. The bailer (*ka*), which is of the ordinary Oceanic type, is in charge of the man amidships.

Other methods of propulsion are paddling or poling. Poling is preferred when possible. The polers stand up and keep only approximate time with the man ahead. In paddling, the man forward, who is always the senior man, takes his paddle (*hoe*) and puts it in the water on whichever side he fancies; the others use alternate sides and the last man steers. They keep time with the bow paddle. When paddling on the starboard side, the left hand is gripped over the top of the paddle and the right hand is clasped around it just above the blade. The paddle is taken out of the water after every stroke.

When the canoe is not in use it is carried up above the beach into the shade, always with the outrigger on the right looking from the sea. The hull rests upon blocks about 6 inches off the ground, and the float on blocks correspondingly higher. The canoe is covered with leaves to prevent the sun from cracking it, and if it is not to be used for some time, it may be partially filled with water. The sails are dried and rolled up; they are only attached to the poles just before each voyage. The anchor is made of a few heavy coral stones tied together.

NUKUMANU (TASMAN ISLANDS)

This large atoll with its numerous islands was originally called "Le Maire and Tasman Islands", which became shortened to Tasman Islands. Brigham (1900, p. 153) calls the largest island Niumano. It has also been called Lugumanu and Numanu, but the universally recognized name is now Nukumanu for the largest island and usually for the atoll.

As previously stated, Sarfert and Damm (1929) have shown that the culture of Nukumanu is similar to that of Leuaniua, and this applies in the main to the canoes: according to them there were the same five types. They give photographs of fishing canoes (1929, pls. 22, 23) which show an outrigger apparatus precisely similar to that of Leuaniua. Their sketch (1929, fig. 249) of a toy canoe in the Stuttgart Museum shows the following features:

> The hull is shaped like a European boat, but with a thin gunwale pole over which the booms are lashed. The float is about as long as the hull. The attachment consists of one vertical stick to each outer boom and two vertical sticks to the central boom, both being lashed to the same side of the boom. There are two oblong vertical sails, with a vertical spar on each long side; apparently one spar is tied to each of the outer booms within the hull and the other two spars to the central boom. The sails are unlike anything described for this island, and the attachment sticks are analogous to those of the craft of Taku and Nuguria.

Friederici states that the Nukumanu people formerly made sea voyages to Leuaniua, especially to fetch from Palao the valued yellow dye, *Cucurma longa*. He saw, in 1908 (1912, p. 300), 65 canoes (*vaka, vak*) of all sizes on the beach.

> The canoes had 3, 5, 7, 8, 9, and 11 booms (*kiyeto*); the most numerous were small craft with 3 to 5 booms; only one had 9 and one 11. Over these numerous booms lay 4 to 6 stringers (*aviha*), so that this portion of the outrigger apparatus appeared like a lattice. The stringers were mostly in two pieces fastened together. Neither the attachment sticks (*hakato*) nor the float (*ama*) are described. For the better strengthening of the numerous attachment sticks, peculiar bent rods (*aviha*) [the *ngaloa* of Leuaniua] were employed (Friederici, 1912, fig. 101, *a*). The hull was composed of sewn pieces of plank as in Leuaniua, but the ends were blunter and these canoes had a somewhat plumper appearance than those of Leuaniua.

A photograph taken by E. W. P. Chinnery affords useful information about the Nukumanu canoe (*vaga*):

> The end of the dugout has a slight rake and above this is cut square so as to form a slightly concave, narrow, triangular, vertical facet. The solid detachable breakwater (*tau*) consists of a vertical back and a flat horizontal fore portion, which is cut so as to be trim with the end of the hull. The other *tau* appears to be similar. There is a narrow washstrake (*hono*) stretching from one breakwater to the other; a strip of wood covers the junction of the strake with the hull. A thwart stick is lashed on the gunwale near each breakwater. Three booms (*kiato*) are lashed over the strakes. One is at what is probably the fore end so that the whole apparatus lies some distance from the stern. The float (*ma*) is about as long as the hull and is the trunk of a sapling with the bark retained; it is roughly chipped to a point at the ends. The attachment consists of a V-like stick (*natu*); probably it is a Y stick with a short stem embedded in the float, to which it is lashed, the lashing going around the float. The fore end of a bent rod, composed of two pieces joined together at their ends, is lashed near the fore end of the float. The rod passes over the fore and central booms between the forks of the *natu*, passes below the aft boom between the forks of the *natu*, and finally is lashed to the aft end of the float. Chinnery gives the following terms: mast, *hugi lani;* sail, *hugi*; fore and aft stays, *aviha*; rigging, *tauoma*.

Sarfert and Damm (1929, figs. 250-253) give illustrations of simple and complicated latticelike carvings (*velo*), which are fastened on to the stern of Nukumanu canoes (fig. 51). The carvings on Leuaniua canoes appear to be simple. I have not seen any illustrations or photographs of these in position.

TAKU

This group of islands is generally called the Mortlock Islands, but as there is a Mortlock group which consists of a large number of islands in the Caroline Islands and is well known in ethnological literature it seems advisable to discard this name. The main island of Taku was named "Marcken" by Lemaire in 1616, after the island of that name in the Zuyder Zee. This name has been incorrectly altered to Marqueen on the charts. Captain Mortlock saw the islands in 1795. The names of the most important of the numerous islands in the atoll are given by Chinnery (1927, p. 68). The largest is called "Tauu" by Parkinson and "Tagu-u" by Thilenius, but it appeared to Chinnery that the natives called themselves Taku, which is now accepted as the official name. The inhabitants of the atoll lived on the small island of Kapeiatu, having been forced to do so by the "owners". The Government of the Territory of New Guinea has now purchased Taku from the European owners and holds it in trust for the natives who had been dispossessed of all their land. The natives were formerly entirely dependent on these owners and worked under indenture; now the Government has repatriated them, and the people live on Taku where stand their old village site and gardens.

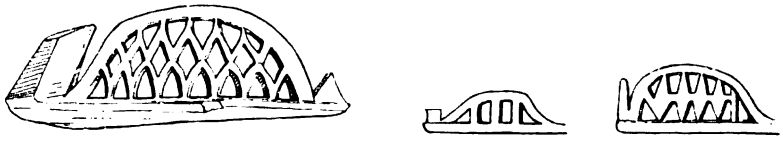

FIGURE 51.—Carvings attached to stern of canoe, Nukumanu (after Sarfert and Damm, 1929, figs. 250, 252, 253).

Chinnery (1927, pp. 70, 77, 81), who gives an account of the sociology and material culture of the people, states that the houses of the design and technique outlined by Parkinson no longer exist. He says:

> "The brachycephals predominate in the Mortlocks, the mesaticephals and dolichocephals in the Tasman . . . The earlier inhabitants of this group were evidently people with elaborate ideas connected with stars, which no doubt aided them to find their way during the long journeys they made in their big canoes between the Mortlocks and Tasman—journeys which are now abandoned."

Chinnery informs me that the Taku people are fine sailors. He has gone out with them frequently. When running with a strong leading breeze, one man stands on an outrigger boom and hangs out far to windward on the float to keep the canoe from capsizing when it is caught by a puff of wind. Sometimes the float rises several feet out of the water while the canoe tears along at a furious pace. He knows of no sport more fascinating than riding on the outrigger of a Taku canoe on a gusty day. The sails are now made of pieces of calico, duck, or canvas stitched together. The carved canoe extremities figured by Parkinson (1907, fig. 90) are again being introduced. A descendant of the former chief (*te-ariki*) has been appointed "Luluai", and his assistants are the descendants of the men of the leading classes. There are one or two old people still alive and they are teaching the young ones the old arts, crafts, and rites. The result is an interesting experiment—a people regenerating their old ways.

Friederici (1912, p. 300, fig. 103) says:

> The canoes (*vaka*) are proportionately broad dugouts with sewn planks (*hono*, *fono*, or *xono*). The lattice-work of the outrigger apparatus exists only in the largest boats. His sketch

shows the hull to be sharply pointed at each end. There are three widely spaced booms (*giato*). Four stringers (*lakau*) lie on the booms; the outermost, consisting of two pieces joined together, lies above the outer attachment sticks. Three spars are parallel to and between the fore and central and the central and aft booms respectively, which are lashed to the under sides of the stringers. The float (*ama*) is pointed at each end and is nearly as long as the hull. For each boom there appear to be two attachment sticks (*tugi*), which diverge from the float into which they are inserted; these are on the inner side of the two outer booms and one on each side of the central boom.

FIGURE 52.—Canoe (*waka*) of Taku (photograph by E. W. P. Chinnery).

Chinnery (1927, p. 85) refers to the account given by Parkinson (1907, p. 538), who, many years ago, found large canoes in special huts. Even at that time the weak people could no longer use them; they were too heavy for the united effort of all the men to push them into the water. These canoes were 14 meters long and 1.5 meters deep, and from the keel upward were built of planks sewn together. Both fore and aft they had a neatly carved and upwardly steeply slanting beak and a deck at each end on which were represented crudely carved figures in relief. The natives told Parkinson that these vessels were used in fishing for *lavenga* (*Ruvettus*) and that they were furnished with large triangular mat sails. When he returned some years later, only fragments of them remained.

A photograph (fig. 52) taken by Chinnery of a Taku canoe (*waka*) shows the following characters:

The hull has a rake at the bow. There is a rather broad washstrake (*fono*) which is composed of several planks of irregular form fitted together. At the bow is a triangular breakwater which is fastened to the ends of the strakes and over the squared point of the bow of the hull. The five booms (*kiato*) rest on the washstrakes. The float (*una*) is flat below and sharply convex above; the bow end is slanted up. The attachment of the fore and aft booms consists of a V-like stick (*tuki*), probably a deeply inserted Y stick, the angle of which is lashed to the float; the lashing does not go around the float, but apparently in a hole bored through it. The attachment of each of the three central booms consists of two

divergent sticks (*tuki*) inserted into the float, one on each side of the median ridge, and the ends are lashed to one side of its boom. There are three stringers (*sariki*) on the booms, one close to the hull, the other two above the attachment sticks.

Sarfert and Damm (1929, fig. 247) illustrate a model of an ordinary canoe (fig. 53).

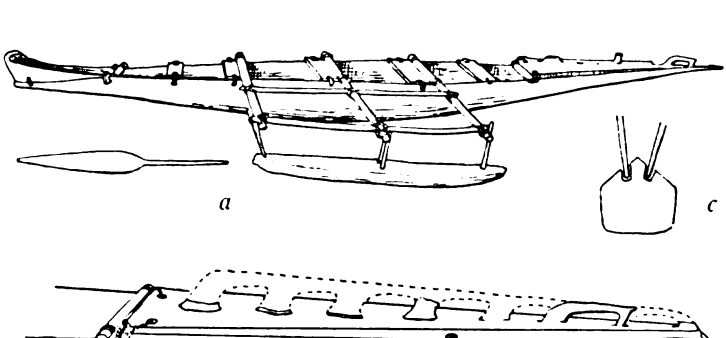

FIGURE 53.—Canoe (*vaka*) of Taku: *a*, model of canoe and paddle (after Sarfert and Damm, 1929, figs. 247, 250); *b*, bow-board; *c*, method of insertion of connectives (*b* and *c*, sketches by Dr. Paul Hambruch).

The bottom of the hull slopes up from the center to the pointed ends. A bow-board extends some distance from the end to form a fore deck, and at its aft end a short stick or thwart is lashed to it and to the hull. The bow-board fits on to the end of the hull and extends well beyond it, so that the bow is long and thin; the upper surface was originally cut so as to leave a median perforated ridge. Dr. P. Hambruch kindly sent me a sketch (fig. 53, *b*) which indicates this. The stern-board also forms a short decking; it is slightly raised aft and does not extend beyond the hull. The three booms are amidships. The float is very short. The outer booms have a single stick attachment and the central one two sticks. A stringer is tied to the attachments and another is nearer the hull.

The hull of a model of a sailing canoe (Sarfert and Damm, 1929, figs. 246, 255) has a similar form (fig. 54).

To each end is lashed a long slender beak, the end of which is carved in linear fretwork. The outrigger apparatus consists of five booms, one central; the two fore and the two aft booms lie close together, and there are two false booms between the central boom and the outer booms. The attachment of each boom consists of a pair of divergent sticks inserted on each side of the median ridge of the float, and the sticks are tied to the opposite sides of the boom. A stringer is fastened above the booms and false booms to the outer connectives and another to the inner connectives. There are other stringers nearer to the hull. The platform extends over the other side of the hull, and there is a triangular grid platform fore and aft of the main platform which extends to the end-pieces. The top of the mast looks like the handle of a spade, and the halyard is rove through the large triangular opening. The mast appears to be stepped on or close to the central boom on the outrigger side. There are several shrouds. The triangular Oceanic lateen mat sail is laced to two spars. The halyard is fastened at about one quarter of the length of the sail. The boom is horizontal; the halyard and sheet are tied to a short crossbar on the mast below the sail. The bailer is of the usual Oceanic type.

Small photographs taken by Chinnery show that the very long yard is vertical when sailing and stands upon the off gunwale, so that it is roughly parallel to but

widely separated from the mast. The boom is much shorter and is almost at a right angle with the yard or cants a little upward. The posterior margin, or leech, of the sail is much longer than in figure 54. These sails are now made of calico, and it is probable that their shape has been modified. The sail is of the Oceanic lateen type.

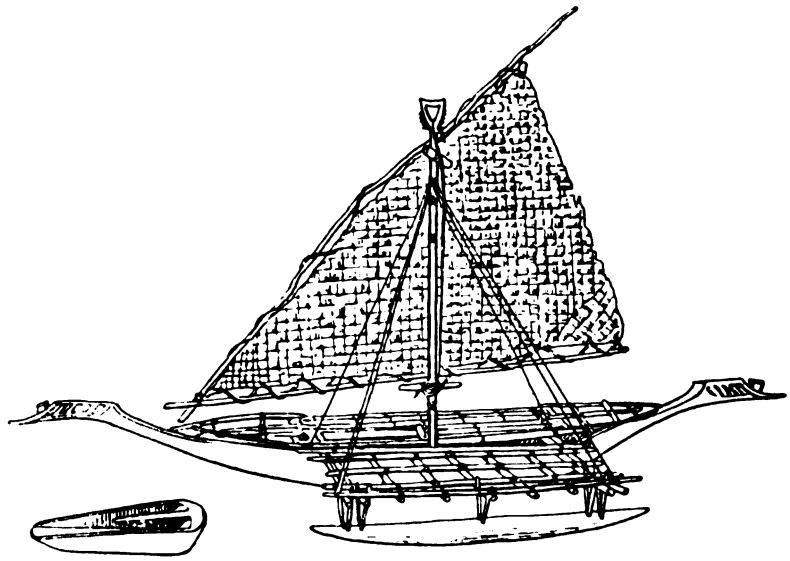

FIGURE 54.—Model of a sailing canoe with an Oceanic lateen sail and a bailer, Taku (after Sarfert and Damm, 1929, figs. 246, 254).

KILINAILAU

Kilinailau (Carteret Islands) comprises six islands on an almost circular atoll about 10 miles in diameter. The population consists of people who had been driven from the Hanahan District of Buka. Their traditions say that at that time these islands were inhabited by light-colored people who were gradually subjugated and whose only traces now are some finely worked ax blades of *Tridacna* shell, which are occasionally found in the ground and correspond in form to those of Taku and Leuaniua (Parkinson, 1897, p. 109; 1907, p. 472). Friederici (1912, p. 296) records three kinds of craft:

1. The *mon*.

2. An outrigger canoe (*haulua, holua*) of the Buka type (1912, fig. 93) which comes from the Hanahan District of Buka. The hull is narrow and sharply pointed. The very much shorter, sharply pointed float is widely separated from the hull, and the space between the two is spanned by a narrow platform of spars lashed firmly together. The attachment consists of two diverging sticks which are inserted into the float and are lashed to one side of a boom. This canoe is 13.8 meters long and 0.96 meter deep.

3. A Polynesian outrigger canoe which resembles in almost every detail those of Taku. The sides are vertical and so leave a wider opening than those of Buka, which tumble home (1912, fig. 94). The aft end of the float (*samana*) turns up slightly. Most of the larger canoes have five booms (*kioto*) which, in some canoes, extend beyond the other edge of the dugout, whereon a kind of platform is formed by two poles (*salusalun*); but there is nothing like the Buka platform. Friederici's statement that "the attachment sticks (*hasinan*) are of the Polynesian type" is too vague to be of much value. Sometimes, but seldom, there is a narrow washstrake, more like a gunwale-lath. The wooden bailer is of the Oceanic type.

Parkinson (1907, p. 508) refers to the triangular mat sail of this atoll and says that it is not new, as in 1767 Captain Carteret mentions it as characteristic. They now have European sails and rigging.

Friederici (1912, p. 297) remarks that the Buka people with their craft are the heirs of the Polynesians who once peopled the island. Somatically the Polynesians have been absorbed without leaving any trace. The Kilinailau people exactly resemble their brothers on Buka; Friederici did not see any sign of a lighter mixture. The presence of Polynesian canoes, which the Buka people continued to make in Kilinailau after the extinction of the Polynesians, is of the greatest interest, for the presence of these canoes with Polynesian technical terms in the Buka language would prove that Polynesians once lived here, even if there were no Polynesians now in Nuguria, Taku, Nukumanu, and Leuaniua. Friederici says those canoes not brought from Buka are made of driftwood. More than 80 outrigger canoes of preponderating Polynesian type were observed on the beach of the islet of Ehanu and a much greater number at Epiul.

NUGURIA

The term Nuguria is now officially adopted for the group often called "Abgarris" or "Fead". Parkinson (1907, p. 515) says that the islands consist of two atolls separated by a deep arm of the sea; the southern is Nuguria, the northern, Malum. The people are dying out and number only about 50.

Thilenius (1902, p. 60), who refers to visitors coming from Nakuor (Caroline Islands), Tarawa (Gilbert Islands), Nukupetau (Ellice Islands), and Samoa, says that the traveling canoe (*vaka*) of Nuguria is somewhat larger than that of Sikaiana, and similarly may have a triangular mat sail (*la*); the mast is called *suilani*. Such canoes hold from 16 to 24 persons. The illustration given by Thilenius (1902, pp. 90, 101, pl. 3, fig. 2) is based on models, and it very closely resembles the Taku canoe (fig. 53):

> The hull (*vaka*), which may be plank-built, slopes up at each end to a squared point. A solid bow-board (*pane*) is fitted on so as to form a short decking and a prolongation of the bow; its upper surface has a raised perforated carving. The solid stern-board (*pane*) also forms a short decking; its upper surface has a concave upward slope but does not project beyond the hull, as does the bow-board. [According to Friederici (1912, fig. 108), both ends are like the stern of the plate in Thilenius.] These additions and the way in which they are fitted to the hull precisely resemble the Taku technique (a stick thwart is lashed to the gunwales and to the proximal end of these pieces). There are seats (*fono*) aft of each boom and between the outrigger apparatus and the end-boards. The short, thick float (*ama*) has slightly upturned, bluntly pointed ends; it is attached to each of the five booms (*kiato, kiato-moto*) by two vertical sticks (*hakatu tongi*) close together. These are lashed to the fore side of the outer booms and to the aft side of the three central booms. Thilenius refers to a forked stick connective (*fakato*), but neither he nor anyone else gives an illustration of it for Nuguria. There are one, two, or more stringers (*lakau*) over the booms; in the illustration one runs outside the attachments. The hulls are limed and so the planks are not visible. Hold, *pa*; right side of hull, *katea*; left side, *iama*.

Friederici (1912, p. 300) states that in the canoes (*vaga, vaka*) seen by him there were one or two immaterial differences from the description given by Thilenius:

> The bow-boards and stern-boards (*tau*) are flatter, and the float (*de-ama*) is broader (as it is in reality) than is shown by Thilenius. The five or six booms (*giato, kiato*) are fastened to the float by sticks (*hagato*) which are not placed regularly according to a system. In many attachments three sticks lie close together in a straight line on the front side of each of the middle booms; in some, two lie together on one side and the third on the other. As a rule,

each outer boom is provided with one vertical and one slanting stick on its inner aspect. [In one sketch given by Friederici (1912, fig. 106) a strong stick slants up from its insertion into the inner side of the float to be lashed to each central boom at some distance from the float.] Only three stringers (*laurakau*) lie upon the booms, one of which lies outside the attachment sticks; both the others are equally spaced between this and the hull. Paddle, *hoi* or *hoe*; bailer, *dada*.

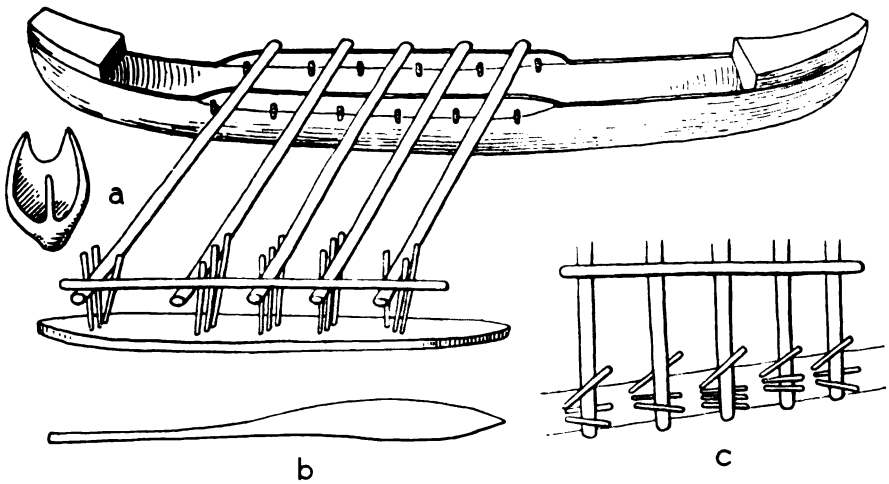

FIGURE 55.—Canoe (*vaka*) of Nuguria: *a*, bailer; *b*, paddle; *c*, connectives, showing their irregular disposition (after sketches by E. W. P. Chinnery).

Chinnery has given me some sketches (fig. 55) made at Nuguria of what is evidently a dugout:

> The hull slightly turns up at the ends, which are blunt; a thick board, or decking, which is slightly concave on its upper surface, is fitted fore and aft and carries on the curves of the hull. A short washstrake is lashed to each side of the center of the hull, and on it the five booms are fastened. The float is pointed at each end and has a broad flattened upper surface. There is no rigid regularity in regard to the attachment sticks, which are inserted into the float and tied to the booms. There are usually three for each boom, which may be all on one side of a boom or one on one side and two on the other; the sticks, as a rule, appear to be vertical, but in many cases one stick diverges somewhat from the others so as to be attached to the boom farther from its end than the others [the sketch given by Friederici is evidently an exaggeration of this arrangement]. A stringer may extend across the booms outside the attachment of the sticks or about the middle of their length.

NISSAN ISLANDS

These islands are dealt with as being the most northern of the Solomon Islands (pp. 116-120) but it would perhaps be more logical to consider them as marginal islands.

TANGA GROUP

These islands are referred to later as belonging to the south New Ireland area (pp. 122-123), but judging from their canoes they may equally well be regarded as marginal islands.

SUMMARY

Thilenius (1902, p. 60) refers to two types of canoe in the marginal ("Polynesian") islands, one in which the hull is a simple dugout, and one in which it is partly built of planks. The scarcity of hard wood is shown by the small pieces

of wood employed and by the different colors of the wood used in the same canoe. Both types of canoe are known in all these islands and are used in a similar manner. The employment of a tree trunk necessitates a convex side; the construction out of planks admits of a flat side. In both types the outrigger apparatus is placed nearer to the bow than to the stern. Friederici (1912, p. 300) states that the float is considerably shorter than the hull, but not so short as in the northern Solomons. The canoes are now painted with European paints: black or grey outside, grey or red inside, float grey, the small breakwaters and paddles blue, and so on.

A comparison of the methods of attachment of the float to the booms shows that these islands fall into four groups:

1. Tikopia and Anuda: two pairs of usually divergent overcrossed sticks and a pair between them, the sticks of which may be parallel and adpressed to the boom.

2. Rennell and Bellona: two pairs of overcrossed sticks as above and two divergent sticks that are lashed to opposite sides of the boom outside the other attachment; sometimes one or both of these sticks are represented by a pair of parallel sticks, which is the usual method in Bellona. (Overcrossed sticks form the primary attachment in the Matema and Santa Cruz Islands, and more or less overcrossed sticks are characteristic of Fiji, Samoa, Torres Straits, and elsewhere.) Occasionally the sticks of a pair may be parallel and adpressed to the boom. When two diverging sticks are inserted very close together into the float on each side of a boom and cross over the boom, it is not always possible from photographs to determine whether it may not be an attachment consisting of two forked connectives which converge over the boom, as in New Caledonia; but in the foregoing islands no forked connective has been recorded.

3. Sikaiana, Leuaniua, and Nukumanu: a forked connective (or Y stick) attached to one side of the boom, the stem of which may stand up from or be entirely inserted into the float. In Sikaiana there may be a vertical and an oblique accessory stick for each attachment (Thilenius), or one pair of overcrossed sticks for the central boom (Woodford), or perhaps more frequently no accessory sticks (Friederici). These doubtless are related to the sticks of Taku and Nuguria, but the occasional overcrossing suggests Samoan influence. There are two longitudinal bent rods connected only with the booms and attachments in Sikaiana, but in Leuaniua and Nukumanu there is a single bent rod the ends of which are tied to the float.

4. Northern islands: In Taku there are for each attachment two sticks which diverge from each other and are lashed to one side of each boom; in one photograph there is apparently a V stick for the fore and aft booms. In Kilinailau there is said to be an outrigger canoe of the Buka type and another of the "Polynesian" type which corresponds with the Taku canoe, presumably with an attachment of two divergent sticks lashed to one side of the boom. As previously stated, the canoes, and especially the connectives, of the Nissan Islands, north Solomon Islands (figs. 74, 75), and Tanga Group, south New Ireland area (figs. 76, 77), show a close resemblance to those of some of the marginal islands, and from this point of view these islands may be regarded as marginal islands. There is, however, a great diversity in the Nissan connectives; those of Tanga are like some of the Nissan connectives and are very similar to those of Nuguria. For Nuguria, Thilenius illustrates two vertical sticks close together on one side of each middle boom, or maybe two on one side and one on the other; there is a vertical and a slanting stick on each side of each of the outer booms. Chinnery's observations agree on the whole with those of Friederici. This attachment is essentially similar to that of the *tsine* canoe of Nissan, but it is very variable.

From the map given by Thilenius (1902, pl. 5) it will be seen that Leuaniua and the islands to the north have been subject to many influences from various parts of Micronesia as well as from Polynesia on the one hand and from the northern Solomon Islands on the other. Whereas Sikaiana and the islands to the south have been largely affected by "Polynesian" immigrants, the southern islands have also been influenced from Fiji, and Rennell perhaps to some extent from the southernmost Solomons. The numerous contacts mentioned for the several islands are of greatly varying order.

SOLOMON ISLANDS

A consideration of the types of canoes of the Solomon Islands has led me to deal with the islands in the following order, though I do not claim for it anything more than convenience: San Cristoval, Ulawa, Malaita, Ndai (Gower Island); Guadalcanal, Savo, Florida (Nggela), Ysabel; New Georgia; Ronongo (Sanongga), Narovo or Mandegusu (Eddystone), Vekavekala (Vella Lavella); Choiseul; Shortland Islands—Mono, Alu (Shortland Island), Fauro; Bougainville, Buka, Nissan.

Outrigger canoes of a special type are found at San Cristoval and of another type at Ndai, at north Malaita (reported as formerly there), and at Guadalcanal (only one canoe). Outrigger canoes reappear in different type in the Bougainville Strait and extend as far as Nissan. Beautiful plank-built canoes without an outrigger (which are generally known as *mon*) are apparently found exclusively in the central region of the archipelago. They are built in essentially the same manner throughout the whole archipelago, although there are differences in form and decoration. Rafts have been recorded in many places.

The first record of the *mon* of the Solomon Islands is in the narratives of the Spanish expedition under Mendaña (1901) in 1568. In Guadalcanal "they have not so much timber as in Santa Ysabel and for this reason fewer sea-going canoes [p. 91]." In Little Mala were noted "three canoes [*canaluchos*] larger than any that had been seen till then. They were measured and one was twenty-four paces in length, and seven feet in width, and the second was sixteen feet in width [Friederici (1925, p. 201, note 90) says this is naturally a slip for 6 feet], and the third was smaller. Storerooms were made in them, from which it was inferred that they were used for trading with other islands [p. 347]." Accounts by various writers in Mendaña (Sarmiento, Catoira, Mendaña) of Ysabel state: "They navigate along the coast in what they call *molas*, which are very light [p. 189]." "Their canoes are very well made and very light; they are shaped like a crescent, the largest holding about thirty persons . . . Their speed in rowing is marvellous; they row in the fashion of the people of Cartagena [p. 109]." "A great many canoes began to come off. They were long, and pointed at the ends in the shape of a crescent moon, and all full of Indians equipped for war [p. 227]."

Woodford (1909, p. 506) begins his valuable paper on the canoes of the British Solomon Islands by saying: "The beauty of the Solomon Island canoes has excited the admiration of all voyagers from the time the islands were first visited by white men." He gives quotations from Mendaña for Ysabel (1568); Cartaret for Malaita (1767); Bougainville for Choiseul Bay (1768); Surville for Ysabel (1769); Shortland for Simbo (1788); Labillardière for Ulawa (1792); and Brenchley (1855). Guppy (1887, pp. 246-271) in his account of the various discoveries of the Solomon Islands does not say anything about the canoes. Coote (1882) writes enthusiastically about these canoes.

Woodford (1909, p. 508) says that it is comparatively easy to determine at a glance the place of origin of a canoe, since the shape and scheme of ornamentation differ on the various islands [unfortunately no one has made an illustrated synopsis of these craft]. He writes: "For accuracy and neatness in construction I am inclined to award the palm to the canoes of the Shortland group in the Bougainville Straits, while for beauty of line and exterior decorations the large *tomako* or head-hunting canoe of the New Georgia group unquestionably excels." He refers to the wonderful dexterity of the natives in cutting and shaping the planks:

"A plan is first drawn down on wood by an expert canoe designer, to which the builders work. In most places, except on Malaita, a central ridge is left along the centre of each plank; this adds to the strength of the canoe. In the Malaita canoes the planks are thicker and do not require the added strength of a central ridge. In addition to the central ridge along the planks a projecting boss [cleat] is left at the places where the planks meet the timbers. The planks are lashed to the timbers with strips of fibre which pass through holes drilled in the projecting bosses." They prefer a pump drill tipped with a flake of chalcedony to an ordinary awl or gimlet. The ribs or timbers [inserted ribs or frames] are either naturally grown or shaped from the solid; they are never of bent wood. "The edge of each plank is accurately fitted to that next to it. Holes are bored at about two inches interval along the edges of each plank, corresponding with similar holes in the adjoining plank and a separate lashing of fibre, very neatly fastened, is made at each pair of opposite holes." [A canoe in the British Museum and a model in the Cambridge Museum show that the edges of the planks are thinned down to a chisel-edge, the flat surface being inside the canoe.] "The seams are covered with a thick dressing of vegetable putty, made from the scraped kernel of the nut of the tree *Parinarium laurinum*. This putty when first applied is of a lightish brown color, but soon becomes black, and hardens completely in about four days." Its drawback is that it cracks if long exposed to the sun, so the natives are always careful to put their canoes in shade and every village has boat-sheds beside the shore; these formerly also served as ceremonial houses.

Graebner (1913-b, p. 118) considers the internal longitudinal strengthening ridge of the planks in the middle islands of the archipelago as a local character, for these ridges are not found on Malaita or San Cristoval. The high ends which give a crescentic form to the boats are characteristic of the Solomons as a whole, but the asymmetry of the bow and stern in Ysabel [and in Florida and Guadalcanal] he attributes to Polynesian influence.

The most easterly islands, San Cristoval to Malaita, are not only characterized by the lack of the central ridge on the inner side of the planks of the canoes, but also by the occurrence of the third type of canoe which seems to be used also in Guadalcanal, but apparently nowhere else in the Solomons. Also characteristic is the bold black decoration which is in strong contrast to the light wood of the planks, though shell inlay is also employed. It is worth noting that all the islands here mentioned belong to what Rivers (1914, vol. 2, p. 252) terms the matrilineal region of the Solomons. Here also the dual organization was once prevalent, and a cult of the dead, the institution of totemism, and the practice of taboo, which, so far as is known, are present only in this region.

I had hoped to be able to give a description of the arrangement of the planks in the various kinds of *mon*, but some of the published accounts are not very satisfactory. In view of the variations in the records, it would be necessary critically to examine canoes and models in a number of museums in Europe and the British Isles and compare them with the published diagrams. I find that this is a task I am unable to undertake and must leave it to be done by some younger student.

PLANK-BUILT CANOES

Four main types of plank-built canoe are recognizable in the Solomon Islands (fig. 56) according to the information available to me, but occasionally one type appears to have modified another. The following descriptions refer merely to the form of the canoes and not to their decoration or ornamentation.

1. The typical *mon* is a plank-built canoe of which the edges of the topstrakes are continued in an uprising curve to form a peak of variable height at each end of the canoe (figs. 66, 70). This type is characteristic of the central islands: New Georgia, Mandegusu, Ganongga, Vekavekala, and Choiseul. It extends to a gradually decreasing degree as far north as Nissan and is also found in northwest Ysabel and to some extent in Florida.

2. A plank-built canoe with a typical *mon* peak aft, but the fore peak springs from two

converging fore washboards placed upon the topstrakes. This type apparently is confined to San Cristoval, where it is called *ora* (fig. 59, *a*).

3. A plank-built canoe with fore and aft washboards which are prolonged into a vertical peak of variable height at each end of the canoe. This is the characteristic type of Malaita and Ulawa; it is found also in San Cristoval and in Guadalcanal. The name *lisi*, which is applied to overseas canoes, may be adopted for this type (figs. 59, *b*; 60; 61). A canoe of very similar appearance occurs on Buka and has spread to north Bougainville, where it is called *mon*.

4. A plank-built canoe with a typical *mon* peak, usually not very high, at the aft end. At the fore end there are above the topstrakes two convergent fore washboards, in front of which is sometimes affixed a quadrangular board; the fore end of the canoe is thus more or less horizontal. This is the characteristic type of southeast Ysabel, Florida, and Savo, and it is found in Guadalcanal. The name *binabina* may be adopted for this type (fig. 65).

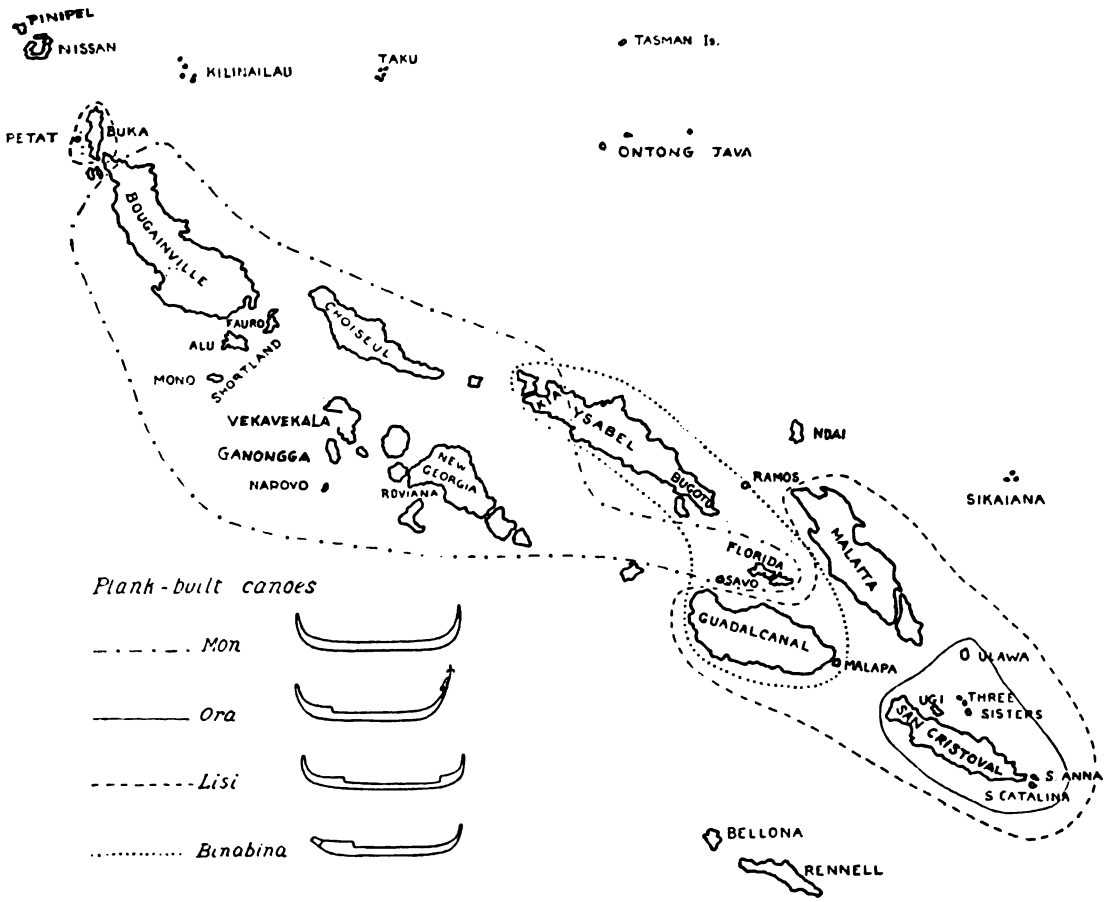

FIGURE 56.—Map of the Solomon Islands, showing the distribution of the main types of plank-built canoes.

Friederici (1925, p. 190, note 7) says that the plank-built boat is found under the names *iola, iora, tiola, tola, ora, mora, mola, mona, mon,* from the most southerly islands of the Solomons to New Ireland and as far as the Tanga Islands. It is most nearly akin to or is descended from the *orembai* of the Moluccas, whence it was brought to the Solomons. Especially the *mola* of Ysabel and Florida, which have no prominent fore peak and in consequence have not a complete half-

moon form, remind us vividly in every respect of the *orembai* of the Kei Islands and of the Banda Islands. This boat, generally termed the *mon,* did not reach the New Hebrides. The most important linguistic and technical information concerning the plank-built boat is given by Friederici (1912, pp. 236, 238, 290, 292-295, 303-308; 1913, pp. 159-162).

PADDLES

The paddles of the Solomon Islands are elegant and artistic objects. In the southeastern, and to a certain extent in the central, islands the blade is a long, finely pointed oval and frequently is painted with designs; the whole blade may represent a fish. In the central islands the blade is shorter and broader and does not run to a fine point, but apparently this type is being replaced by the southeastern type in certain areas. In Bougainville Strait the blades are oval and subcircular (Ribbe, 1903, fig. 10). At Bougainville and Buka the blades are an elongated oval, but not so sharply pointed as in the southeastern islands; they are characterized by remarkable representations of human figures or faces in red and black paint. These have often been illustrated (as for example Ribbe, 1903, pl. 4, and fig. 14). Lane-Fox Pitt-Rivers (1906, pl. 4, reprinted from a paper published in 1875) shows degenerative variations from a realistic representation.

Crutch grips are universal. They may be a simple bar or may be more or less elaborately carved (Ribbe, 1903, fig. 64). Illustrations of paddles are given by Edge-Partington (1890, vol. 1, pls. 204, 205) and of carved grips (pl. 207, fig. 8; pl. 215, fig. 7); Friederici (1912, figs. 116, 118-121); and Graebner (1913-a, figs. 1-6, 40).

SAN CRISTOVAL

The correct name for this island is San Cristóbal but I follow the usual practice of terming it San Cristoval to avoid mispronunciation as the Spanish 'b' is our 'v'. Occasionally the island is called Bauro. Ugi lies to the north and Santa Anna and Santa Catalina to the southeast.

Verguet (1885), who had his station at Makira, gives "Arossi" as the native name for the island. Fox (1924, p. 3) says that Arosi is a name for less than a mile of coast line on the north coast of the island, but for the sake of convenience he extends the name to the western fifth of the island. The remaining portion he divides into the central district of Bauro and the eastern one of Kahua. Makira is on the south coast where Arosi joins the district of Bauro.

Verguet (1885, pp. 219-221) says that the natives of San Cristoval, or "Arossians", as he terms them, spend a great part of their day on the water and have well-made canoes, firm, elegant, and light. There are three kinds: 1, *etea*; 2, *ora*; and 3, *solima*. The two last are without outriggers.

Outrigger Canoe

1. Verguet (1885) says that the *etea* is a canoe hollowed from a tree with white and light wood; it is about 4 meters long and 0.5 meter wide and of the same depth. It could not stand up in the water without an outrigger. The natives make this with a fan-palm branch deprived of its leaves. Verguet's illustration (1885, fig. 110) shows the dugout as having a rake at each of its pointed ends; there is a gunwale lath, and a seat just aft of amidships. One boom is lashed across the gunwales close to the prow and the other immediately behind the seat. The float is evidently the midrib of a palm leaf with the butt end aft. Each attachment consists of two looped withies. The loop of each is tied to the

float fore and aft of the boom and the ends meet above the boom. This is the double U-withy attachment.

Wood (1875, p. 111) refers to the very small canoes used for paddling about in the inner harbor of Makira. They "are very tiny, being sometimes only ten inches wide, and their outrigger [float] consists of a cocoa- or sago-palm branch." They are very crank and it requires considerable skill to sit in them. C. M. Woodford informs me that these little canoes are used only for paddling about in harbor or sheltered places; the float is very light and made of the midrib of a frond of the sago palm (*Metroxylon americarum*); the thin end of the midrib curves up in front. Guppy (1887, p. 147) writes:

"The pretty little outrigger canoes of Makira on the St. Christoval coast are only nine inches across; and the native sits on a board, resting on the gunwales of his small craft. From one side there stretch out two slender poles four or five feet in length and supporting at their outer ends a long wooden float which runs parallel with the canoe."

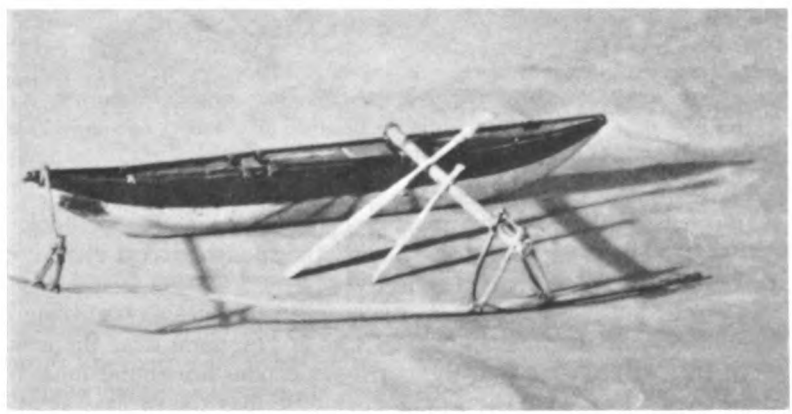

FIGURE 57.—Model of an outrigger canoe (*etea*), San Cristoval, Solomon Islands (Cambridge Museum).

In a letter dated December 19, 1930, Dr. C. E. Fox informs me that the *etea* was used originally only on the south coast, where sheltered harbors are numerous, but it is now found, though it is not common, on the north coast. The Arosi people say that it appeared there only in modern times. The canoe is a dugout. The free side is called *gou,* the fore boom *dadaro,* the aft boom *dadahoro,* the U-shaped rattan attachment *waropwarure,* the palm frond float *ha'aahe.* This canoe is called *geetea* in Bauro and *eetea* in Ulawa. An old Ugi man told Dr. Fox that the *etea* were formerly made and used in San Cristoval, Ugi, and Ulawa, but not on south Malaita; they were all of the same pattern and he stated emphatically that they were not in the least like Santa Cruz canoes. Dr. Fox adds that Santa Cruz canoes made an annual voyage to Santa Anna before white men came to the islands.

Dr. Fox kindly had a model (fig. 57) very carefully made by a native of San Cristoval for the Cambridge Museum.

In essentials the model corroborates the drawing and brief description given by Verguet. The main discrepancy is that the fore boom, which is lashed to the extreme end of the bow, is very slender and its attachment to the thin end of the palm-rib float is correspondingly delicate. The aft boom is stout and straight and is lashed over the gunwale laths immediately behind the broad seat. The float is very thin and tapers and turns up forward. Each attach-

ment consists of two U connectives which converge over the boom but do not actually cross one another (fig. 58); the ends of the outer limbs are connected with the inner ones by a served lashing. The hull is all of one piece and the upper part is blackened. The gunwale laths extend along the whole length of the hull and the booms are lashed over them. In the model there is a hexagonal seat midway between the main seat and the bow. There are two models of paddles, each with a carved grip. One, very much longer than the other, is evidently the steering paddle. Verguet figures crutch grips.

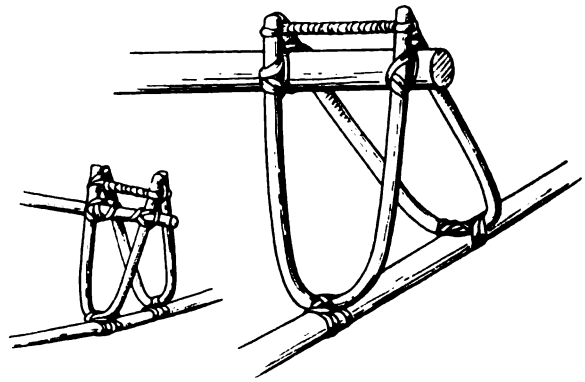

FIGURE 58.—Fore and aft withy connectives of a model outrigger canoe, San Cristoval, Solomon Islands (Cambridge Museum).

Paravicini of Basel has given me photographs that he took of *etea* at San Cristoval. These agree perfectly with the model, except that I can not see any served lashing between the connectives.

Verguet and Guppy refer to the outrigger canoes as occurring at Makira. The headquarters of the *ho'asia* festival was at Haununu near the center of the south coast, so it is probable that the outrigger canoes are found more or less along the south coast. Fox (1924, pp. 324-334) describes the *ho'asia* as an annual festival held in the month when the crops are ripe; the first fruits are offered, and the two most sacred objects connected with it are a sacred tree and a sacred stone. He considers it as a combination of the ideas of the Atawa and of the Araha (two of the several groups on the island of San Cristoval).

One of the incidents in the series of *ho'asia* ceremonies is the carrying of an outrigger canoe to the sea by an Araha man. He paddles well out, stands up in the canoe, goes through the action of drawing up a fish, and recites a long prayer to Kagauraha (Fox, p. 330). Later the canoe is brought ashore, the outrigger is removed from it, and both are taken into the *tawao,* "the sacred or spirit house." The originator of the feast is said to have been a member of the Araha clan.

Fox, (pp. 324, 356) suggests that San Cristoval was inhabited by two stocks before the Atawa arrived. The Atawa were said to be a fair, clever, superior people, who lived in round houses and held beliefs in certain kinds of spirits. They buried their dead in a sitting position in the ground around sacred trees and were the first bringers of the Austronesian language. Much later came the Abarihu, of whom the Araha were the one party (Fox, p. 360). These are "the people who followed the coast". They swarmed along the beaches and up the river valleys. They worshiped a winged serpent and the sun, lived in long houses, and held religious beliefs regarding stones. They buried their dead in stone tombs with dolmens. They were also an Austronesian-speaking people (Fox, pp. 325, 356, 360-364). "The Araha are surely the Suqe people of the Banks Islands" (Fox, p. 361).

I think it may be regarded as probable that the Abarihu introduced the outrigger canoe with the double U-withy attachment. It is not possible here to enter into a discussion concerning these people; the distribution of the attachment in question is given later.

Writing from Wango on San Cristoval, Bishop Patteson says:

"Just now I was surprised to see a canoe of the Santa Cruz shape and size, which is wholly unlike the canoe of these islands. On enquiry, I found that a canoe with four men had, some years ago, drifted from Santa Cruz to Ulaua Island, which is about 25 miles from this place, and that the people here had copied the model of this canoe, as being better fitted than their own for catching sharks. The Solomon Islands canoes have no outrigger, and would be more easily upset by the struggles of a heavy fish than the Santa Cruz canoe, with its well-balanced outrigger; and the tree hollowed out, though more cumbrous, is much stronger than the Solomon Islands canoe made of many slight planks glued together. I have seen but this one canoe here, and it is used only for this one purpose."

I am indebted to Dr. Ivens for this quotation. He adds in a letter to me:

"There is no warrant for Dr. Codrington's questioning (1891, p. 294) the plain statement made by Bishop Patteson as to the canoe at Wango being copied from the model of a Santa Cruz canoe which they had seen at Ulawa. Knowing the native conservatism, one feels no surprise at Guppy's statement (1887, p. 148) that the San Cristoval people had not adopted the Santa Cruz style of canoe—of course they had not."

Fox (1924, p. 339) says:

"The origin of *haka* for a ship and white men is unknown, but it was in very early use, apparently before the Melanesian Mission had visited Mota, so that it is unlikely to be the Mota word *aka*. Verguet before 1850 gives *waka* as the word for ship, and this is still remembered. How the change came to *haka* is not known."

Plank-built Canoes Without Outriggers

2. According to Verguet (1885) the *ora* in shape approximates a crescent. It is 8 to 10 meters long, 1 meter wide, and 0.5 meter deep. There is room for at least six paddlers and a load of provisions. It has no keel; the bottom is flat and but little below the water. It is so light that two men can easily carry it; sometimes the natives carry their *ora* over, rather than paddle round a peninsula with a narrow neck. The stern is the post of honor and requires a skilful paddler. There is no more elegant craft than the *ora* afloat. Its two lofty ends rock, waving the red plumes which adorn them. The front part [below the fore-strakes] is black; the pale color of the wood of the sides ornamented with mother-of-pearl throws up the dark color of the crew.

Verguet gives an illustration of an *ora* (fig. 50, *a*) with three men paddling. On the sides are four birds inlaid with nacre and there is a little inlay at the bow. The fore washboards rise up into a peak on the top of which is a bird's head with a fish in its bill and below this a frigate (?) bird. The stern has no aft washboards and is prolonged into a longer, thinner peak on which a small carved figure of a man is sitting; below this, head downward, is a dog as in the Ulawa bonito canoe. The peaks are ornamented with tassels.

Guppy (1887, p. 146) says:

"The small-sized canoe, which is in common use amongst the natives of St. Christoval and the adjacent islands, measures fifteen or sixteen feet in length and carries three men. The side is built of two planks; whilst two narrower planks form the rounded bottom. Both stem and stern are prolonged upwards into beaks which are rudely carved; whilst the gunwale towards either end is ornamented with representations both of fishes, such as sharks and bonitos, and of sea-birds." The planks are sewn together and seams calked with *Parinarium*. He gives (pl. p. 63) a photograph of a good model of an *ora*.

3. The *solima* is the largest craft in the Solomons. In shape it resembles the *lisi* but it is less carefully made. It can take 50 persons on board, and is used for long voyages. Codrington (1891, p. 294) saw one at Ha'ani (Fagani) in San Cristoval, 45 feet long, which would carry 90 men. Verguet's illustration (fig. 59, *b*) shows fore and aft washboards and the sides decorated with inlay work. On the high prow is a complicated carving of a frigate bird and other motives. On the lower stern peak is a vertical crest of some half dozen feathers (?).

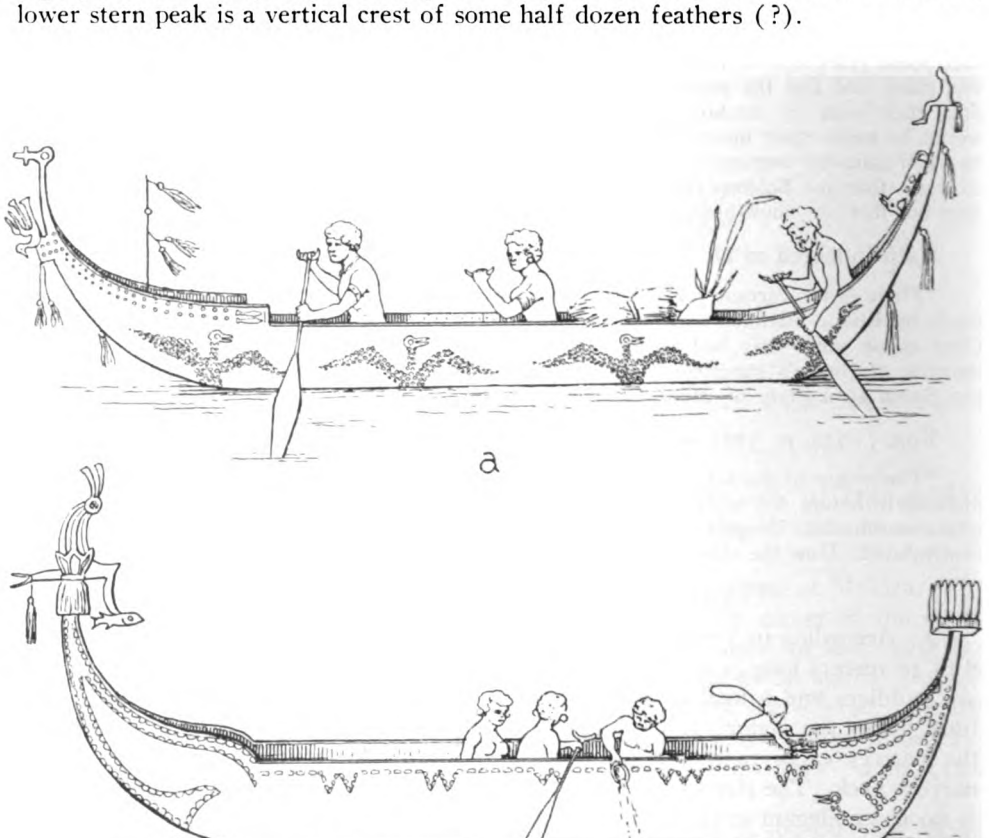

FIGURE 59.—Canoes, San Cristoval, Solomon Islands: *a, ora; b, solima* (*lisi* type) (after Verguet, 1885, figs. 111, 112).

Guppy (1887, p. 146) says that the larger and war canoes have the same construction as the smaller ones, except that there are three side strakes, and adds that the war canoe "is usually from 35 to 40 feet, its sides are of three planks; and the keel is flat, the stem and stern being continued upwards in the form of beaks." The inlay is of the pieces of the common pearl shell, small and large opercula of the shells of the Turbinidae, and flat spiral discs of ground-down cone shells. Along the stem and beak there is usually attached a string of white cowries (*Ovulum ovum*) or white *Natica* (*N. mamilla*).

A photograph of a fine *solima* by Beattie is given in the Handbook of the Melanesian Mission (1910, p. 19; and see Best, 1925, fig. 165).

Paravicini has given me photographs that he took of two types of plank-built canoes of San Cristoval. One (fig. 60) is precisely like the Ulawa *lisi* type in form and decoration and probably was bought from that island; it is the *solima* of Verguet. The other type is a variety of the *ora*. One photograph is of a very slender and elegant canoe with a well-marked peak at each end. That at the stern

FIGURE 60.—Canoe (*solima, lisi* type), San Cristoval, Solomon Islands (photograph by Dr. Eugen Paravicini).

is the more slender and has an effigy of a dog on its concave anterior aspect; this peak rises up gradually from the topstrake as in the typical *mon*. At the fore end are two converging washboards which gradually pass up into the fore peak. The canoe is slightly decorated with shell inlay. In another photograph the canoe is quite plain.

A canoe of *lisi* type was seen by the Templeton Crocker Expedition at Santa Anna in 1933 (figs. 61, 62). There are two keel planks in the bottom, and a keel is added to the seam between them in the larger canoes. There are two strakes

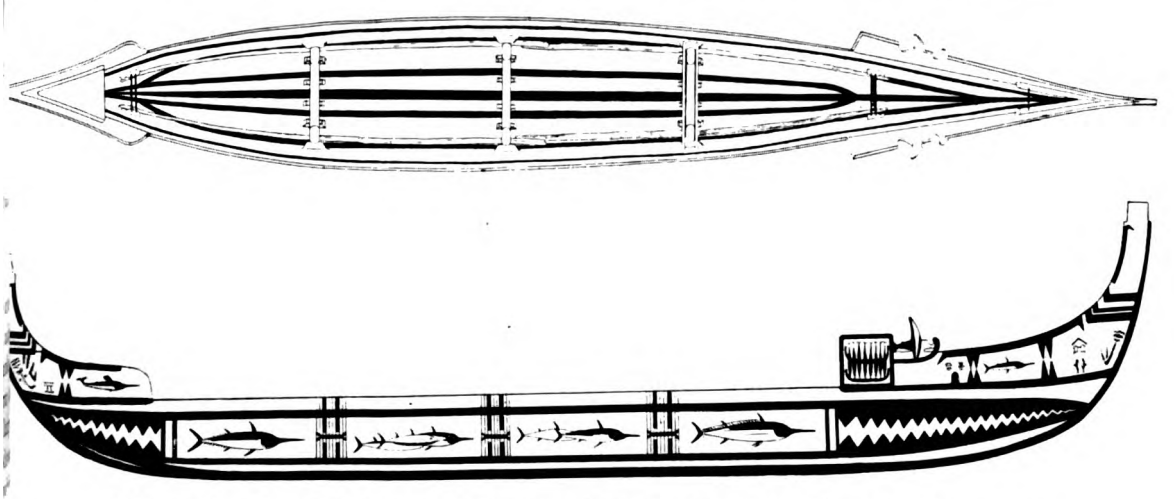

FIGURE 61.—Canoe of *lisi* type, Santa Anna, Solomon Islands, seen from above and from the starboard side with bow to the right (drawn by Toshio Asaeda, Templeton Crocker Expedition, 1933).

on each side and fore and aft washboards. The aft washboards are strengthened internally by a V-shaped frame which is provided with a cover that serves as a seat for the steersman. Three inserted rib-frames serve as seats; the fore one has crossbars which are lacking in the others. At the bow and at the stern is a lifting grip which is fastened to cleats in the upper strakes. On each side below the upper cleats is a longitudinal pole to which the rib-frames and lifting grips are lashed. Photographs of decorated *lisi* canoes at Owa Raha (Santa Anna) are given by Bernatzik (1935, pls. 26-28).

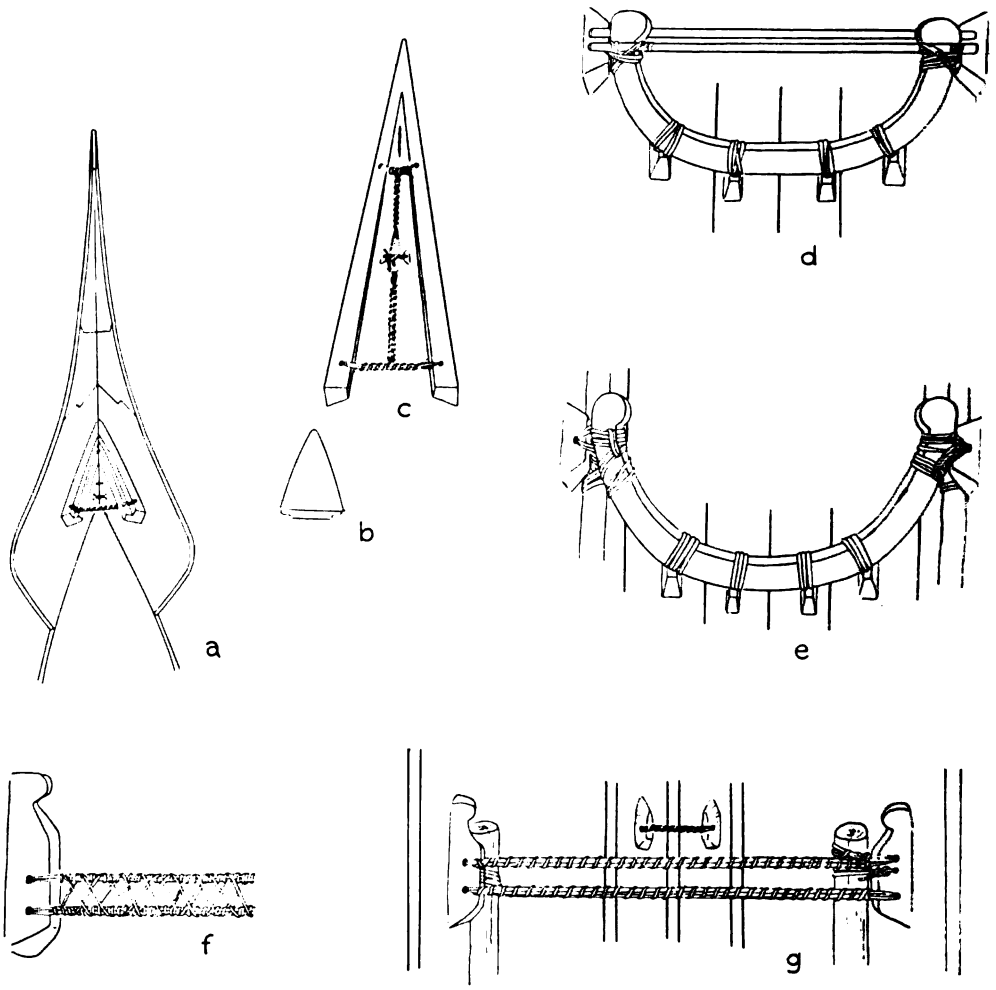

FIGURE 62.—Details of a *lisi* type canoe, Santa Anna, Solomon Islands: *a*, stern seen from above with V frame; *b*, stern seat-cover; *c*, V frame of bow; *d*, fore inserted rib-frame with seat; *e*, central rib-frame; *f*, lifting grip at bow; *g*, lifting grip at stern, showing also the two keel planks and the longitudinal poles (drawn by Toshio Asaeda, Templeton Crocker Expedition, 1933).

Photographs taken at Ugi on the Templeton Crocker Expedition show that the canoes are of the *ora* type, but the upturned ends are square and not prolonged into peaks. The canoes are made of light-colored wood, but the submerged part of the hull is blackened. There is very little decoration. It is stated that the orig-

inal inhabitants of Ugi were exterminated by natives of San Cristoval, Ulawa, and Malaita.

Rafts

A photograph taken on the Templeton Crocker Expedition in 1933 shows a raft at Santa Catalina which is made of some half dozen midribs of sago-palm leaves tied in a bunch at the fore end and splaying out aft; two logs are tied on the sides so as to form an inverted V-shaped bulwark. Codrington (1891, p. 294) writes:

> "A very graceful little catamaran is used within the reefs of San Cristoval; five or six stems of the fronds of the sago-palm lashed together, the tips of them brought back by lines toward the butts, and the end of the high curved prow so formed decorated with a crimson streamer."

ULAWA AND SOUTH MALAITA

Malaita is the official name of the island for which Mala is the native and was formerly the official name; it has been called Mwala and also Malanta which is wrong. A smaller southern portion, South Malaita (the "Little Mala" of Ivens) is separated by a north-south channel from the main island, Malaita ("Big Mala" of Ivens). Ivens (1927) gives an extensive account of the culture, from which much of the following information is taken.

In Big Mala, the Tolo people inhabit the south of the island and the Lau-speaking people occupy the artificial islands in the lagoon at the northeast and Suu Harbor at the extreme north. The peoples who live in the hills away from the coast have no canoes, except the Areare, whose country borders on the lagoons of the southwest coast and the dividing channel. These build large sea-going canoes and travel as far as Marau Sound at the end of Guadalcanal, but they are hardly a maritime people. The people of the dividing channel make more use of small canoes for local travel (Ivens, 1930, p. 29). The Rev. N. C. Deck informs me that thirteen languages are spoken on Malaita.

The first illustration and description of an Ulawa canoe, which he says was exactly similar to that of Arsacides (Malaita), was given by Labillardière (1811, Atlas, pl. 43); it is of the *lisi* type. The end-pieces are painted in a simple manner with quatrefoils, a bird, and other designs, and ornamented with tassels. The tip of the high bow is ornamented with a carved bird's head with a (red) fringe round its neck. The tip of the high stern carries a (red) tassel and has two vertical projections which may represent the tail feathers of a frigate bird. A paddle with a crutch grip is shown. This illustration was copied with modifications in Dumont d'Urville (1834-35, vol. 2, pl. 17, fig. 2). Woodford (1909, p. 515) says:

> "The lines of the Malaita canoes are not so elegant as those of other islands and in comparison with them they have, to a critical eye, somewhat of a clumsy and box-like appearance. The planks are thicker . . . Nevertheless they have a certain distinctiveness of decoration all their own. The decoration is produced by black coloration upon the planks, which are otherwise left in their natural condition. The canoes are broader in proportion than the *tomako* of New Georgia."

Codrington (1891, p. 294) writes: "The moon in her second quarter lying on her back is called in Florida a 'canoe of Mala'." A photograph by Beattie of a very small plank canoe at Bulalaha River, Malaita, shows convergent fore and aft washboards which do not rise into peaks. A photograph of small canoes used

by women at Port Adam, South Malaita, is given by Ivens (1930, p. 176); they are roomy craft. The fore end and the aft washboards, or *haku* planks, are slightly higher at their convergent ends and there is no peak. Best (1925, fig. 167) illustrates small canoes.

The canoes of Ulawa are of two main types, the bonito canoe (*iola*), which is my type 2 (*ora*), and the overseas canoe (*lisi*), my type 3. A small Malaita canoe is called *jola* or *yola* and a large one is a *baru* (Woodford, 1909, p 515). The generic name for canoe at Sa'a and Ulawa, according to Ivens (1927, p. 149), is *iola;* it is the *ola* of Lau and the *tiola* of Florida.

Woodford (1909, pl. 46) illustrates a *baru* (*lisi* type) 42 feet long, 5 feet 3 inches beam, and 3 feet 3 inches deep, and gives the names for all the various parts and decorations. Ivens (1930, pl. p. 224) gives a photograph of the same canoe, entitled "Langalanga overseas canoe". Photographs taken by Paravicini show that canoes of the same form and decoration are still made.

In his dictionary (1929) Ivens gives *ha'aahe* for outrigger float, and *'ai hao* for a raft of sago-palm branches.

The best information on the canoes of the island of Ulawa and of Sa'a on Little Mala is given by Ivens (1927, pp. 149 ff.), who describes the manufacture of a canoe and gives the names of the various planks and parts. His dictionary (1929) gives many more details. In making a canoe the future owner and his relatives and friends do the preliminary rough work, but experts are called in to finish off the planks and other parts and to put them all together. The art of canoe-building runs in certain families of Sa'a and Ulawa, and an expert builder can always make money (Ivens, 1927, p. 8). Canoes built on Ulawa have from time immemorial been taken to Sa'a, or Uki (Ugi), or San Cristoval for sale.

The *lisi* is described as follows:

> There is a keel (*kao*) which is larger and in two parts in Ulawa. In Sa'a there are three strakes, but in Ulawa the middle strake is omitted. The keel is made of a hard red wood (*mawa*). The planks or strakes are made of a less hard wood (*iola*) of light yellow color. The keel is beveled to fit the garboard strakes. The edges of each strake are beveled above and below, except the topstrakes, of which only the lower edge is beveled. This has a strip of hard palm tied along the gunwale (*tali eu*) to prevent attrition by the paddles. The planks are finally fastened by a strong creeper. The inserted ribs (*lusu*) are tied on to the eyed cleats (*korikori*); these vary in number according to the size of the canoe. The middle of the rib forms the seat in the ordinary canoe, and may be up to 6 or 7 inches wide. The shape of the rib in Ulawa is slightly different.
>
> A V-shaped erection of planks, the *haku*, is set up on each end to keep out the water. This is omitted in some of the canoes in sheltered harbors; canoes without a *haku* are called *iola pwau ko'u* and *soro* or *sorosoro*. The lower planks of the *haku* (which are the fore or the aft washboards), are set on the topstrakes; where they meet at the bow and stern they are fitted, tied together with cane, and cemented and strengthened by athwart braces. Each free end of these planks of the bow *haku* forms a somewhat higher panel, which in the decorated canoes may be limed or carved (Ivens, 1927, frontispiece, figs. pp. 306, 388).
>
> The *uloulo* or upwardly projecting peak of the *haku* is formed of two pairs of short planks fastened in the same manner as the lower planks. Above the L-shaped joint between the second plank and the lower plank is a simulated right-angled joint made by a layer of the putty nut; it is said that this *kale holo* is a survival of a joint that was there anciently. The third very short plank is called *toutou* (handle) and may be divided at the top. This is the usual structure of the *haku* of the large overseas canoes.

An X-shaped erection, a "bow rack" (*maulipesi*), still survives in the canoes of Sa'a and Ulawa on which in modern days spears and not bows are carried. The Lau people of Big Mala formerly used bows entirely and the Tolo people of Malaita carried bows and spears in their canoes, according to Ivens (1927, p. 297). Two crossed sticks are seen amidships in a canoe from Ugi (Brenchley,

1873, frontispiece). They are sufficiently high for the spears to be out of the way of the paddlers; on one there is a bent bow (see Codrington, 1891, p. 295, footnote).

The big canoes have a plug (*suhu*) in the stern. For small canoes the bailer (*idenu*) is the dried covering (*dahu*) of the flower of the coconut palm, but a wooden bowl is used in the larger canoes. A photograph of a small Ulawa canoe is given by Coombe (1911, pl. p. 258).

Paddles (*hote*) have a long narrow tapering blade (Ivens, 1927, fig. p. 136). Ordinary ones are 5 feet 6 inches long and 2.5 to 3 inches wide. They have a crutch grip. The steering paddles of the large overseas canoes are 6 feet 6 inches long and 3 inches wide, and there is a seat for the steersman on the gunwale between the two sides of the stern *haku*. Such canoes carry a *Triton* shell trumpet which is blown at the end.

Only the overseas canoes of chiefs were kept in canoe houses. At Sa'a there was a formal blessing of the canoe house each year.

Overseas canoes are of two sorts: 1, the ordinary *lisi nume*, Sa'a, and the *lisi nima*, Ulawa; 2, the inlaid and decorated *la'o*.

1. The *lisi nume* is the ordinary canoe for overseas travel. Formerly the men of Sa'a were formed into groups, each of which had its allotted tasks, and each group owned and manned a canoe for journeys overseas; the canoe was named after the group. There was no such division of the men at Ulawa, but every chief had his overseas canoe. There was a ceremony to make the *lisi nume* (not the *la'o*) available for the carriage of women.

2. The decision to build a decorated canoe (*la'o*) lay with the chief of the village, but as this touched intimately the pride of the place the people were far from reluctant to undertake the work (Ivens, 1927, p. 7 and frontispiece). The correct seat for a chief when traveling overseas in his canoe is by himself in the bow; he does not help with the paddling. The big sea-going canoes have five or six seats: the first and fourth are called *tahoi lalamoa* (lift out the victim), where the dead bodies are put; the second is called *mauli pesi* (bow rack); the third, *daudenu* (bailing); the fifth, *apite* (steering).

Apart from friendly visits to other islands (the traditional friendships were maintained throughout the generations) the overseas voyages were undertaken (1) for trade, when dances were given and the whole proceedings were festal, and (2) for showing off a new, decorated canoe, when monetary gifts were received. A tour of this kind to raise money for a new *la'o* canoe was called *atoato*, and a canoe decorated for this purpose was *iola atoato*. When a *la'o* arrived at a landing place conches were blown and the crew waited until the people came down to the beach. Presents were given and the canoe went on to the next place. Upon returning home a victim was killed. This happened also in the case of the *lisi nume* (Ivens, 1927, p. 154).

Codrington (1891, p. 294) says: "Canoes from Sa'a would make a six days' voyage for trade and pleasure, to Owa, Santa Anna, and Santa Catalina, in one direction, steering by the stars at night, and to Alite in the other." The Alite Islets, now generally known as Langalanga, are close to Malaita and near Florida but belong entirely to Malaita. *Spondylus* shell money used in Florida and at Sa'a is made in Alite. The islanders are said to have been enemies to their neighbors on the mainland (Codrington, 1891, p. 298), but this has long ceased to be true.

Native drawings (Ivens, 1927, figs. pp. 131, 388) show that the bonito canoe may be either relatively plain without the high projection on each *haku*, or well decorated. One drawing is almost identical with the photograph and diagram by

Woodford (1909, pl. 46). The husband owned the fore part of a bonito canoe at Sa'a and the wife the after part. Both had to practice abstinence from certain foods when the canoe was being built. (Ivens, 1927, p. 144.) A pig was cooked when a new canoe was first used and certain ceremonies were performed (Ivens, p. 250). A ceremony was performed when a new canoe caught bonito for the first time (Ivens, p. 311).

In some canoes (such as the long overseas *raku* canoe, which holds six men and has four ribs, and the longer of the bonito canoes) the *uloulo* (peak) may be made of two end-pieces, that is, solid V-shaped blocks, one above the other, the lower of which is fastened to the lower planks of the *haku*.

In the old days there was a type of canoe (*sara'a*, "branching") that had two projections on the prow. Ivens (1927, p. 152) says:

> "In the bows it had a short mast which was decorated with [white] cowries. The stern came to a narrow point, and above the stern *haku* there were carvings of two birds and a man. Surville reports seeing a canoe with a mast in 1769, and it was probably an *iola sara'a*, branched canoe. They have long since ceased to build them. It is probable that this canoe design . . . came from Hanua-asi, the submerged land of Lark Shoal." [Lark Shoal is south of Ulawa. The three islands of tradition are known collectively as Hanua-asi.]

Brenchley (1873, p. 249) refers to a large number of canoes seen by him in 1865 at "Ulakua" (Ulawa), the two ends of which were alike. They were richly decorated and inlaid and carried tassels of leaves dyed red. They generally carried two, rarely three, men, and were without outriggers.

The finer canoes are richly decorated (Ivens, 1927, frontispiece, Ulawa; Brenchley, 1873, title page, Ulawa). Ivens (1927, p. 153, figs. pp. 33, 306, 308, 311, 315) describes the decoration of overseas canoes. Besides carved and painted designs, the decorations consist of inlaid designs of *Nautilus* shell which is easily cut, but more especially of cone shell (*la'o*), which is very hard and has to be ground down to the required size; as many as 2,000 to 3,000 pieces of *la'o* may be inset. The ends are also ornamented with streamers of fan-palm leaves dyed red and tufts of white, red, and black feathers of parrots and hornbills, etc. Rattles of hard nuts make a jingling sound.

In front of the bow *haku* panel in many of the *lisi* canoes is a carving of a porpoise, or of a bird holding a fish in its beak, which faces the bow. A dog is carved on the stern *haku* of decorated bonito canoes; the head points downward and the mouth rests on one foot. There is a dog in the British Museum canoe of which there is a drawing given in Mendaña (1901, p. xxii), in a canoe shown by Brenchley (1873, title page), and in a San Cristoval *ora* (fig. 59, *a*). The dog motive was noted in 1792 by Labillardière (1800, vol. 2, p. 277), who gives an account of Ulawa canoes.

Frigate birds are definitely bonito birds. A clam-shell disc (*ulute*) from Little Mala worn as a neck ornament (Ivens, 1927, p. 394 and pl. p. 392) "has the conventional frigate birds cut on it, and also the 'canoe with rounded ends' which is associated particularly with Sea Spirits." Wooden carvings of sea spirits that are set up over the canoe houses are represented as standing in what is called *iola ho'i* (canoe with returned ends). No such canoe is known and it is quite possible that this *iola ho'i* represents the canoes of the immigrants (Ivens, 1927, p. 475). The *iola ho'i* is also associated with frigate birds and may be seen together with the conventional drawings of frigate birds on the cone-shell ornaments of Malaita—the *la'o* which are worn on the forehead (Ivens, 1927, p. 476).

Folk tales tell of a people who descended from the sky and were lighter in color than the aborigines among whom they settled. They either introduced the

worship of the *akalo ni matazaa* (sea spirits) or were themselves called sea spirits by the aborigines. The fact that the names of some of the sea spirits end in *manu* (bird) shows the association of them in thought with the birds that accompany bonito. There seems to be little doubt that these immigrants introduced the art of fishing for bonito which has such great social and religious significance for the people. The worship of the sea spirits is limited to those places in the southeast Solomons where the *malaohu* system of initiation was in vogue: San Cristoval, Little and Big Ooa, Ulawa, Sa'a, and A'ulu. In all these places the "binding" of boys on the beach was the prerogative of chiefs and we may come to the conclusion that the system of *malaohu* was founded by immigrant chiefs. It is more than likely that the supremacy of these immigrants was owing to their knowledge of how to catch bonito (Ivens, 1927, p. 476). Ivens (1927, pp. 475, 480) says that also associated with the sea spirits are the rainbow, sun-shower, waterspout, and black squall.

There is no evidence as to whether the immigrants actually reached Sa'a and Ulawa, but once the practice of bonito-catching was introduced into Arosi it would have spread in the neighborhood (Ivens, 1927, p. 477). The evidence points to San Cristoval as the home of the worship of sea spirits (Ivens 1927, p. 474).

The ghosts of the Ulawa dead rest on Ali'ite, the northern island of Olu Malau (The Three Sisters), and thence go to Malapa Island on their way to the other world at Kela, the south end of Guadalcanal. Those of Sa'a go straight to Malapa, and those of San Cristoval touch at Ali'ite before making Malapa. Ivens suggests that the immigrants first settled in these parts on Malapa and then on Olu Malau and Hanua-asi.

There is little doubt that Santa Cruz people drifted to Ulawa all through the centuries, though there is no evidence whether or not the Ulawa folk in olden times copied their canoes. As already mentioned, there is Bishop Patteson's evidence that they did copy the Santa Cruz canoes in the 1860's. Ivens informs me that to his knowledge Santa Cruz canoes were copied at Ulawa and were confessedly made for catching sharks by means of nooses after the Santa Cruz method. One such canoe was made while he was there. The shark-catching to which Codrington (1891, p. 294, footnote) refers must have been done in a very desultory fashion at Ulawa "more than twenty years ago", dating from 1891. Later, when Christians were more numerous, the natives practiced sporadic shark-catching, but the respect and reverence felt for sharks at Ulawa prevented the heathen from this fishery, except to a very slight degree (Ivens, personal communication).

MALAITA

The shore folk of north Malaita have canoes of a rough and ready make, strong enough to bear much knocking about on the coral, but inferior in construction and design to those of Ulawa and Sa'a or even to those of the Areare people of the southwest lagoons (cf. Coombe, 1911, pls. pp. 272, 276). The following information is taken from Ivens (1930, pp. 259-260):

> The canoes of the Lau people of the artificial islands range in size from those 8 feet long and capable of holding only one person to the big sea-going canoes that will accommodate 30 men. The general name for canoe is *ola*; a one-man canoe is *te lusu* (one thwart). The *ola ni ngwane* (men's canoe) holds 4 to 6 men. The larger canoes which will hold at least 20 men are the *soro*, which lack the bow and stern *'isu* erections and are used only in the lagoon; the *baru* with moderate *'isu*; and the *'ai 'isu* with high *'isu*.

The larger canoes have a keel (*buula*) with three planks on each side. A washboard (*tau fafo*) may be placed on the topstrake (*kame*). For work in the lagoon the keel and the first plank (*ai garua*) may be in one. This is done to give strength and to preserve the planking when the canoe hits stones. The large canoes have three or four rib-pieces (*lusu*) cut out of the solid wood. These are lashed to the cleats (*taitei*) by cane (*kwalekwale*). The planks are sewn together with a strong creeper (*kwaaro*) or with a climbing fern (*hata*) and the seams calked with the putty nut (*haia, Parinarium*). Lau canoes are built in a rough style. The planks are left thick and in the rough after adzing and are not rubbed smooth with stones. It is said that they were originally calked with mud. The chiefs are experts at canoe-making.

Women in Lau are skilled in the handling of canoes. They use their family canoes or may embark in the large canoes called *baru ni geni* (women's *baru*); some own little canoes for personal use. A strip of pandanus leaf is used as a bailer.

Photographs of the *lisi* type, a simple type of canoe, and one canoe of the *binabina* type were taken by the Templeton Crocker Expedition in Tai Lagoon, northeastern Malaita in 1933. The upturned ends of the canoes of the *lisi* type are cut square and in most canoes are very low; in none do they form a high peak.

The first requisite for porpoise hunting, a religious custom connected with the death feast of a chief (Ivens, 1930, pp. 170-173), is the provision of a "sacred canoe" for the priest and his assistants and new canoes for the "sacred company" associated with the priest in the hunting. These canoes are 12 to 15 in number and each holds four men. During the building of the canoes the company must not be seen by women. The sacred canoe is of better workmanship than the others; the sides are decorated with inlaid work of shell and with designs of clouds, fishes, and birds; but the decorative work is much inferior to that of Sa'a or Ulawa. After the hunting is over, the canoe is put away in a shed until the next occasion. Once the canoe is finished no woman may see it. When it is old it is carried to the charnel spot behind the "holy house" and allowed to rot. The hunting of porpoises is practiced by the people of Lau and Suu in the north, and of Auke and Langalanga in the west. Porpoises frequent the north and northeast of the island. The magical incantations in connection with the porpoise hunting and the hunting itself are said to have been learned from immigrants who dropped the "magic stone" for porpoises. The rites connected with "the sacred company" bear a strong resemblance to the *malaohu* system of Sa'a and Ulawa.

The other canoes have not the same sacredness, yet they are not put to common use after the hunting is over. They are painted with red, white, and blue stripes and decorated with red streamers.

The decorated canoe (*baru kwao*) is especially made for the ceremonies consequent upon the death feast of a chief (Ivens, 1930, p. 232). The builders are under certain restrictions. The craft is inlaid with *Trochus* shell and women may not see this being done. Other decorative shell work is done with *Nautilus* shell; porpoises, fish, and frigate birds are the chief designs. The stem and stern are ornamented with strips of the fan palm, dyed red by the hill people. Bunches of black and white feathers of the hornbill and cockatoo are tied to the tips of the *'isu*. Such a canoe holds 20 to 30 men. The steersman sits aloft on a seat in the stern *'isu* on a level with the gunwale and sets the timing of the stroke . . . The owner sits in the bow and does not paddle. A feast is held when a *baru kwao* is first launched, visits (*atoato*) are paid to the other islands, a conch is blown, and presents are received. Return presents are made when the donors themselves go visiting. Formerly a sacrificial victim was demanded for each *baru kwao* built, but the Lau practice was to seek a victim after return from *atoato* and not when

the canoe was launched (Ivens, 1930, p. 233). In Lau a victim might be bought or some inoffensive person captured.

The following brief account of the traditions about the culture heroes of Malaita and of the canoes in which they arrived is abstracted from the tale collected by the Rev. N. C. Deck (Ivens, 1930, p. 291), from Ivens' book, and from further information received from Deck and Ivens. This gives an indication of what might still be collected from other islands of the group, though doubtless much traditional lore has been lost and can never be recorded.

"There are definite stories in Lau of foreigners in outrigger canoes who coasted round the north end of Mala and left *fou* (magical stones), with accompanying invocations, at various places by means of which porpoises and bonito could be caught" (Ivens, 1930, p. 167). A "ghost" whose name has been lost as it was too sacred to be used, was worshipped in the "Holy Forest" at the head of the Auluta River. This man is locally known as Gwau meo (Red-head). He had red hair and wore clothes. He brought a turtle with him which he put into a pool called Tau funu; this is very sacred and no women are allowed to pass near it. Red-head wore a covering over his head and never allowed his hair to be seen; one day a grandson of his saw it and he killed the child. The father went off to live at Ano Mola in Fanoa, which is now a very sacred place, and another son went north. At the time when Gwau meo landed there were no people on Malaita [which is very doubtful] and he and his company are said to have populated the island.

There is a story of another red-headed man called Son of the Sun (Ivens, 1930, p. 292), who was the son of an aboriginal by an immigrant woman, who with her brother landed on the east coast of North Mala at a place which is held in great honor (Ivens, p. 300).

There is a story of eight brothers who spoke one language and lived near Mount Kolovrat in the center of the island. They quarreled and their language changed; then they separated and the people of Malaita are descended from them (Ivens, p. 292).

Ivens gives evidence (1930, p. 302) indicating that the immigrants into North Malaita came by way of the south end of Ysabel, "for the ghosts of North Mala go either to Momolu, an island at the southwest end of Ysabel, or to Ramos Island, which lies midway between Mala and Ysabel." They were fighting men and appear to have introduced food plants into north Malaita, as well as the areca nut, and to have taught the aborigines to build houses.

Gwau meo with his associates came in several *'ai garua* (dugouts), landed at Kela-Kwai near Auki on the west coast, and went inland to the headwaters of the Auluta River, to a place called Kiluabula out of sight of the sea (Deck, personal communication). Deck assumed that the *'ai garua* was an outrigger canoe; at all events it was not a plank-built craft like those of the Solomon Islands, which certainly came subsequently. Ivens (personal communication) says the *'ai karua* or *'ai garua* (hollowed-out tree) is a name also known in south Malaita and possibly in San Cristoval for outrigger canoe. The use of outriggers has been abandoned only within recent years at Su'u. Ivens never saw them and it is improbable that we can now find out what they were like.

Ivens also obtained the word *foo rua* (tie two) at the north of Malaita, and he has no doubt that this was also a name for the canoes of the immigrants. The *foo rua* evidently was a double canoe and Ivens is now inclined to believe that the immigrants came in double canoes made by fastening two *'ai karua* together. Ivens admits he employed the term "outrigger canoe" in a loose way, being influenced by the native term *'ai karua*, the outrigger canoe being the only one known to them now.

The Rev. H. J. Nind of Fou Ilia, north Malaita, has recently informed me that the first lot of immigrants came from Suirombo [Suu-i-robo] in two outrigger canoes tied together. There were many men, women, and children who went to Dai at the north end of Malaita. After passing Dai a big wind caused the two canoes to part company. Nothing is known of the one called *anuaiqai* but the one called *lake fake* (fire ship) reached Sueba and cruised along the east coast calling at various places where there was an opening in the reef and there they left magical stones for fish and porpoises, and also porpoise teeth. Eventually they reached Malaqalo in South Malaita where they were invited to settle. There they remained but kept up continual intercourse with the people whom they had visited on their journey down the coast.

The outrigger canoe is called *fou rua*; the boom, *lula*, is attached to the float, *tama*, by means of vertical sticks, *ai take*, and tied on by rope made of coconut

fiber. Nind was not able to find out how the sticks were arranged. I am not aware of any previous record of a double canoe being formed by two outrigger canoes tied together. The dugout which has no outrigger is called *ai karua.*

I think, pending further information, we must regard it as an open question whether these particular immigrants arrived in outrigger canoes as well as in double canoes; it is very probable that they did so. I have pointed out that certain culture heroes reached Raga, north Pentecost, in the New Hebrides, in double canoes or at all events it is certain that they were acquainted with such craft, and I venture to suggest that one stream of this migration also arrived in northern Malaita. Spanish voyagers, about 1600, recorded traditions of red-haired men cruising in the neighborhood of the Santa Cruz Islands and the Ambat of Malekula are said to have been light-skinned.

NDAI

Friederici (1912, p. 306) points out that at Ndai or Dai (Gower Island), which lies north of Malaita, there are both plank boats (*baru*), the smaller ones are called *beroko,* and outrigger canoes (*porua* or *forua*). All he says about the outrigger canoes is that they give the impression of being very rough and not very serviceable. The paddles (*foze*) have a crutch grip and the blade is very narrow, lancet-shaped, and sharply pointed (1912, fig. 121). Probably these outrigger canoes are similar to those formerly used in northern Malaita. It is possible that this island may eventually be classed as one of the marginal islands.

Friederici (1912, p. 308) says that the plank boats have the southern Solomon Islands form (1912, pl. 3, fig. 25; 1925, pl. 5). [They bear a close resemblance to the Malaita canoe illustrated by Woodford (1909, pl. 46).] He refers to seats at the bottom of the canoe.

GUADALCANAL

A good photograph of a canoe at Marau Sound at the extreme southeast of Guadalcanal (Guadalcanar) is given in Brown (1908, pl. p. 312). It resembles in every way the photograph of a Malaita canoe (*lisi* type) given by Woodford (1909, pl. 46) except that the painting on the sides is inferior.

Ivens informs me that at Marau Sound, where the people are immigrants from Malaita, a boat is called *tamatama rere.* He equates *tamatama* with the Mota and Oceanic *sama, samasama* (outrigger float); he is not sure about *rere.*

Paravicini (1931, p. 76) says that at Aola on the north coast there are four types of canoe:

1. Undecorated dugout (*gie-orkoa*); owing to the strong sea it is used only to a limited extent.
2. The plank boat (*roko*), stern peak rising from the topstrake and a quadrangular board at the bow in front of the fore washboards (1931, fig. 16). The most common type. It carries two to six men and is mainly used for bonito fishing.
3. The *bena,* similar in form but larger and can take 20 to 30 men.
4. The *gau,* has fore and aft high vertical peaks and can take as many as 13 men. Rare on the north coast.

In the Mole district at the eastern half of the south coast long voyages are undertaken in the large plank boats (*bena*) which carry 20 to 30 men and correspond in form with the *roko* of the north coast (Paravicini, 1931, p. 99). Paravicini kindly sent to me three photographs of canoes at Guadalcanal. The most interesting of these is of an outrigger canoe at Wanderer Bay on the southwest

coast, which is the first record for this island. Too much stress must not be laid upon this as it was the only example he saw and Fowler informs me that he has never seen one.

FIGURE 63.—Outrigger canoe, Guadalcanal (photograph by Dr. Eugen Paravicini).

The plank-built hull of the outrigger canoe (fig. 63) curves up at the bow, but the end is not shown; the stern is cut square and closed by a breakwater which is slightly higher than the gunwales. The canoe looks as if it had originally been longer and as if the stern had been damaged and cut off. The outrigger consists of two booms placed close together amidships and tied to the gunwales. The float is deep in the middle and curves up at each end to a sharp point; the slightly concave upper surface is flattened. The attachment for each boom consists of two divergent sticks inserted into the float and lashed to the outer side of the boom. A short stick or stringer over the booms is lashed to them and to the outer aspect of the outer connectives, another to the inner connectives, and a third over the other end of the booms just beyond the off gunwale. This stick attachment is very similar to that of Taku and is thus one of the variants found in the northern group of the marginal islands of Melanesia. Paravicini (1931, p. 110) was told by the maker that he had copied it from a canoe seen by him on San Cristoval, but there is no record of this type on that island.

The other two photographs are of plank-built canoes which are of precisely similar construction to those of the *binabina* type of Florida and Ysabel.

In one canoe, *bena* or *roko* (fig. 64), the square board at the end of the converging fore washboards is richly decorated with inlaid work, and an inlay of minute shells runs along the keel apparently from stem to stern. The fore and aft ends of the hull are also decorated with shell work in lines, spirals, crosses, etc. The other canoe is without shell inlay; at the fore end of the fore washboard there is a simple painting which presumably is meant to represent the mouth of a crocodile. In both canoes there is a row of *Ovulum* shells down the concave side of the stern peak and a few shells on the center of the upper border of the fore washboards.

From the foregoing it is evident that there are four types of craft in Guadalcanal: 1, the simple dugout; 2, the outrigger canoe which may be a relic of the "Polynesian" migration that passed by Ndai and northern Malaita and possibly colonized Rennell; 3, a plank-built canoe (*gau*) with washboards and a peak at each end, presumably of the Malaita (*lisi*) type; 4, a plank-built canoe (*bena* or

roko) of the Florida-Ysabel type (*binabina*), with a peak at the stern only and a horizontal bow. Photographs taken by the Templeton Crocker Expedition (1933) show type 1 at Kaukau Bay and type 3 at Kaukau and Aola bays.

FLORIDA (NGGELA)

Brenchley (1873, p. 279) saw two canoes at Florida in 1865, one carrying 22 men and the other 18. Each canoe had only one of its ends terminating in a high peak, about 10 feet high. There are generally six thin planks in a canoe. Codrington (1891, p. 295, footnote, and p. 294) says:

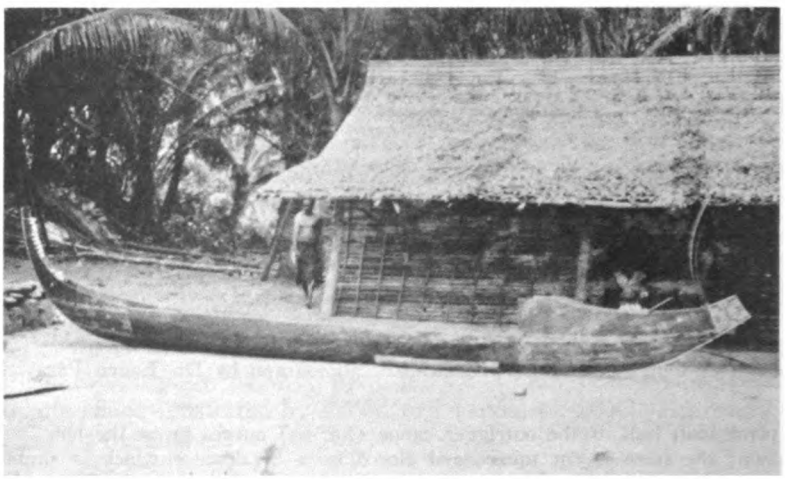

FIGURE 64.—Plank-built canoe (*bena* or *roko*), *binabina* type, Guadalcanal (photograph by Dr. Eugen Paravicini).

"The general name [for a canoe] is *tiola*; the *peko* is the war canoe, with stem and stern running up to high flat ends, and long in proportion to its breadth [*mon* type]; *mbinambina*, with stern turned up as in a *peko*, but with the head straight, with a guard of planks against the wash of the waves, and broader than a *peko* in proportion to its length [*binabina* type]; *tola*, with both ends turned up not very high; *roko*, with ends not turned up at all . . . The form of a Florida *peko* is more graceful than that of the Ulawa build."

A *peko* at Boli was 60 feet long by 6 feet wide, and the stem and stern turned up to the height of 15 feet. The canoes are constructed in the usual manner and have curved rib-pieces (inserted ribs). In a war canoe a rest for spears and other weapons is set up amidships; Codrington (1891, p. 295) illustrates a very elaborate example. This forms part of the rib-piece or frame cut out of a slab of wood and used to stiffen the canoe. Various *tindalo* charms are fixed and hung on the stern to secure quiet seas and a favorable result to expeditions. A figure-head (illustrated by Codrington, 1891, p. 296) shows "the head, which represents that taken when the canoe was first used, and the hanging board, which swings above the waves with a soothing motion, full of *mana*, but the bamboo tubes above wound round with red braid are stuffed with *tindalo* relics and leaves for protection and success." Codrington also alludes to festivities on the completion of a canoe and gives details of the killing of a victim for its inauguration, but nothing of the sort has occurred for the past 30 years.

Raymond Firth has kindly given me some notes on Florida canoes: 1, *na toro-toro*, a small canoe without special bow- and stern-pieces. 2, Canoes with low bow and raised stern are *na roko*, of medium size; *na binabina*, of large size (fig. 65). 3, Canoes of high stem and stern are *na tola*, of a medium size; *na peko*, of large size.

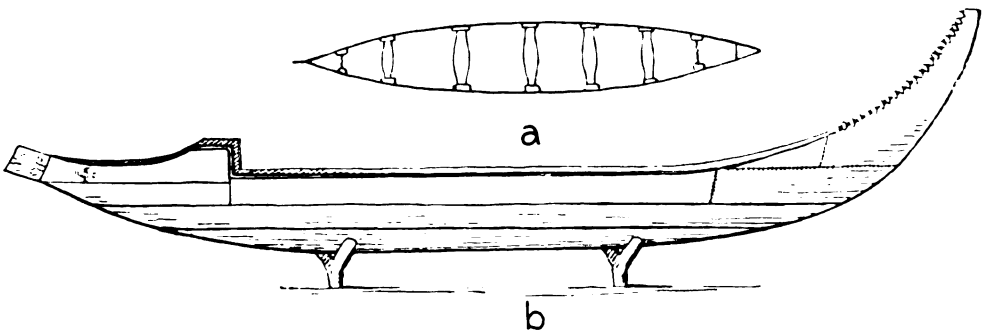

FIGURE 65.—*Binabina*, Florida: *a*, plan, showing seats and athwart braces at each end attached to cleats; *b*, side view of canoe supported off the strand (from a drawing by Dr. Raymond Firth).

One *binabina* is 22 feet long, 2 feet 3 inches in greatest width, and 3 feet 9 inches high at the stern. It was built at Raleta and bought at Beluga for 12 pounds. It holds 10 paddlers and a steersman, who is generally the owner.

To the keel (*mboru*) is fitted a bow and stern keel (*torolombo*). The lowest or garboard strake is called *raituria*. Above this is the *landa* (in most *binabina* canoes there are two of these of the same name), and finally the topstrake (*kindivore*). The two converging fore washboards (*vekovveko*) have a concave upper edge and a square aft end; in front of these is a small rectangular board (*ngoso ngoso*) with inlaid designs. There is an inlaid bird on the side near the bow. The aft planks, which are composed on each side of two thin planks, rise gently from the gunwales of the topstrake and are prolonged into a high peak; the small triangular plank is called *kikirisa* and the upstanding plank *kelakela*; this carries up the curve of the stern, its end is square and the concave edge is ornamented with *Ozulum* shells. The inserted frames or rib-pieces (*luku*) are used as seats in the small canoes but in the large ones there are broad, shaped seats (*konga*). Stretchers to hold the bow timbers apart are called *oriori*, the cleats, *puki*, and the black calking putty, *tita*. The canoe is dressed all over with black "paint" (*goga*). The drain hole is called *sogu*, the plug of coconut fiber, *pipito*, and the bailer, *karu*.

Penny (1888, p. 80) says that the common canoe (*roko*) holds 4 or 5 men, the ordinary fighting canoe (*peko*) about 20 men, and the largest he saw, 50 men. The best builders of the *peko* live in Ysabel. He also describes the construction of a canoe.

YSABEL

Medaña gave the name of Santa Ysabel de la Estrella to this island in 1568; the committee of the Royal Geographical Society in 1931 adopted "Santa Isabel Island (not Ysabel, Bugotu)," but it seems preferable to follow the common usage and to term it Ysabel. Woodford (1909, p. 506) quotes Surville (1769) who describes the canoes seen by him at Port Praslin on Ysabel Island as follows:

"The canoes of these islanders are constructed with great good sense, and finished with much skill; they are not formed of a trunk of a tree, made hollow by stone implements or fire, as those of many savage nations are, but are made of pieces put together. In the small canoes the planks are not more than a third of an inch in thickness, and in working them they

form on the inside a kind of loops, which at intervals are tied strongly with rattan to ribs of wood, bent in the shape of the boat, and serving as its frame; nor are the planks held together by any other means; the joints are stopped with a black mastic, tolerably hard, which renders these frail vessels impenetrable to the water. The prow and stern are raised very high, apparently for the purpose of defending the warriors in them from arrows, by presenting either end to the enemy: and in general they are ornamented with pieces of mother-of-pearl, forming different designs, and applied with mastic . . . One was seen 56 feet long by 3½ feet broad."

Ribbe (1903, p. 314) says that at north Ysabel the canoes differ from those of Choiseul, New Georgia, and the Shortland Islands in having no high peaks except on war canoes. He saw six canoes that had a representation of a crocodile's head at the bow. In one large canoe that held 16 persons (Ribbe, fig. 82) the crocodile holds a human figure in its mouth and over the snout is a low peak with carved wavy designs colored red, blue, and yellow; there are shell inlays of Z or N designs.

According to Woodford (1909, p. 514) the canoe used on Ysabel is of the same type as that in use at Savo, Florida, and on Guadalcanal. The natives do a good business in building canoes for sale to the neighboring islanders. The bows of these canoes are often ornamented tastefully with shell inlay and colors; the lines and curves are particularly graceful. Such elaborate schemes of decoration as shown in the *tomako* of New Georgia are not seen however. Woodford (1909, pl. 45) describes and illustrates parts of the *binabina* or large canoe and gives the native names in the language of the Bugotu district of Ysabel:

There are four strakes above the keel (*sara*), a central ridge is left along each plank with projecting cleats (*puipuhi*) to which are lashed the inserted ribs or frames. There is a "keel band" (*toroko-nago*) along the low bow; the converging fore washboards (*laulau*) are strengthened by two "small cross-pieces lashed to bosses on *laulau*." The fore washboards and the wedgelike square board (*suasuma*) in front are like those of the previously described *binabina* of Florida, as is the high aft peak with its "keel band" (*toroko-legu*). He shows "the figure board in stern," but does not describe this vertical erection. Two poles (lateral longitudinal poles) are lashed along the inside of the canoe and rest on the lower part of the inserted ribs or frames; they support the seats and prevent them from touching and straining the strakes.

The drawing given by Brenchley (1873, pl. p. 287) clearly resembles Woodford's photograph; he says that the canoes of St. George's Bay are the same in form as those of Florida but generally smaller. Coote (1882, p. 187) gives an illustration of a highly decorated Bugotu canoe.

I am indebted to Ivens for the following names of Ysabel canoes printed by Bishop Patteson in 1866 in the Bugotu language, which he termed Mahaga: *hinage*, the general term for canoe; *sosoro*, with no erections on stem or stern (see *soro-soro* of Malaita); *kenda*, with high erection at the stern and low erection at the bow; *peko*, with high erections at both ends (Ivens suggests that this is probably the war canoe); *biabina*, large canoe capable of holding 50 men; *tola*, large canoe with low erections at both ends. Several of these terms are similar to those given by Codrington for Florida.

Ray (1926, p. 526) says that ten dialects are spoken on the large island of Ysabel:

"The language of Bugotu in the south, and of Kia in the north differ considerably from those of other parts of Ysabel and also from each other. In Bugotu there is a large Indonesian element which is almost the same as that in Florida. In Kia Indonesian words are not so prominent and the vocabulary shows some connection with Roviana."

The following information has been given to me by Mr. W. Fowler, who has been resident in Ysabel for three years:

The Kia people are very dark in color, have fine features, and are intelligent and trustworthy; they are allied to the natives of Choiseul. The Bugotu are lighter in color, but owing to European contact are now inferior to and less trustworthy than the Kia. Culturally the Bugotu district is closely allied to the Gela district, which includes the islands of Gela, Nagetana and Florida, and the canoes are similar.

There is considerable variety in the size of the Bugotu canoes, each of which has its special term; for example, there is one term for a small canoe holding only one man and others for larger canoes according to the number of the crew. The *keda* is the general utility canoe which seats five men and has a horizontal or slightly rising bow and a high pointed stern peak. A keel plank (*sara*) and three planks or strakes (*thaithleka, poapoga,* and *moamangaru*) run along the length of the canoe. A washboard (*laulau*) is added to the fore end of each topstrake (*moamangaru*). The aft peak is formed of planks (*legu*) which carry on the line of the topstrakes. The ends of the *laulau* are bound to a small strip of wood (*suisamai*) which is triangular in section and the lower end of which abuts on to the *sara*; the *laulau* and *suisamai* are bound on to a bow-keel (*taroko nago*), the lower end of which also fits on to the *sara*. Similarly the ends of the *legu* are bound to a *boiboki* and to a stern-keel (*taroko legu*). To give further rigidity a served brace (*konga laulau*) is lashed between the washboards. A plank is about one inch thick and in adzing it out a central ridge (*ngaingagi*) is left which has projecting cleats (*puipahi*) at certain intervals. The edges of the planks are trimmed to a thin edge, along which holes are bored about 5 cm apart, and finally the planks are sewn together; the seams are calked (*laulamu*) with *Parinarium* putty (*muki*). V-shaped rib-frames (*lahu*) are lashed to the cleats; they are of the shape and size of the section of the hull and are cut from solid timber if they are not naturally of the required shape. The rib-frames indicate by their number the capacity of the canoe, as each one is also a seat, for the paddlers sit on the bottom of the canoe. When the building is completed the outside of the canoe is blackened and linear decorations in lime are made on the bow. A drainage hole is made in the bottom of the hull and plugged with coconut husk. Two steady workers take about two months to make a *keda*; only a very few men in a village can do skilled work. The Bugotu men sell canoes to the natives of the neighboring islands of Florida, Nagetana, the Russell Islands, Savo, and Guadalcanal.

Most of the canoes seen by Fowler along the Ysabel coasts have little, if any, decoration. Some of the canoes of the Kakota and Kia districts in the northwest of the island, all of which are of the *mon* type, have more elaborate markings in lime round the bow than those of the Gau and Bugotu districts of the southeast, and some are still furnished with figureheads.

The *tota* and *binabina* are large canoes of the same construction as the *keda*, and much time and care are devoted to their construction; their use is reserved for special occasions. Some of them have a line of *Ovulum* shells down the aft peak and a design in mother-of-pearl inlaid with *Parinarium* putty. They will hold as many as 50 paddlers who sit two abreast on seats which rest on two longitudinal poles lashed to the rib-frames. These longitudinal poles give additional strength to the long craft which can be paddled at speeds up to nine knots. This is the only form of canoe indigenous to Bugotu, it is of the *bina* type (type 4). In the northwest of Ysabel all the canoes are of the *mon* type, but owing to their introduction by, or in connection with, foreigners, *mon* may now be found in the Bugotu and Gela districts.

The paddle has a crutch at the grip about 3.5 inches long which may be of the same piece of wood as the shaft or may be added to it; the blade is long and pointed and is slightly curved. This is the present-day type, but Fowler has occasionally seen in use along the Ysabel coasts old paddles of other forms with rounded oval blades and a crescentic or even a ringed grip. These evidently are the paddles mentioned by Codrington (1891, p. 297) as used in Ysabel which "have

an obtusely pointed, short, and broad blade with a comparatively long shaft, the latter having a crescent-shaped handle [grip]." He also says that the blades of the paddles of the "Eastern Solomon Islands as far as Florida are pointed, some very narrow and pointed indeed." These have a crutch grip. Fowler says that the Ysabel men do not now spend time on the decoration of their paddles or, indeed, of other objects.

NEW GEORGIA

New Georgia may be accepted as the name for the largest island of the New Georgian Archipelago. Roviana or Ruviana (incorrectly Rubiana) is apparently the name of a small island and of a district in the southwest of New Georgia. Vangunu or Maravo Island lies to the southeast.

Somerville (1897, p. 369) was the first observer to give a good account of the craft for which he expresses the greatest admiration. He says:

"These graceful boats are of all sizes, from that of the 'one-man' of 8 feet long, to the great war canoe, or *tomako*, of 40 to 50 feet, which will hold perhaps thirty-five men. Whatever the size, they are all built on the same lines, and in the same manner [*mon* type].

"The planks are planed down to about half an inch in thickness or even less, but leaving in the centre of each a strengthening rib, which projects about three-quarters of an inch along the whole length . . . At the places where the ribs are to be secured, the mid-rib of the planks is left much thicker for a few inches, and, by means of a stout cane lashing, passing round the rib and through two holes in this extra piece, the sides of the boat are kept together. Close to the ends, where the boat is not more than 3 or 4 inches in width, the two side planks are bound together with two or more neat 'seizings' of split cane through similar chocks on the ribs. Both ends are pointed, and though there is a difference between bow and stern, it is not observable to the untrained eye. There is no decking . . . but the paddlers sit on small flat pieces of wood on the bottom, or raised like thwarts in the larger sizes of boats. One has to be careful that these seats rest on the plank mid-ribs, and not on the planks themselves. In the war canoes there is in the centre a sort of platform of sticks, similar to those in the houses, on which to place the heads of the slain, or to carry food and other things upon; and there are also wooden crutches at intervals along the length of the boat, to support spears, fishing rods, etc.

"The bow and stern of all the war canoes (Somerville, fig. p. 372), and sometimes also of the smaller canoes, are beautifully patterned with inlay work of mother-of-pearl, and a string of porcelain cowries is secured all the way down the great prows. On the top of the prows of the war canoes there is usually a carved figure, the commonest being a *Kesoko* . . . while the small canoes often have some fanciful design, such as a butterfly with hovering wings, a cockatoo, etc., carved and coloured. All canoes are invariably stained black outside, while the inside is uncoloured. Low down on the prow above the water line the head and shoulders of a . . . *Totoishu* is suspended; it is so placed as to dip in the water in front of the canoe. The function of this *Totoishu* is to keep off the *Kesoko*, or water fiends, which might otherwise cause the winds and waves to overset the canoe, so that they might fall on and devour its crew." [Somerville (1897, p. 372) describes and illustrates this well-known carving.]

"Just above [below?, as in the Florida canoe] this figure a small tablet of wood is hung. It is colored in red and white . . . The baler in the smaller canoes is roughly made of a banana leaf, stitched somewhat into the shape of a small coal-scoop without a handle; I believe that the same shape, but in wood, is used in the bigger boats.

"The ceremonies attending the launch of a new canoe are often terrible, as described by Mr. C. M. Woodford [1890, p. 155]. I never saw any of these functions; but Mr. Kelly told me that in Rubiana, among other ceremonies, two virgins are selected—one of whom is publicly violated, while the other is '*Hope*,' or tabooed, and is kept a vestal for fifty months; a guard is placed over her; and death is the penalty should she transgress."

The natives of these islands have for many centuries been in the habit of making raids upon neighboring islands for the purpose of taking human heads

and capturing slaves. Woodford (1909, p. 510) says that in one large canoe or in fleets they would visit the Russell group and the western portion of Guadalcanal, or would swoop down the coasts of Choiseul and Ysabel, and have even been known to extend their raids to Malaita. The consequences have been that the native population of the Russell group has been almost wiped out, and that on Ysabel the remnants of the coast people have taken refuge in the mountains.

A very fine *tomako*, or war canoe, is described and illustrated by Woodford (1909, p. 511, pls. 41-44). The plates are incorrectly described "from Ysabel." This canoe was the last in which a raid to Ysabel for heads was made, at about 1900. Total length, 44 feet; beam, 4 feet 8 inches; depth, 2 feet 4 inches; height of bow, 9 feet 7 inches; height of stern, 10 feet 9 inches. Woodford (1890, p. 157) refers to canoes 50 or 60 feet in length, from 4 to 5 feet beam, and 3 feet in depth, with bow and stern rising to a height of 12 or 13 feet.

There is a keel (*kutakuta*) to which are added bow and stern keels and five strakes. Names of the various parts are given by Woodford (1909), among others that of a mast and step for mast. He does not refer to a sail or rigging, so that this may be similar to the short mast of the *iola sara'a* of Ulawa. The hull has the usual construction including the two internal longitudinal poles (*harangana*) that rest on the inserted ribs or frames and support the seats. The plates show clearly the rich decoration of shell inlay and added ornaments, of which the most complicated is the ladderlike facing of the prow with its rows of *Ozulum* shells. On the top of the prow are two small images of human figures looking out fore and aft, and a larger figurehead near the water line. At the top of the stern there are two faces looking out to starboard and port. Thus watch is kept in every direction. The white arms on each side of the canoe indicate that heads have been taken; these appear to be painted after a successful raid. The inlaid rainbow on the stem is constantly met with in the canoes of New Georgia. In the smaller and less elaborately decorated canoes it is imitated in various colored paints.

Woodford deposited an accurate model of a large *tomako* in the Bethnal Green Museum, London.

The information given by Ribbe (1903, pp. 296-300) confirms that given above. He speaks with great admiration of these canoes and says that many of the large war canoes hold 30 to 50 men. A year or more is needed to build and decorate one.

After the planks have been made very smooth, they are painted black with the juice of *zeta* nuts (*Parinarium*) mixed with soot and charcoal. One finds hewn canoe planks piled up in each settlement, for almost every man is a canoe-builder. He refers to the prognathous jaws, large nose, and small receding forehead of "tambu" heads at the water line of the bow (Ribbe, 1903, fig. 78*a*) and to the row of *Ozulum* shells along the front edge of the bow peak, and to the rattan to which small carved tablets of *Tridacna* shell (Ribbe, fig. 79) are fastened. As at Kombakotta in Ronongo (Ribbe, fig. 59*a*) the rattan runs along the aft edge of the fore peak. The tip is ornamented with a rod bent down on itself to which bunches of feathers and brightly colored fibers are attached.

Ribbe (1903, pl. 12) illustrates a war canoe of this kind, with two paddlers on each seat. He adds that the smaller canoes are well constructed and with few exceptions are decorated with inlay. The tips of the peaks are ornamented with carved heads, birds, and so forth.

Hardy and Elkington (1907, pp. 98, 100, 104) give excellent colored plates of decorated canoes of "Rubiana lagoon," of a canoe house (p. 90), and of a "tapu virgin" (p. 136). Brown (1908) gives a good photograph (p. 412) of the bow and stern of a fine *tomako* and (p. 522) of a fleet returning from an expedition. Brown (1910, pp. 248, 336) gives photographs of models of inlaid

tomako and (p. 160) of a fleet returning from a raid, and gives a description of the attendant ceremonies. He says (p. 207): "The wooden figureheads found in the New Georgia group are not used in the islands to the westward of that group, with the exception probably of Choiseul." Photographs of two figureheads (*to-toishu*) from New Georgia are given by Paravicini (1931, pls. 80, 81). Illustrations and a description of these "canoe-prow gods" are given by Balfour (1905).

Paravicini has given me some photographs of the ordinary undecorated type of canoe (*mola*) seen at Maravo. The peaks vary greatly in height and may even be almost non-existent. In one canoe the peaks are alike and each has a simple carving at the apex (fig. 66). In the largest canoe the fore peak is much higher and stouter than the aft peak. This disparity occurs also in Florida; the fore peak may be profusely ornamented with *Ovulum* shells, etc., while in the same canoe the aft peak may be quite plain. Paravicini (1931, fig. 79) illustrates a dugout in Maravo lagoon.

FIGURE 66.—Undecorated canoe (*mola*), *mon* type, Maravo, New Georgia (photograph by Dr. Eugen Paravicini).

That outrigger canoes have been known in New Georgia is indicated by an extract Ivens sent me from Waterhouse (1928): "*hore*, to hollow or scoop out, a 'dugout' canoe; *kongga*, the beam of a house, the outrigger [float ?] of a canoe; *mola*, a built canoe, not a dugout; *tomoko*, a war canoe, carrying 30 paddlers. They were built of planks lashed with *asama* vine, and had high prows and sterns decorated with inlaid shell work; *vose*, a paddle, to paddle."

RONONGO (GANONGGA)

Rivers (1912-b, p. 460) says that the native name for Ronongo is Vesogogoto. It is divided into three districts: Ganongga on the west coast, Kumbakotta on the east, and Lungga on the southern end. The Admiralty chart calls the island Ganonga.

Concerning the people of Kombakotta, Ribbe (1903, p. 238) states that above everything it is on their canoes that they expend the most energy. The structure

of the canoes is the same as that at Alu and they vary in size to hold from one man to 50 or 60 men. The sides are decorated with mother-of-pearl inlay, and *Cypraea* (cowrie) shells are tied along the fore edge of the prow beak, whereas on the aft side, parallel to but not in contact with the beak, is a vertical rattan to which carved pieces of mother-of-pearl are fastened (Ribbe, 1903, figs. 59*a*, 79). At the bow, just above the water line, is the upper part of a human figure in which the chin usually rests on or is supported by the two hands (Ribbe, fig. 59*b*); the eyes are of nacre and around the eyes and ears and on the cheeks are delicate nacre inlays of Z- or N-shape. The head represents a good spirit that used to live in the mountains. Carvings of heads on the tips of the peaks are shown in Ribbe's figure 61*b*, *c*.

NAROVO (MANDEGUSU OR EDDYSTONE)

Rivers (1912-b, pp. 459, 460) says:

"The island, which . . . really consists of two closely connected islands, is divided into four districts, called respectively Narovo, Ove, Karivara, and Simbo, the last named district corresponding approximately to the smaller island . . . These four districts are occupied by four different sets of people . . . Each has its own chiefs and many special features of social institution. This name [Eddystone] belongs more properly to a rock off the southwest end of the island . . . The natives have a name for their island as a whole, calling it Mandegusu, or 'the four districts.'" The Admiralty chart now calls it Narovo.

Guppy (1887, p. 147) says that in the island of "Simbo or Eddystone" the white cowrie [*Ovulum ovum*] marks the canoes of the chiefs, whereas the white *Natica* [*N. mamilla*] decorates those of the rest of the people, and on page 150 he says, "In the quiet waters of the anchorage at Simbo, the natives make use of a raft of poles lashed together."

Hocart (1935) describes the construction of a canoe and the rites connected therewith and for bonito fishing. Ivens (1927, p. 475) says, "One may compare the account of the beings called Ave in Narovo Island . . . which are associated with rainbows, sun showers, shooting stars, red clouds" with the sea spirits of Ulawa (p. 95).

VEKAVEKALA (VELLA LAVELLA)

Rivers (1912-b, p. 461) was unable to discover how the island of Vella Lavella came to receive this name—one of its districts is called Veala. The people of certain other islands call the island Vekavekala, and the present name is perhaps a corruption of this. Friederici (1912, p. 306) says that "Vella Lavella" belongs to the area of the lighter-colored Solomon Islanders, whereas the Shortland Islanders, like their brothers in Bougainville, are as black as the blackest of African negroes.

Friederici says that the outrigger canoes (*sunasuna*) are of rounder form than those of the Shortlands which have some sort of keel. There is a ledge (*tana*) around the gunwale which lies farther out and is not so pronounced as in the canoes of New Hanover (Lavongai). Still these craft on the whole recall in their body those of New Hanover. He gives (1912, p. 307) the following terms: float, *sama*; booms with platform, *nzari*; sticks (4), *sipisipi*; sticks under platform, *onu*.

Ribbe (1903, pp. 235, 236, 245, 247, 192; figs. 64-66) found the plank canoes (*mon* type) at "Wella-La-Welle" to be sewn decidedly better than in Alu; they were calked with the usual *zita* nut. The peaks were delicately

decorated with inlay, but it was only rarely that an ornament was seen on their points. The canoes were identical in type to those on Kombakotta, but he thought that they were more richly decorated. The crutch-grip paddles had the same leaflike blades as at Alu and Choiseul, and many of the grips were inlaid (Ribbe, fig. 64) and beautifully carved. At Billoa village he was impressed by a one-seater canoe of which the fore and aft peaks were completely covered with painting in various colors (Ribbe, fig. 65*a*). Another canoe had the end of its peak carved with an elaborate spiral of five turns painted in alternate red and black triangles which stood out clearly from the brown background (Ribbe, fig. 66). Ribbe illustrates (fig. 65*b*) two human heads facing fore and aft on the peak of a canoe. He gives (p. 192) the following terms for Vekavekala, Ronongo, Simbo, and New Georgia: ship, *waka*; boat, *cuaka*; canoe, *mola*; paddle, *wosci*; mast, *tendegere*; sail, *tepe*. Friederici gives: canoe, *mola*; rib-piece, *onu*; paddle, *vozi*; bailer, coconut shell or pandanus leaf, *lipasa*.

There is a fine large canoe in the British Museum that was built at Guava, in the Gizo district of Vekavekala (figs. 67, 68, 69):

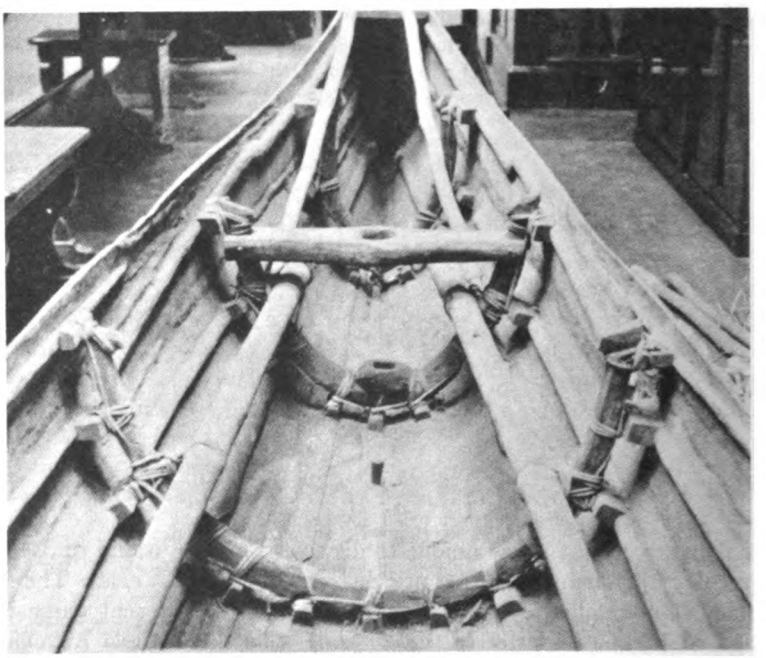

FIGURE 67.—Bow end of the interior of a *mon* type canoe, Vekavekala (Vella Lavella) (photograph by courtesy of Capt. T. A. Joyce of the British Museum).

The keel and the six strakes on each side have a median ridge with cleats at intervals for the attachment of the inserted ribs and frames (see also Hornell, 1935, pl. 6). There are two or three ribs at each end and elsewhere; the inserted frames have varied forms. The ends of the second rib at the bow are united by a bar of wood which is notched at the ends to clamp the rib and pegged to make all secure; this bar has a central hole for a mast, and a corresponding shoe is pegged on to the middle of the rib. The planks are thinned down at their edges, the edges are lashed together, and the groove thus formed is filled in with *Parinarium* putty. The whole exterior surface is also coated with this black putty.

Both ends are alike and rise into a high peak which is ornamented with *Ovulum* shells along its outer edge and along the inner edge with triangular toothed pieces of shell. The sides are decorated with inlay. A bunch of feathers is on the tip of each peak.

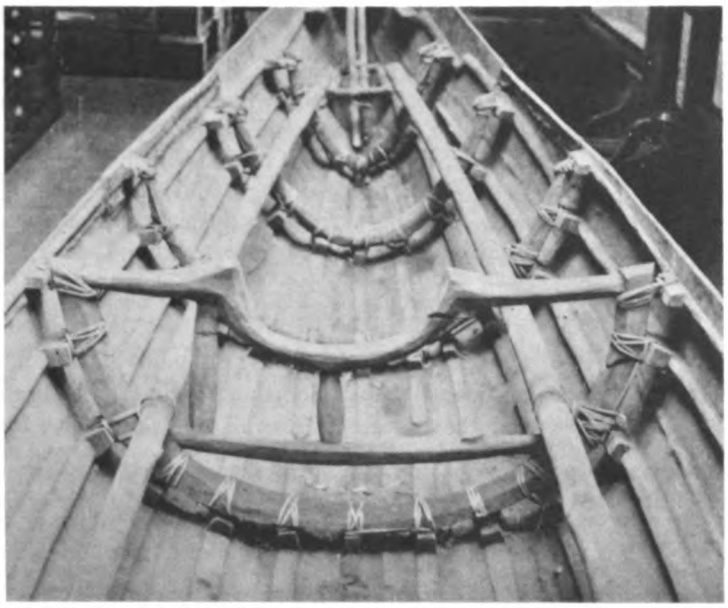

FIGURE 68.—Stern end of the interior of a *mon* type canoe, Vekavekala (bow shown in fig. 67); the two longitudinal poles within the hull are not constructional but were placed there for safe transport of the canoe to England; the same probably applies to the two thinner poles in the peak. (Photograph by courtesy of Capt. T. A. Joyce of the British Museum.)

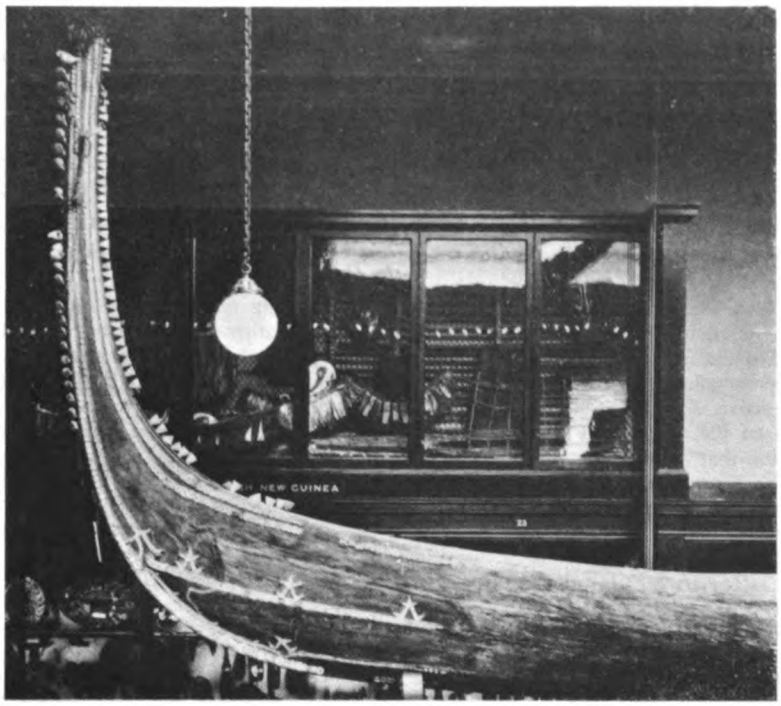

FIGURE 69.—Side view of the fore end of a *mon* type canoe, Vekavekala (same canoe shown in figs. 67, 68) (photograph by courtesy of Capt. T. A. Joyce of the British Museum).

CHOISEUL

The canoes at Bombatana, on the east coast of Choiseul are made in the ordinary manner according to Ribbe (1903, p. 318), whose illustrations show the usual upturned ends or peaks. The sides of the bow and stern are beautifully decorated with inlay work. On the bow a human face is carved which is not so well done as those in New Georgia, Vekavekala, and Ronongo, and it lacks the inlay around the mouth and on the cheeks. The high ends of the canoes are decorated with carved and painted human heads and birds.

SHORTLAND ISLANDS

The more important of the Shortland Islands, Bougainville Strait, from west to east are: Mono (Treasury Island), Alu (Shortland Island), and Fauro (Faro). Guppy (1887, p. 150) says of the canoes of Bougainville Strait:

> "'Dug-out' canoes are only to be found in the sheltered waters of Treasury Harbour [Mono]. They are from 16 to 18 feet long, are provided with an outrigger, and are so narrow that the occupant sits on a board placed on the gunwales with only his feet and legs inside the canoe . . . For sea-passages, greater stability is sometimes given to the large canoes of the Straits, by temporarily fitting them with an outrigger on each side, in the form of a bundle of stout bamboos lashed to the projecting ends of three bamboo poles placed across the gunwales of the canoe [1887, p. 149] . . . The natives of Bougainville Straits occasionally fit their war-canoes, when heavy laden, with temporary outriggers [1887, p. 147]."

According to Friederici (1912, p. 304) the dugout (*hakas*) at Alu and Awa in the Shortland Islands does not have a platform (*tanama*) of the pronounced Buka form. The three booms are connected by two stringers a hand's-breadth apart. The outrigger apparatus is not at the middle of the hull, but more in front and is always on the starboard side. To the fore of the platform is a seat with a hole for the mast. Mast, sail, and rigging: *kevala* (Alu), *taka* (Awa). In the Shortland Islands canoes there is a strongly pronounced distinction between bow and stern. Unfortunately there is no description of the method of the attachment of the float to the booms. Presumably it is of the Bougainville type.

A photograph taken by F. J. Wooton Isaacson (Royal Geographical Society collection) shows some small canoes at Faisi Island, southeast of Alu:

> The long, sharp-pointed bow has a little simple carving on the under surface; the stern end has a diamond-shaped protuberance and there is a rather broad washstrake. The three booms are about a third of the canoe length from the bow; their proximal third is a platform of transverse poles which lie between the booms. The float is about half the length of the hull, flat above, sharply pointed at the ends, and raked. The attachment consists of a vertical stanchion on the aft side of each of the outer booms. The end of the central boom is tied to a lashing that passes from one stanchion to the other. The crutch-grip paddle has a round blade. Another photograph shows a small plain canoe with three booms and a typical Buka attachment of two long, thin, slanting sticks; on the proximal half of the booms is an indistinct platform.

In a letter to me dated October 8, 1918, Mr. C. M. Woodford writes:

> "A peculiarity of the Shortland outrigged canoe is their fiddle-shaped bow. This I believe to have been copied from an old trading steamer named the 'Ripple', the owner of which, Ferguson, was a great friend of Gorei, the chief of Shortland. Ferguson was murdered at Bougainville about 1880. Gorei's son, who afterwards succeeded him, was named Ferguson. I mention the above in case anyone should later found any theory upon the singular shape of the bow of the Shortland outrigged canoe."

Concerning the plank-built boats, Guppy (1887, pp. 148-150) states:

"On account of the frequent communication which is kept up between the different islands of Bougainville Straits, where open-sea passages of from 15 to 25 miles have to be performed, the larger canoes are in more common use and in greater number than in the eastern islands of the group. These large canoes vary in length between 40 and 50 feet, are between 3½ and 4 feet in beam, can carry 18 to 25 men, and are paddled double-banked. They are stoutly built with three lines of side-planking, and two narrow planks forming the bottom of the canoe: all the planks are bevelled off at their edges." They are sewn together by narrow strips of the climbing fern *asama* (*Lygonia*), which have the pliancy and strength of rattan. The seams are calked with *tita* (*Parinarium*) . . .

"The natives of Bougainville Straits do not decorate their canoes [*obuna*] to any great extent . . . The stems and sterns of the large canoes of Faro and of Choiseul Bay are continued up in the form of high beaks, which rise 12 to 15 feet above the water . . . these high prows, when the canoe is turned end on to the enemy, afford shelter against arrows and other missiles [according to the old voyagers].

"To the stem of the canoe, just above the water-line, is sometimes attached a small misshapen wooden figure, which is the little tutelar deity that sees the hidden rock, and gives warning of an approaching foe [1887, p. 149, fig. 10, pl. p. 74]. They are similarly employed by the natives of the adjacent island of Simbo, and of other islands in this part of the group." Double-headed figures are often placed on the tops of the high beaks of the Fauro canoes.

The Shortland Islands plank canoes of *mon* type (fig. 70) are described by Woodford and Ribbe:

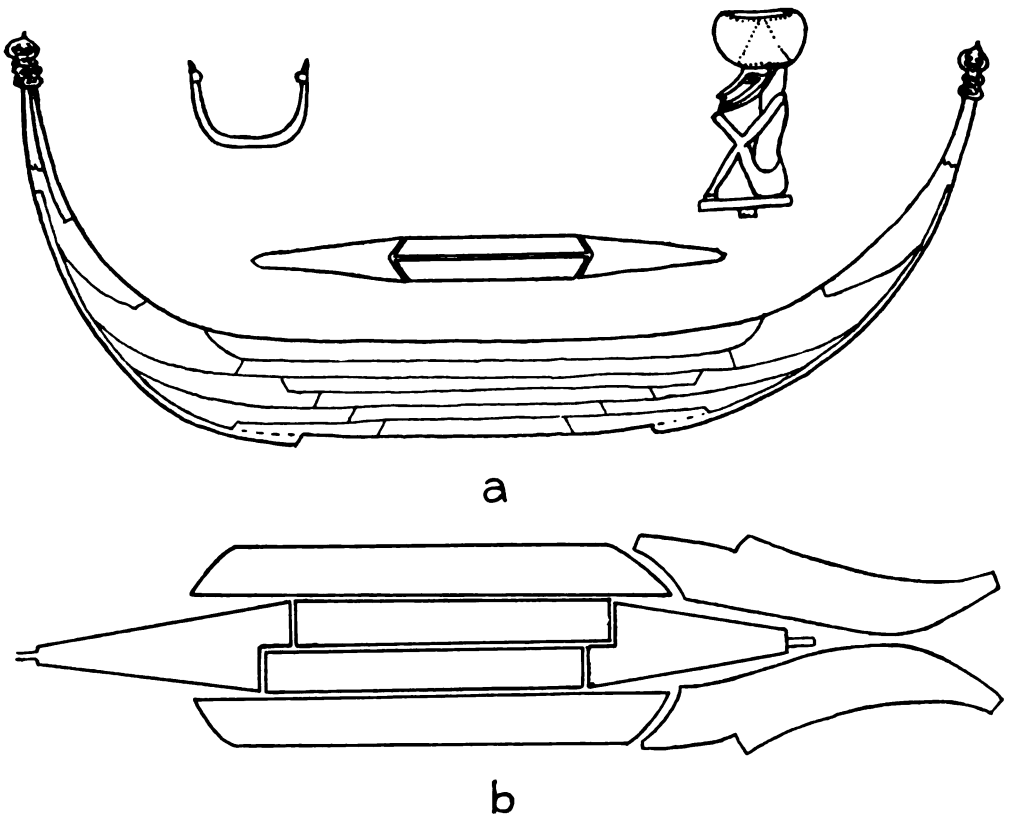

FIGURE 70.—Shortland Islands canoes: *a*, side view of a *kinu* (*mon* type), keel-strakes (*hangamiri*) and the median strake (*ora*) at each end, inserted rib (*siu*) (after Woodford, 1909, pl. 40); figurehead (after Ribbe, 1903, pl. 8c); *b*, early stage in the construction of a *goa*, "showing the ingenious break of joint between the *hangamiri* and *ora*" (after Woodford, 1909, fig. 1).

Woodford (1909, p. 509, fig. 1, and pl. 40) gives a good diagram showing the construction of a small canoe or *goa* and of the large *kinu* that has a carving on the top of the bow and stern peaks. There is no keel in either craft, but the two lower strakes are lashed together in the usual manner. In the *kinu* there are "stem and stern pieces" (*dito* or *sito*) which form a sort of keel for the ends of the canoe. Ribbe (1903, p. 52) refers to a keel, 6 to 10 cm high, the sides of which are grooved in order to facilitate the attachment of the planks. Woodford says that Surville (whom he quotes) is incorrect in stating that the "ribs or timbers" are of bent wood; they are either naturally grown or shaped from the solid. Ribbe, who goes into the construction of canoes in some detail, says the planks are bent by water and by heat according to their future position. Woodford refers to "flat representations of faces looking both ways on bow and stern, *vos-ara* or *bos-ara*; if an image carved in the round, *beku*." Ribbe gives illustrations (1903, fig. 9 and pl. 8) of such carvings and of single human figures at the tip of the fore peak.

Ribbe (1903, pp. 52-54) states that the canoes are built so low that the crew must either crouch or so sit on a thwart that their legs are stretched out in front. The craft vary in size from one seat to fifty, are strongly made, and travel rapidly. In recent times certain inconsiderable innovations have been made. Great ceremonies attend the beginning and finishing of a canoe. Before a large canoe is begun some people must be sacrificed. If no slaves are handy then expeditions must be made to Bougainville or Choiseul. Human sacrifice must also be made at the felling of the trees and at the laying of the keel. At the laying of the keel friendly clans are invited to a feast. [Whatever may have happened in the past, these sacrifices have long been suppressed.]

Small canoes are individually owned, larger ones belong to a family or clan. They are looked after with great care and there are canoe houses for the largest. Canoe houses occur in almost all parts of the Solomons and are strictly taboo; but this is not very strict on most of the Shortlands as women may enter the canoe houses, though they may not voyage in a war canoe. In New Georgia, San Cristoval, and Malaita women must make a great detour to avoid passing between the canoe house and the sea (Ribbe, 1903, p. 55). Guppy (1887, p. 71) says:

> "At Alu and Treasury in Bougainville Straits, the tambu-house, which is such a prominent feature in the villages of the eastern islands, is represented by a mere open canoe-shed, for the most part destitute of ornament, and apparently held in but little veneration . . . In the island of Faro, the canoe-houses are only temporary sheds built over the large war-canoes, and can have no sacred character in the mind of the native, the tambu-houses in the two principal villages having no connection with the war-canoes."

Ribbe (1903, p. 192) gives the following terms: ship, *canegaskuner* [kanaka schooner]; boat, *canu booti*; canoe, *canega*; paddle, *wose*; mast, *tegesena*; sail, *sail*. Friederici (1912, p. 304) says that of all the terms connected with sailing collected by him in the Shortland Islands, it seemed to him that only the Alu *tegesena* and the Awa *tekesena* for "mast" are indigenous words.

A large plank canoe (*muro*) was seen by Friederici (1912, pp. 303-304) at Alu:

> It had two masts and sails and 23 men on board. The seats were 30 cm below the gunwale; though this greatly increased the stability, it made the paddling more difficult and gave an ungainly appearance. A central ridge extended for almost the whole length of a plank along its inner surface. Seats (*naonau*)—in this canoe there were seven of them—rested loosely fore and aft on the second plank from below, and amidships on the third plank; each consisted of two pieces of wood placed side by side. They lay 20 to 30 cm below the gunwale. The rib-pieces (*tsiu*) in the bow had the form of a narrow pointed arch, but amidships they formed a shallow flat arch; they did not reach the gunwales. There were a keel-plank and five strakes on each side, and a very high peak at the ends. The planks were often joined together by rabbets. The heads of the rib-pieces of some canoes were decorated with carving.

In all details, however, it is seen that this craft formed the model for the New Ireland *mon*. The *goa* is a smaller type; the plank canoe of Awa is called *ngoa*.

Formerly the canoes had no sails; latterly sails of cotton stuff, unknown in the youth of the old islanders, have come into use. Sails appeared in Queen Carola Harbor, northwest Buka, in 1890; they were unknown in the Shortlands in 1885, but were common by 1888. As a rule they were copied from the European spritsail (Parkinson, 1899, p. 32). Guppy, who was there in 1882-84, says (1887, p. 149): "The large canoes, in crossing from one island to the other in the Straits, employ often a couple of small lug-sails which are made from calico or light canvas obtained from the traders. I never saw any sails of native material." He points out "that in 1792, when Dentrecasteaux approached close to the west coast of the Shortland Islands, he noticed 'large canoes under sail.' "

BOUGAINVILLE

Not much information has been published about the outrigger canoes of Bougainville. Friederici (1912, p. 303) says that at Teperoi (Numanuma) on the east coast they are strikingly long and narrow, the sides tumble home, and the upper edges are broadened and thus recall the strengthened rim of the *kaleu* of New Hanover. There are no seats. He does not refer to the outrigger.

The outrigger canoes of the extreme north of Bougainville are similar to those of Buka and have the same type of outrigger apparatus (fig. 72). Miss Blackwood in 1930 saw canoes made at Kurtatchi which were like those of Petats Island, but the canoe terms are different: canoe, *tchiniv*; hook at either end of the hull, *tchitchio*; boom, *waner*; connective, *ke*; float, *ag* or *woga*; paddle, *owes*. According to a legend, the first outrigger dugout was made by a Hahon man who lived on the top of a mountain and taught the people of north Bougainville how to make canoes for themselves.

Photographs by De Rautenfeld taken at Cape Laverdie, northeast Bougainville, show elegant canoes with sharp raked ends and an outrigger apparatus of the Buka type (fig. 72).

At the south and southeast coast of Bougainville, Ribbe (1903, p. 226) notes that the peaks of the *mon* were distinctly lower than in the Shortlands, and he refers to the angular notch at the apex. He was the first to record the fore and aft washboards, and he compares the canoes in these respects with those of New Britain. The paddles have not the round or heart-shaped blades of those of the Shortlands, but a long blade similar to that of the paddles of Kieta (Gieta) on the east coast of Bougainville and in New Ireland and New Britain. They are painted in red and black on a white ground, the chief motives being human figures in the most remarkable attitudes (1903, pl. 4). The Kieta people do a large trade in these paddles.

A change in the character of the plank canoe was noticed by Friederici (1912, p. 303) at Teperoi. The strengthening of the planks ceases, but the eyed cleats persist and the inserted frames, or rib-pieces, of round wood (fig. 71, *b*) begin to approach the type of Siar, southeast New Ireland. The boat, however, with its streamers along the edge of the peak, completely resembles the Buka *mon*. He says that the above-mentioned characters of the *mon* obtain at Buruwe and Iapa in Empress Augusta Bay (Gazelle Harbor) on the west coast. The inserted frames exactly resemble those of Numanuma. He "saw Buruwe paddlers sitting one below and one above, a hint of the development of the upper seats in the *mon* of New Ireland" (1912, p. 303).

Blackwood reports (1935, pp. 359-382) that the natives of the extreme north, as well as those of Petats, say that the art of making the *mon* was learned by them from the men of Lontis, the north coast of Buka. The people of the Saposa Islands and of Tiop Island do not make *mon*, and *mon* are said to be absent some way down the east coast. She gives an excellent illustrated account of the construction of a *mon* at Kurtatchi, a village at the extreme north of Bougainville.

The various sizes of *mon* have their appropriate names according to the number of seats (*poan*). A seat is a loose board laid on an inserted frame (*mapo*). A canoe with three (*pokukan mon*) is usually employed for bonito fishing. At each end braces (*bebekil* or *kowara*) served with *asam* (the tough outer skin of *Lygodium*) are tied to cleats to keep the planks in position. On gala occasions the *lamut* are ornamented with dyed streamers.

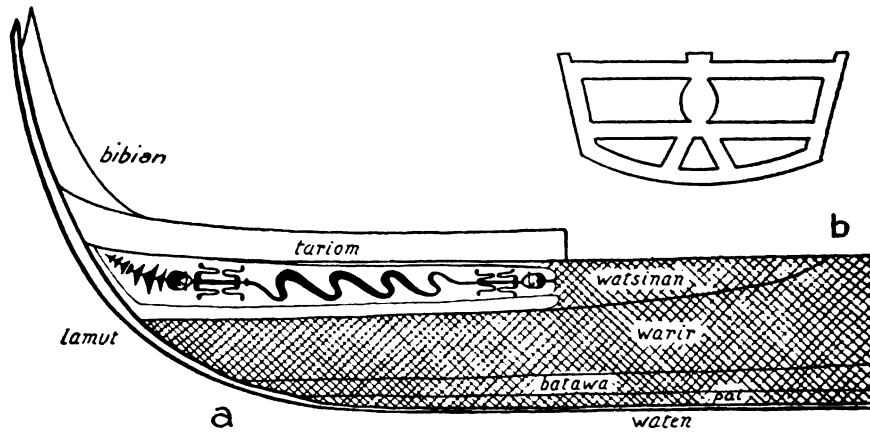

FIGURE 71.—Bougainville canoes: *a*, fore end of a *mon*, Kurtatchi village, at the extreme north of Bougainville (based on information supplied by Miss Beatrice Blackwood); *b*, inserted rib-frame of round wood of a *mon* at Teperoi, Numanuma, east coast of Bougainville (after Friederici, 1912, fig. 114). (*Warir* should be written *warin*.)

On the keel plank (*waten*) (there is no sharp keel) are placed on each side a garboard strake (*pal*), and a second plank (*batawa*). For large *mon* another strake (*wagin*) is added. Then the long bow- and stern-keels (*lamut*) are fixed to the ends of the strakes. All these planks lie nearly flat and are submerged when the canoe is afloat. Next to be added are the *warin*; the fore upper edge of this is cut away for the attachment of another plank, the *watsinan*, which commonly is decorated with a zigzag design. On this is placed the washboard (*tariom*) and above this a vertical board (*bibian*), which is fastened to the *lamut* except at the top, where it is cut away. It is said that at first the people of Lontis made the *mon* without a *bibian*, leaving the *lamut* free, but a Hahon man from the mountainous district of the north of Bougainville introduced this modification. (See fig. 71, *a*.)

Rafts of the Telei tribe, Buin, south Bougainville, according to photographs taken by E. W. P. Chinnery, consist of five logs, the longest in the middle and decreasing in size laterally. The single paddler sits with his legs stretched out and in front is a rack composed of a single bar supported at each end by a vertical and an oblique stick. Parkinson (1898, p. 32) refers to rafts, in the northwest Solomons, composed of three or four tree trunks side by side, pointed at both ends, and fastened together with pegs of hard wood. They are used for small trade and for fishing on the reefs.

Blackwood was informed that originally the people on both sides of Buka passage had rafts (*u amine,* Petats; *panots,* Kurtatchi) but no canoes.

BUKA

Finsch (1909, p. 375) gives a detailed account and excellent illustrations of a *mon* from "Buka" of which Friederici (1912, p. 298) says the cleats and fastenings agree in every respect with those of the Lamassa *mon*; but Graebner (1913-b, p. 114) says that the locality can not be depended upon as the decoration is characteristic of the middle and southern Solomon Islands and not of Buka.

The mixed population of the small islands of Hitau, Pororan, and Petats, which lie off the west coast of Buka, have been briefly described by Chinnery (1927, vol 1, p. 63). The two types of canoe in these islands and on Buka are:

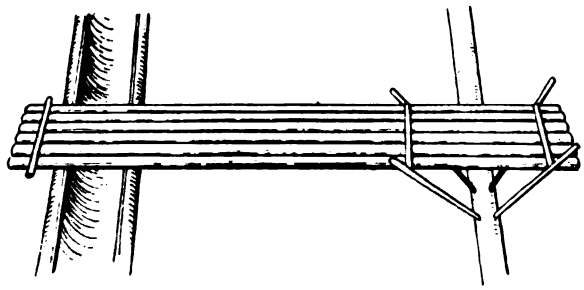

FIGURE 72.—Outrigger apparatus of a Buka canoe (after a photograph); the *sokau* is not shown (see Blackwood, 1935, fig. 17).

1. The plank vessel (*muna*), a typical *mon* with curved high bifid ends and so broad that two men can paddle side by side; a double-banked *mon* is illustrated by Labillardière (1811, pl. 43). Chinnery sent me some notes and gives photographs of the *mon* of Buka Passage (1927, pls. 38, 39) which are very similar to that of Meyer and Parkinson (1900, pl. 41). See also Schnee (1920, vol. 3, pl. 180).

2. The dugout with an outrigger (*jinih, chini* or *sene*) is slender and comes to a point at each end from which depends a short spur termed "hornbill" in the local languages. It ranges in size from one to hold two people to one that will accommodate four or more persons, but these are not common. The outrigger apparatus is amidships (fig. 72). It consists of two long booms (*kikilin*) a short distance apart and resting on the gunwales to which they are lashed and also to a stick (*sokau*) that passes right through the hull a short distance below each boom; Blackwood (1935, p. 365) refers to a third stick for the central pole of the platform. The long narrow platform consists of transverse poles (*kikilin*) which lie tightly packed between the booms and are of the same length; they are braced by crossbars at each end and where the inner connectives are lashed, and there are other crossbars. The platform extends for a short distance on the off side. This is the characteristic "Buka platform". The slender pointed float (*halas*) is less than half the length of the hull. The attachment consists of four long hard wood connectives (*ki*), of which there are two on each side of the platform. Each connective diverges widely from the other; below they are inserted into the float and above they are lashed to the sides of the platform and to the crossbars.

Blackwood (1935, pp. 359-369) gives the construction of a canoe in great detail. The tree which is preferred, as being soft and easy to work, is full of holes made by insects that require filling with putty nut (*Parinarium*). The hull is painted white with *mo,* a calcareous alga. Valuable freight is placed amidships on the platform. A good deal of water is shipped even in a smooth sea, so the hold has to be continually bailed with a half coconut shell. Sails are sometimes employed, but these have been copied from European craft. The use of a coconut or a sago leaf as a sail is still in vogue. Paddles are called *hos* or *hause.*

This type of canoe occurs all around Buka and extends to the extreme north of Bougainville. It has been taken by Buka people to Kilinailau (Carteret Islands).

Friederici (1912, p. 298) gives a sketch of an elegant raft (*polats*) at Soa, on the east coast of Buka, which is composed of four squared timbers pointed at each end and joined by three pegs driven into their contiguous sides. He draws attention to another kind of raft of which the balks are bound together externally.

NISSAN ISLANDS

The Nissan group (Green Islands, Sir Charles Hardy Islands) comprises Nissan, Pinepil (Pinipil), and one or two neighboring islets. They are all coral islands. Nissan forms an almost continuous ring which surrounds the lagoon; immediately north of it lies the semi-annular Pinepil.

Although these islands are here considered as the most northern of the Solomon Islands, it would perhaps be more logical to regard them as belonging to the marginal islands and thus they would come between Kilinailau and Tanga.

The ethnography of these islands has been described by Krause (1907, pp. 44-159, with numerous illustrations); he gives a full bibliography.

Chinnery informs me that the population of Nissan atoll is mixed; some of the natives are slight and light-skinned, others are dark-skinned as in Buka. Krause (1907, p. 48) says that the legend of the immigration of the inhabitants of Nissan from Buka confirms scientific investigation, and recent information shows that this process is still gradually continuing. Whether the future will be able to confirm the legendary Polynesian substratum is uncertain. Present trade intercourse comes less directly from New Ireland than from the outlying islands of Anir and Tanga and therefore passes near the old home of the legendary original inhabitants. There may yet be found traces of the legendary migration, but at present the physical characters of the people, and still more strongly their culture, reflect the modern trading relations.

The following information is taken from Parkinson (1899), Krause (1907), and Friederici (1912, pp. 297-298). The usual craft for all voyages in the lagoon for fishing, trade, or visits are outrigger canoes, for which Krause gives Uhlig's term *mammbu*. The double outriggers were mentioned by Parkinson (1899, p. 32) but first described by Krause.

The double outrigger canoe (*kop*) is the common form (fig. 73). It is a narrow dugout, the opening is so constricted that one leg of a man must be placed in front of the other. Both ends are pointed; holes are bored in the gunwales for two booms which are from 2 to about 5 meters long and 3 to 4 cm in diameter. On each side a float (*haman*), generally of bamboo, is lashed to the ends of the booms. The whole outrigger is very frail (Krause, fig. 101).

Friederici gives a sketch (fig. 73, *b*) of the bow of a *kop* which has a squared shelf and a depending triangle; he says the floats (*neaga, niag*) are usually of bamboo, but the booms (*haman*) are of light wood. He calls attention (p. 296) to the reversal of the terms for boom and float, and it will be seen that Chinnery also obtained these reversed terms. The bamboo bailer (fig. 73, *b*) is in "Polynesian style." In a letter to me Friederici says that he is convinced that the *kop*, which now persists only in Nissan, has been brought by a Philippine or sub-Philippine migration to New Ireland and its neighborhood, the double outrigger there having been replaced in course of time by the Melanesian single outrigger.

The single-outrigger canoe (*tsine*) is a dugout with two to four strong booms which pass through both sides of the hull (Krause, fig. 102). The float is oval

in section (20 by 40 cm), 2 to 2.5 meters long, and pointed at each end; it is attached to each boom by two sticks. Parkinson (1899, p. 32) says that these canoes are of all sizes from a few meters long to hold one person to those of sufficient size to carry five or six persons. The larger ones usually have a platform of sticks laid close together longitudinally. This is built on the booms, and on it there is often a small quadrangular basketwork receptacle for food, etc. Most of the canoes are plain, but some have a few black and red geometrical designs not very carefully painted on stem and stern; others have a painted representation of a bird, others again a grotesque human figure in flat relief as is so characteristic of the northwest Solomons. The crew sit singly one behind the other and alternately paddle, one on the left side and the other on the right.

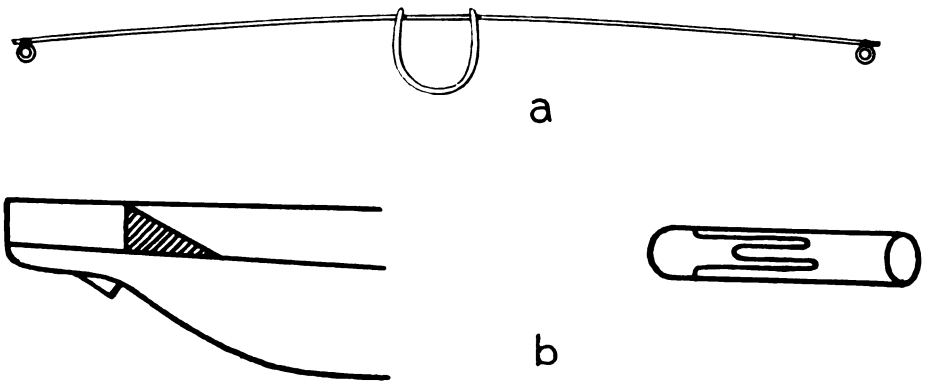

FIGURE 73.—Double outrigger canoe (*kop*) of Nissan: *a*, section (drawn by Dr. Georg Friederici); *b*, bow and bamboo bailer (after Friederici, 1912, figs. 96, 97).

Krause (1907, figs. 103-105) describes and illustrates the paddles (*walli*). The grip has no crutch and the narrow blade is leaf-shaped and runs to a fine point. They are often painted in the manner characteristic of Buka and north Bougainville, with a human head or figure. Parkinson (1899, p. 33) calls the head *kokora*.

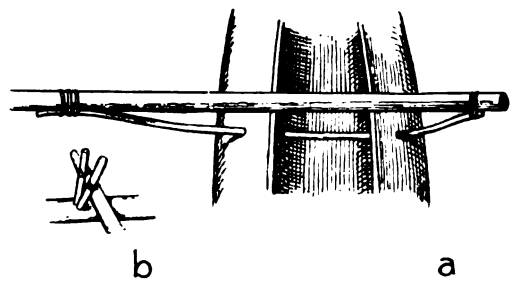

FIGURE 74.—Details of a single-outrigger canoe (*tsine*) of Nissan: *a*, bracket-spar; *b*, connectives (from drawings by Dr. Georg Friederici).

Parkinson (1899, p. 32) says that formerly the canoes had no sails; latterly sails of cotton cloth, unknown in the young days of the islanders, have come into use. Their first appearance in Queen Carola Harbor, Buka, was in 1890 and they were unknown in the Shortlands in 1885, but were common in 1888. As a rule they were copied from the European spritsail.

Friederici (1912, p. 298) says the *tsine* is essentially like the Buka outrigger canoe, but lacks the Buka platform, and the two very long booms show Polynesian influence. The float shows the Carteret [Kilinailau] form. The two connectives are thin and fragile, but his drawings show that these connectives are small sticks inserted into the float (fig. 74, *b*); they diverge from each other and are fastened to one side of the boom. He illustrates a bracket-spar (*kisiu*) which passes through two opposite holes in the hull and has its ends lashed to the boom (fig. 74, *a*). Friederici has informed me that the single-outrigger canoes of northern Bougainville have a similar bracket-spar, but here there are no canoes with double outriggers.

Krause (1907, p. 134) states that these canoes are very light and fast, but that they are less employed than the double-outrigger canoes. Both kinds suffice for the tranquil water of the lagoon and also for short coastal voyages, but they are not suitable for the open sea as the outrigger is easily broken by the force of the waves and the hull ships seas. The single outrigger is more resistant than the double. The analogue of the customary Buka boathouse appears in Nissan in a kind of shed (*tak*) for the larger boats (Parkinson, 1887-88, p. 241).

Meyer and Parkinson (1900, pl. 39) give a photograph of single-outrigger canoes at Pinepil, an islet immediately north of Nissan:

> The bottom of the dugout hull slopes gently up to the bluntly pointed ends, the upper edge is horizontal; the hollowing of the hull ceases at some distance from the ends. This canoe has three widely spaced booms which rest directly on the gunwales. The float is slender, sharply pointed, and much shorter than the hull. The attachment of each of the outer booms apparently consists of two diverging sticks, like a narrow V; they have a common origin from the float and the upper ends are lashed to one side of the boom. The attachment of the central boom consists of two vertical sticks, one on each side of the boom. There are several stringers across the booms, the two outer of which are secured respectively to the inner and outer attachment sticks of each boom. There is no definite platform.

A photograph of a Nissan canoe (*sini* or *tini*) and sketches made by Chinnery show many variations (fig. 75):

> The hull photographed is sharply pointed and raked at each end. There is a large washstrake and flattened triangular transverse end-boards curve fore and aft respectively. The two booms extend for some distance on one side and much farther on the other. One sketch of a dugout (*hawawan*) shows a *kisiu* under a boom (*haman*). The float (*folas*) is flat, pointed, and raked at each end. The attachment consists for each boom of what appears to be a pair of widely divergent Y-sticks, the boom passing between the fork of each Y.
>
> The connectives (*dok*) are so varied in form and disposition that it would be tedious to describe them; they consist of vertical sticks, oblique sticks, undercrossed sticks, and Y sticks, separately or in combination. A thin rod that passes beside the attachments and has its ends lashed to the ends of the float (fig. 75, *g*) recalls a similar rod at Nukumanu and Leuaniua. A short stick (fig. 75, *e*) that passes under the crossings of undercrossed sticks and has its ends tied to the boom has its analogue in the *bulen* of the Hermit Islands canoe. Probably for the sake of clearness Chinnery has omitted from his sketches many of the lashings. The lashings of figure 75, *a* and *b* are not found elsewhere, so far as I am aware, nor is the bent stick (fig. 75, *f*). There is greater variability in the connectives of the Nissan canoes than in any other island of Oceania, which indicates that this island has been reached by several cultural drifts. There is a bamboo bailer (*lima*) (fig. 75, *n*), but Chinnery refers to "other bailers of coconut matting". The paddle is called *wali*.

Friederici (1912, p. 297) points out that the double-outrigger canoe, with its Indonesian name, is a relic of a former Indonesian or Philippine colony which may have continued on the remote Nissan after it had disappeared from the mainland of New Ireland. It has thus undergone the same process after the conquest of the island by the Buka people as did the Polynesian canoe of Kilinailau.

The large boat without an outrigger (*mon, mona,* or *mahn*) rarely occurs in the Nissan group. Krause (1907, p. 131) saw about six at Nissan and four at Pinepil. A *mona* which carried up to 30 persons was 20 meters long and 1.5 meters broad and made journeys to Pinepil, Aneri, and Buka. These boats are of the same type as those of Buka and north Bougainville. Some are purchased from Buka and some are made in Nissan. Krause describes them as having a keel and thin bow and stern keels (*bebian*); a plank is too short to extend along the length of a canoe, so two or more have to be used; the peaks are low.

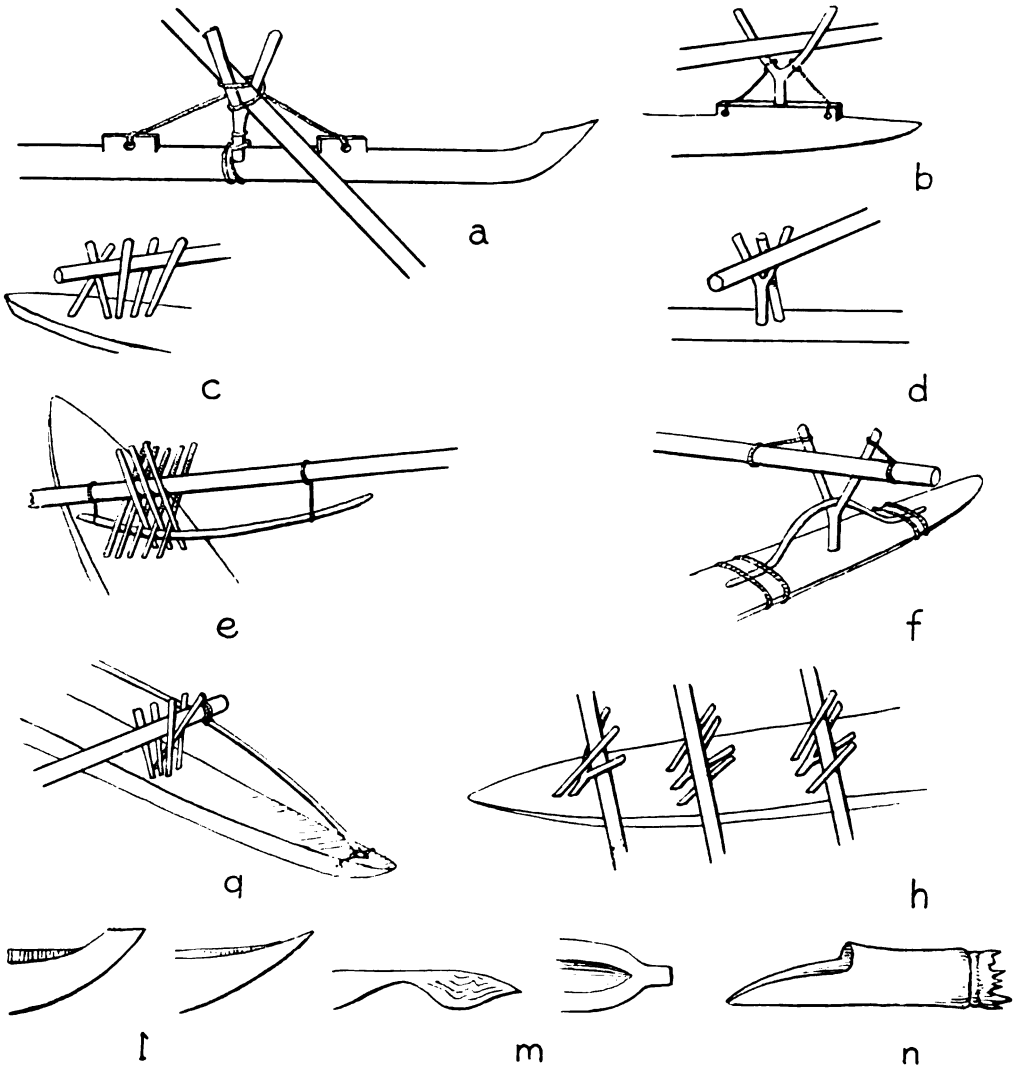

FIGURE 75.—Details of *sini* of Nissan: *a-h*, various types of attachment; *l*, side of two bows; *m*, side and upper surface of a bow; *n*, bamboo bailer (sketches by E. W. P. Chinnery).

Friederici (1912, p. 297) says that the *mon* of Nissan has the same form as that of Buka, but shows a few characteristic peculiarities of the *mon* of Lamassa (extreme southwest of New Ireland)—for example, in the more worked-out eyed

cleats, and in the seats being above and not within the hull. He adds that one can say without doubt that the *mon* of New Ireland is a descendant of the *mon* of the Solomons. Elsewhere he gives evidence that the latter is probably derived from the Moluccan plankboat (*orembai*). The *mon* types are "very numerous" in Nissan.

Krause (1907, p. 134) refers to two kinds of raft at Nissan: one composed of 10 to 12 bamboo poles about 4 or 5 meters long which lie close together and are lashed to 3 or 4 underlying transverse poles fastened with *mallisch*; the other is made of 3 to 4 trimmed tree trunks about 3 to 4 meters long. The rafts are used only for fishing in the lagoon by men and women who do not own boats. He adds that Parkinson (1887-88, p. 240; 1899, p. 32) describes a similar raft for Buka. They are about 0.5 meter broad and 4 to 8 meters long. The paddlers sit on the raft and let their legs hang on both sides in the water.

Friederici (1912, p. 298) saw at the boat park at Halian, Nissan, five *mon*, two outrigger canoes, and two rafts (*xavot, wamine*) consisting of 6 to 7 bamboos of fairly similar length bound by three wooden laths.

BISMARCK ARCHIPELAGO

NEW IRELAND (NEU-MECKLENBURG)

In my account of the districts of New Ireland I follow Friederici in the main, and I refer to them in this order: 1, In south New Ireland are Siara district, Muliama district, Anir Islands, and Tanga Islands. In southwest New Ireland are the Duke of York Islands, the Gazelle Peninsula (Blanche Bay), and Watom Island of New Britain, the Laur district and the Lihir Islands. 2, Central New Ireland consists of the Schleinitz Mountains district, Nayama district, Hamba district, Tabar Islands, Panamego-Fesoa district, Lemusmus district, and the greater part of Dyaul Island. 3, Northern New Ireland, or the Nusa-speaking district, contains the extreme west end of New Ireland, the western end of Dyaul Island, Lavongai (New Hanover), and the intermediate islands.

Chinnery (1931, no. 6, p. 11) has made a demographic survey of the native population of the east coast of New Ireland and he finds that in the area investigated there are three main linguistic groups (numbers in parentheses are the miles distant from Kavieng): 1, languages along the coast from Karu (147), which is near the eastern boundary of the Schleinitz Mountains area, to Fatmilak; 2, those from Fatmilak to Kavieng at the extreme north; 3, bush languages which are purest among the Limalaua who live in the bush and on the coast near Fatmilak. The dialectic groups of 1 are: Fatmilak (69.5) to Munawai, Lakurumau (48)—said to be different from the others, Luburna (46) to Laowan, Livitua (28) to Mangai, Losuk (25) to Kavieng. Chinnery (1931, no. 6, p. 28) says that in many places the coastal people go into deep water in canoes to catch sharks by the noose and rattle method. These expeditions are attended with considerable magical preparation, and representations of sharks are carved on the canoes.

SOUTH NEW IRELAND

According to Friederici's map (1912), which is based on Sapper's, the southern district of New Ireland extends from Danfer River, about 4° 5′ S., west of Cape Assu (Cape Santa Maria or East Cape) on the north coast, and around the south end of the island to just north of Cape Tambakar on the west side at about 4° 10′ S. The coastal area on the east is known generally as the Siara district.

The Nissan Islands lie due east of Siara village, and the village of Likiliki is to the south of it.

Stephan and Graebner (1907, map, p. 12) call the coastal region from Danfer to Cape Narum, which is north of Siara village, Maiat; the coastal region thence round Cape St. George to just below Kait village on the west coast, Pugusch. From Kait to just north of Cape Tambakar is the Kandass district. Friederici (1912, p. 290) declares that these three areas are neither ethnologically nor linguistically correct and should be removed from maps and literature.

The people of the coastal and low lands of the northeast part of the Gazelle Peninsula of New Britain are essentially the same as those of the Duke of York Islands and of the Laur district, and those farther south in New Ireland. These invaders pushed back the Baining who formerly extended over the whole of the peninsula; the Baining, who are a primitive people and speak a non-Melanesian language, do not concern us here, nor do other inland tribes. Parkinson (1907, p. 49) says that some of the immigrants went westward to the north coast of the peninsula and settled in the islets west of Ataliklikum Bay. They, like the kindred tribes of Cape Livuam, Weber Harbor, and the islands of Urora and Watom, have always been enterprising seafarers.

SIARA DISTRICT

Rivers (1914, vol. 2, p. 542) points out that the peoples of the east coast of south New Ireland share with those of Anir and Tanga a culture which differs decidedly from that of the rest of south New Ireland.

Biro (1905, p. 61) saw in the southeast of Siara in 1900 small dugout canoes (*e oan*) made of soft wood exactly like the Herbertshöhe (Gazelle Peninsula) form. The hull (*mapo*) has an opening so narrow that the paddlers on the short seats (*paneti*) have to put one foot in front of the other. The sides are vertical and there is no carving or painting. The two booms are called *palilon* and the float, *palaj*.

It may be inferred that the distal ends of the booms are forked and that for all the booms the forks are embraced by a clamp connective.

The Muliama linguistic district of Friederici extends on the north coast from Danfer to a short distance west of Cape Sena at about 152° 55′ E. The Anir and Tanga Islands belong to this cultural area and to that of the northern part of the Siara district. Parkinson (1907, p. 261) says that Tanga and Aneri (Anir) folk have for many years founded a colony in the Siara district about 8 sea miles south of Cape Santa Maria and down the coast for about 10 miles. The people of both island groups maintain a friendly trade with Siara, whereas they are more or less at war with all their other neighbors. They also form a bridge for trade with the Nissan Islanders and through this with the Buka and Solomon Islanders.

ANIR GROUP (FENI ISLANDS)

Parkinson (1907, pp. 250, 302) refers to the Anir Islands as the small group of St. John, which is called Wuneram by the Solomon Islanders and Aneri by the people of the neighboring coast of New Ireland. Friederici calls them Anir. The natives call the larger island Ambitle and the smaller one Babase. Parkinson (1907) says that the Tanga people refer to the islands as Finni. This appears to be the origin of the Australian official name of Feni.

Chinnery (1927, p. 61) says, "The people of Anir (Feni) may be divided into two main groups, those of the north, Babisa, who use canoes, and those of the

south who do not use canoes." I have no information about the canoes of these islands.

Friederici (1912, p. 295) gives *got* for the bamboo raft used in Anir.

TANGA GROUP

The eight small islands of Tanga were discovered by Tasman in 1643 and named by him Anthony Caens, but Brigham (1900, p. 82) calls them Kaan. Parkinson (1907, p. 250) terms them the Caens Islands and gives the individual names of several of them. The most northern one is Tanga, and this is the official term for the group. As previously stated, these islands may be regarded, so far as the canoes are concerned, as marginal islands.

The only information available on the canoes of the Tanga Islands (fig. 76) consists of a few notes made by Chinnery (1927, p. 61; and MS) at the village of Lif.

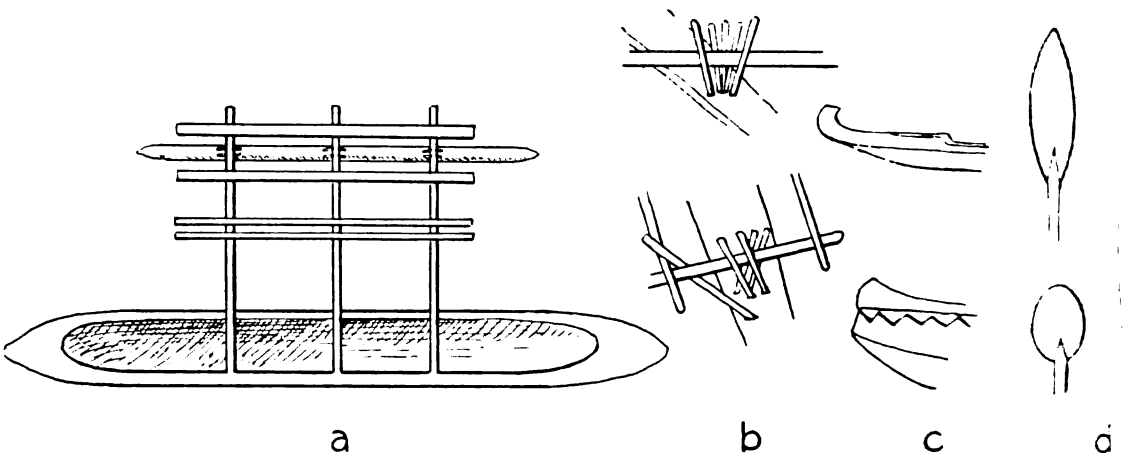

FIGURE 76.—Canoe (*wang*) of Lif, Tanga Islands: *a*, plan; *b*, two varieties of attachment; *c*, two forms of bow; *d*, two types of paddle and section of a paddle (sketches by E. W. P. Chinnery).

The canoe (*wang*) (fig. 76, *a*) is a dugout with a washstrake; the fore end-piece (*bukau*) may be recurved. There are usually three booms (*samu, magu*) which are attached to the float (*aisam*) by sticks (*saman, assam*). One sketch shows two divergent sticks on one side of the boom and three more or less vertical sticks on the other side, but doubtless the details vary. There are two stringers (*luf*) close together across the middle of the booms, one on the booms just inside the attachments, and another running outside the attachments. There is no platform on the canoe.

Chinnery made a rough sketch of a float attached to each of the two booms by two slanting parallel sticks on each side of the boom and one large stick inserted into the float and slanting inward to be lashed to the junction of the boom and the inner *luf* (fig. 76, *b*). Other sketches made by Chinnery show that the paddles (*fis*) usually have elongated narrow blades, though some are almost round; the paddles are slightly curved longitudinally.

More canoe terms from Tanga are: forward, *mata*; aft, *mi*; seat, *balkinis*; bailer, *tata*.

A photograph of a Lif canoe (fig. 77) shows that there is a small end-piece with a short vertical projection at the bow. Each of the three booms is attached

to the float by two parallel sticks on one side and a single stick on the other, which passes on the outer side of the other two; they cross under the boom. A connective which slants inward is inserted into the float below each boom and is lashed to the boom some distance from its end. There are four stringers side by side at the center of the booms and one stringer immediately outside the attachments.

Friederici (1912, p. 295) gives *a nsoak, ngot* as names for the bamboo raft of Tanga.

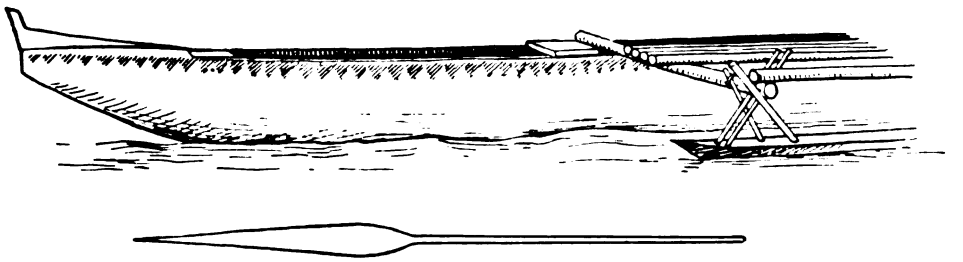

FIGURE 77.—Canoe (*wang*) of Lif, Tanga Islands, fore part of canoe and paddle (after a photograph by R. H. Vigor).

THE MON

The *mon* of south New Ireland occurs in small numbers from Lamassa at the southwest end to the whole of the Kandass district, in the Duke of York Islands, and is found sporadically in the neighboring areas.

Powell (1883) says that the people of Weira, Duke of York Island, are great travelers in canoes which differ from the small coasting ones in having no outrigger. He describes briefly the *mon* which he saw in 1877 and is of the opinion that "the natives must have learnt the art of building them from the Solomon Islanders."

Friederici (1912, pp. 293, 294) states that up to about 1885 the New Ireland *mon* were manufactured at Siara, Muliama, and Nokon. The plank boats which Powell (1883, p. 168) saw in the Duke of York Islands and probably also those of Schmiele's time (1891, p. 109) were derived from Siara. Up to this time none of the people from Lambon to King knew how to make a *mon*. All *mon* came to them from Siara, particularly from the Mimias district (north of 4° 30′ S.). At the present time Lambon, Lamassa, and King are the chief places of the *mon* industry, whence are exported good vessels not only to Mioko and the Gazelle Peninsula, but to Siara which was formerly the source of supply. *Mon* are made at a few other places on the west coast. On the east coast the art of constructing a *mon* extends or extended as far as and including Nokon. The people of Kudukudu, on the extreme west border of the north coast of Nokon, buy *mon* but do not make any. Farther north the plank boat makes only a sporadic and casual appearance.

Stephan and Graebner (1907, pp. 80-85) say that while almost every man in south New Ireland can make a dugout for himself, the making of a *mon* requires special workmen. They say:

> The keel plank is twice as thick as the other planks; on this the planks are laid symmetrically on each side. The bottom strake is lashed to the keel plank in the same manner as the strakes are fastened to each other; the stem of a species of fern (*wassom, Lygodium*) is used for this purpose and for other fastenings. The construction of the hull is done on a framework in a special boathouse. Each plank is first bound at one end to the preceding plank and then by means of *kandass* (rattan) lashings from the walls of the house and from the frame-

work it is so warped that it lies with its lower edge exactly against the preceding plank. Further small improvements are made and when it has taken on its final form it is bound to the plank underneath. The binding is not done by means of a continuous lashing as Ribbe (1903, p. 51) described for the Shortland Islands, but each pair of holes is lashed separately. The arrangement of the planks is described and the names of the several planks are given.

Biro (1905, p. 58, fig. 1) describes a canoe from the southeast coast of Siara as built of small irregular pieces of wood sewn together. Stephan and Graebner deny that the *mon* have this patchwork construction. Possibly Biro saw a *mon* which had been mended, though even this could scarcely have assumed the appearance that he describes.

There are six planks on each side, which run from stem to stern excepting the second from the top which is only three fifths the length of the canoe and is absent in many of the older *mon*. The other planks abut with their whole breadth against the stem except the third from the keel which is thinned down to a point, but occasionally other planks may be too short to form a complete strake (fig. 78, *a*). The stem- and the stern-posts (the *Steven*

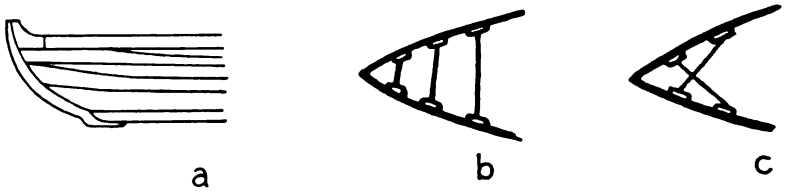

FIGURE 78.—Details of a *mon*, southern New Ireland: *a*, planks at the bow; *b*, braces of *kandass* at the bow; *c*, braces at the stern (after Stephan and Graebner, 1907, figs. 80, 87).

of the Germans) consist of a sickle-shaped piece of wood (*paiar*). Its base (*omnakas*) runs a short distance below the end of the keel plank and serves to lessen the shock when running on the sand (*kas*) (fig. 79, *e*). The planks abut against a thin lath (*matanai*) of hard wood laid along the concavity of the *paiar*. A purely decorative addition (*pakopakon na mon*) (fig. 79, *a*) is fastened to the bow and stern (Stephan and Graebner, 1907, frontispiece, fig. 67, pl. 4, figs. 1, 2; Biro, 1905, fig. 6; Paris, 1843, pl. 116, figs. 10, 11, at Likiliki). It does not contribute to the seaworthiness of the *mon* as does the end-piece of the dugout. In the old boats the *pakopakon* was bound firmly to the left, or port, side of the stem and its base rested on the second plank from the top and abutted against the topstrake. In the more recent *mon* (fig. 79, *b*) a short board is fastened to each side of and beyond the end of the right topstrake, and a small vertical board is fixed on the right side of the end of the *paiar;* thus the *pakopakon* can be removed and replaced at will, for now the people like to use it only while on a voyage; when the *mon* is in a boathouse, the *pakopakon* is removed and carefully kept in the house of the owner. At its summit is an elaborate, perforated, painted carving (*kom*) of varied design. Corresponding to the *pakopakon* a small erection (*erereit*) is inserted on the other side of the bow and on both sides of the stern of the *mon;* it reaches the upper end of the stem- and the stern-post (fig. 79, *c*). The *erereit* and the board above the right end of the *paiar* constitute a sort of end-piece, like that in a dugout, to keep out the sea.

The hull of the canoe is strengthened by means of five rib-frames spaced fairly equidistantly. The usual rib-frame is shaped like a wide U, but there may be bars of various kinds connecting the limbs of the U. They are always cut out of one piece of wood and are fastened to each plank by a lashing which passes through a hole in a protuberance (*batnati, patnati,* Lamassa) which is left when the plank is adzed. Care must be taken to have the eye-cleats of the several strakes in vertical rows so as to be adjacent to the rib-frames. A further stiffening of the boat is insured by the seats, which are placed above the rib-frames and have notches on their ends which fit on the edge of the topstrake. A strong rattan lashing passes around a notch in the center of each seat and is fastened around the center of the horizontal part of the corresponding rib or frame below (fig. 79, *d*). Fore and aft the pairs of converging planks are tied together by a rattan brace which passes through the eyed cleats of the planks (fig. 78, *b, c*). Only when the boat is quite finished are all the joints calked with *Parinarium*.

Each seat accommodates two paddlers, except that of the steersman whose seat is placed over the last rib-piece. The natives paddle up to a rate of 5 sea miles or 9.3 km an hour. Paddles are figured by Stephan and Graebner (1907, pl. 6). As the *mon* ship a great deal of water, especially when they have been drying for a long time on the shore, a number of bailers are provided for each boat.

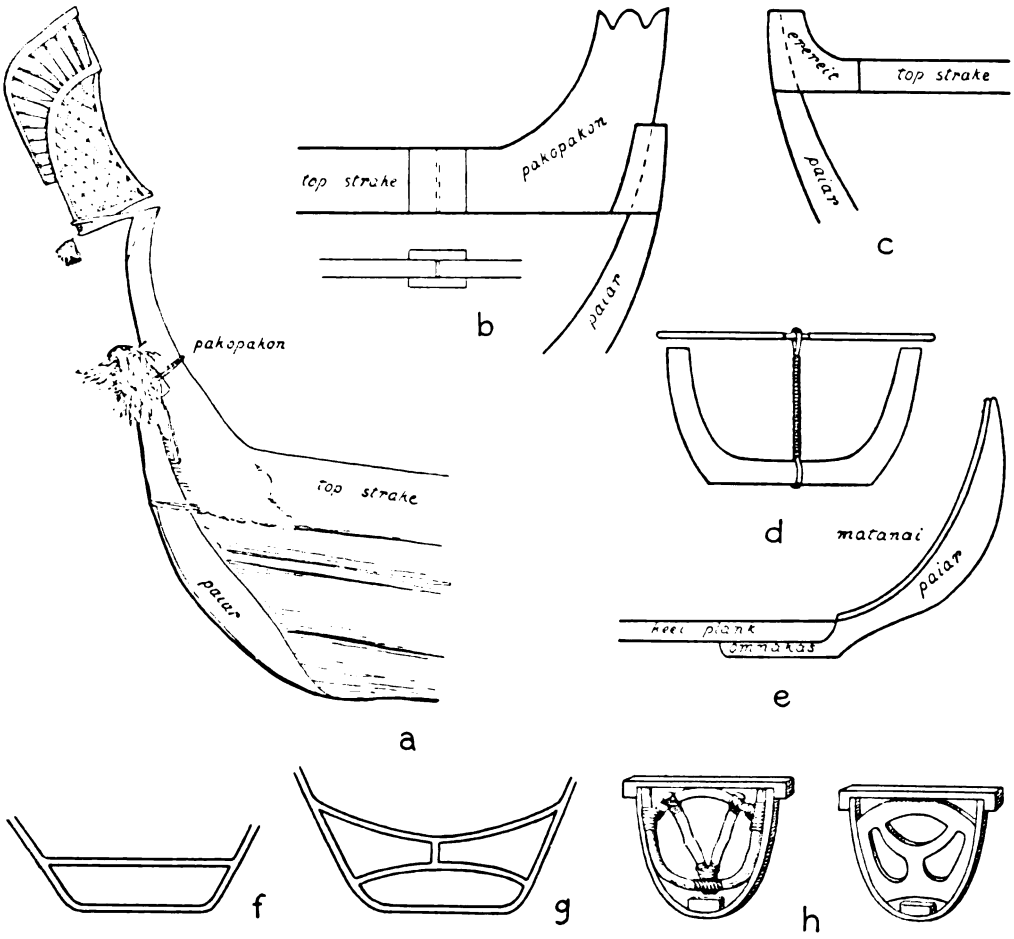

FIGURE 79.—Details of a *mon*, southern New Ireland: *a*, bow of the *mon* of the chief of King; *b*, modern form of bow or stern; *c*, old form; *d*, diagram of seat; *e*, keel and stem-post; *f*, *g*, diagrams of rib-frames; *h*, rib-frames and seats (*a-g*, after Stephan and Graebner, 1907, frontispiece and figs. 82-84, 86; *h*, after Biro, 1905, figs. 4, 5).

Now and then one sees a *mon* with sails of European canvas and ropes which the natives scarcely know how to use. Stephan never saw New Irelanders make use of the wind. He estimates very highly the capabilities of the *mon*. The fact that they do not fall far behind European boats in seaworthiness is proved by the long voyages taken in them. They can travel 40 km in a day whether along the coast or on the open sea between New Ireland and New Britain.

The price of a *mon* is 10 strings of *diwarra* (shell money), and if one is sold another is made only when it is necessary. Stephan was told that originally only the people of Mimiassa and Siara knew how to make plank boats. This indi-

cates that a settlement of the western districts of south New Ireland, if not the very first one, took place from the east.

A number of long, narrow rafts made of a few bamboos tied together and used for fishing are illustrated by Parkinson (1907, pl. p. 80).

SOUTHWEST NEW IRELAND

The best account of the canoes of southwest New Ireland and the neighboring islands is that given by Klüpfell in Stephan and Graebner (1907, pp. 72-85, 222). He says that there are two kinds of craft in that region: the dugout with an outrigger; and the *mon*, which has already been described.

The outrigger canoes range in length from 10 to 26 feet and can carry from one to seven men. The hull (*wagge*, Kalil; *ano*, King; *ab oang*, *wankes*, Lamassa) is alike at both ends and of elegant form. In Laur the canoe is not seen so often, and it is thicker and not so seaworthy. Apart from minor differences there is a great uniformity of craft in this region of New Ireland. The hull consists of the lower part of a well-grown *Alstonia* tree and is now hollowed out with iron-bladed adzes. The strength of the side is tested by tapping with the fingernail. The bow and stern which curve upward do not ship water, and this curve is continued by the additional end-pieces (*pakopakon*).

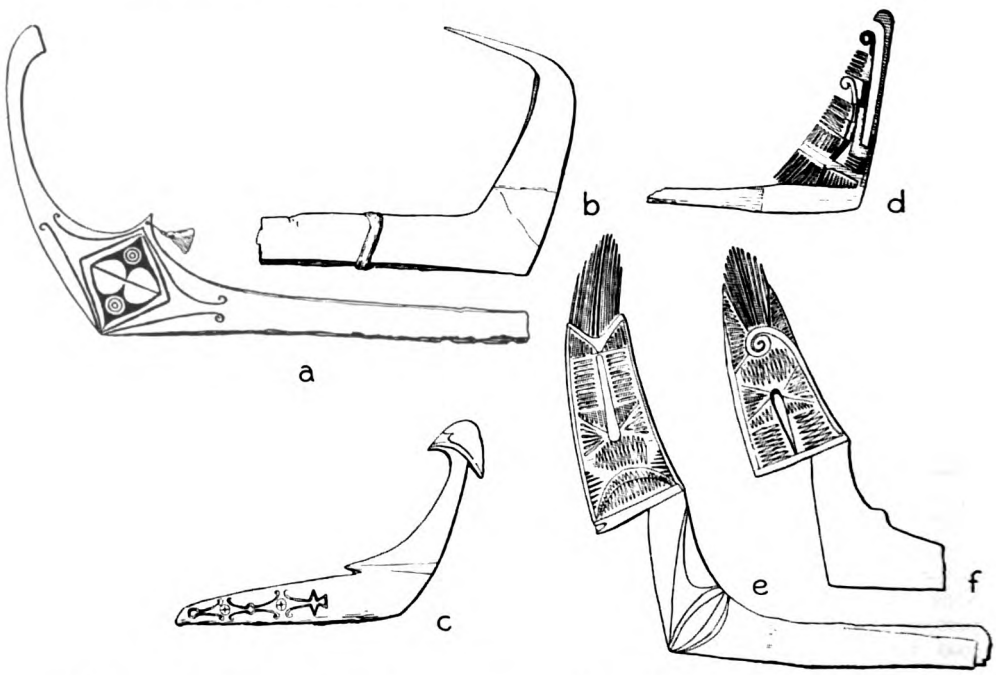

FIGURE 80.—End-pieces of outrigger canoes, southwest New Ireland: *a*, *kuku*, Watpi, where it is called *pakopakon*; *b*, *kie*, Kalil; *c*, *null*, Lamassa, where it is termed *papagann*; *d*, *pakopakon* of a model from Kandass, the top of the separate bar on right represents a man's head; *e*, *f*, fore end-pieces, Mioko (after Stephan and Graebner, 1907, pls. 4, 5).

There are five main types of end-pieces. 1, the *kuku* (fig. 80, *a*) is the most usual end-piece on the Gazelle Peninsula; about one third of the Duke of York canoes had it. On the opposite coast of New Ireland it was rare and was not seen farther north or south. 2, the *kie* (fig. 80, *b*) was seen on one third of the Duke of York canoes and was usual in Laur. It was exceptional farther south and was present on canoes of the extreme south only on Lambon. Stephan and Graebner (1907, p. 158) can not explain this or the occurrence of a slingstone

basket of Laur technique which is found on this southern islet and called *kie* in Duke of York and Kalil, *ponpon* at King and Lambon, and *wara pike* at Balangawang. 3, the *null* (fig. 80, *c*) is used on one third of the Duke of York canoes and is usual on the opposite coast of New Ireland. It is universal at Lamassa and is found on half of the Lambon canoes in common with the *kie*. In both Lamassa and Lambon it is called *papagan* and at King, *balanott*. Parkinson (1907, p. 297) says that the flat kidney-shaped end is painted red, and that it does not occur on Gazelle Peninsula. 4, the *pakopakon* (fig. 80, *d*) is the bow-piece of a model from Kandass district. Similar carvings were obtained at King and Kait. 5, the fore end-pieces (fig. 80, *e*, *f*) are from Mioko of the Duke of York Islands and are said to have been made formerly on the opposite coast of New Ireland.

Stephan (1907) has given an elaborate account of the meaning of the carvings and painting of the end-pieces. Each end-piece is bifid below and each limb extends along the top of the gunwale for about one eighth of the length of the hull, to which it is lashed by means of fern stalks (*Lygodium*). Joints are calked with *Parinarium*. Sometimes a washstrake which joins the ends of the end-pieces is added, but this is not primitive, and was seen in only a few canoes. To strengthen the hull a projecting rim is left during construction along its outer edge.

Another kind of canoe (*choangsamo*) at Lamassa has no end-pieces. The hull is identical to that just described, but along the whole upper edge there runs a thin wooden strip (*totok*; *soantangtang* in Lamassa) which is sewn on, but a space left between it and the hull lets in the water. The lath is found in north New Ireland and in the whole of the western islands of the archipelago with the exception of Maty; presumably it lies over the outrigger booms.

Medium-sized canoes have five booms called *taraba* at Kalil, *tarambo* at Kait, and *jaikorot* at Lamassa (Stephan and Graebner, 1907, fig. 56). They are about 1 meter apart and tied tightly to the edge of the hull with rattan (*kandass*).

The length of the booms is about one fourth to one third of the length of the hull in such canoes. The booms end in a natural fork, to the arms of which the two flat attachment sticks (*turtur*, Kalil; *liss*, King, Kait; *tambalis*, Lamassa) (fig. 81) are lashed with rattan, one on each side; they are tied close together above the fork and their pointed lower ends are driven into the float (*samon*). This is the sole method of attachment in south New Ireland. There is usually a stringer across the booms at about two thirds of the distance from the middle line of the hull to the float.

In medium-sized canoes the round float, about 10 cm thick, is so arranged that when there is a slight load the booms are horizontal and the canoe on even keel. Small unstable canoes have the longest floats, sometimes almost as long as the hull, and they are placed farther from the hull than those of larger craft. In large canoes the float is half as long as the hull or even less.

The outrigger is generally on the port (left) side. In front of each boom is a thwart (*palai*), the under side of which is grooved at each end to fit upon the gunwales, and it thus serves as a stretcher to keep the sides from tumbling home. These canoes are thoroughly seaworthy, but have a limited capacity and no platform. After a voyage the canoe is placed on wooden forks or on the ground and covered with palm leaves to keep off rain and sun, and the end-pieces are wrapped in banana leaves.

The canoes are propelled by paddles (*woss*, Lamassa). Those of Lamassa and Kait have narrow oval blades which run to an elongated point, the blades are decorated with incised and painted designs which are explained by Stephan (1907, pl. 10, figs. 1-6). Every canoe has a rough little bailer (*tolpol*) made of wood or of the leaf of the *Pamos* tree. One bailer from Lamassa is made of bamboo like those of Siara (Biro, 1905, fig. 8).

Friederici (1912, p. 295) gives the following terms for Lamassa and Lambon (L.), King and Kait (K), Nokon and Suralil (N); outrigger canoe, *wan* (L),

ango (K), *takub* (N); boom, *aiai kurut* (L), *terambo* (K), *avarat* (N); connectives, *kabalis* (L), *lis* (K), *hrenkabir* (N); float, *saman* for all; strake, *popon* (L), *tanut* (K); bow and stern addition, *babakan* (L), *pakopakon* (K).

Stephan and Graebner (1907, p. 71) refer to a dugout with carved ends which long ago drifted to a spot near King, which is in their "Kandass District." The crew of the boat were dead. The canoe doubtless belonged to the district of Berlin Harbor on the mainland of New Guinea. The painting (1907, figs. 64, 65) of the carving was done by New Irelanders; the designs are explained by Stephan (1907, pp. 111-114). Stephan and Graebner illustrate (1907, fig. 66) a model of a dugout from Kait, with *kie* end-pieces but with the addition of a bird which is probably a *kie* or *ke*, a nimble sandpiper (*Ceix solitaria*) (Stephan, 1907, p. 12).

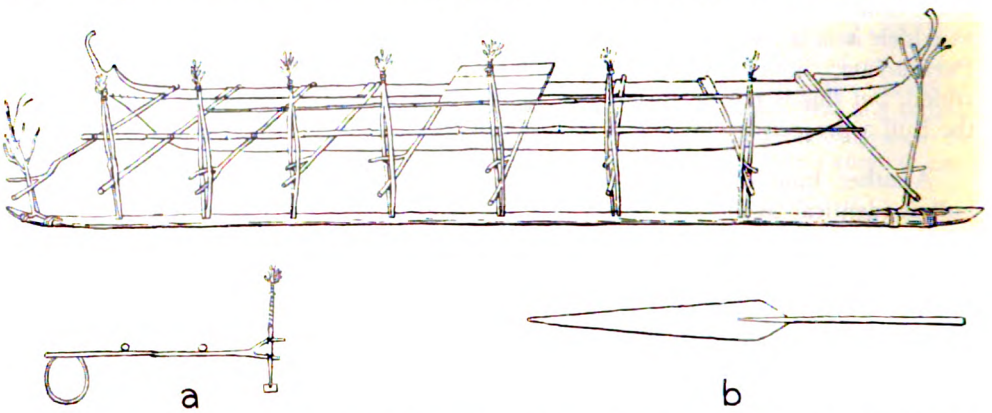

FIGURE 81.—Large outrigger canoe (*waga*), Gazelle Peninsula: *a*, section; *b*, paddle (after Von Luschan, 1897, pl. 34).

DUKE OF YORK ISLANDS AND THE GAZELLE PENINSULA OF NEW BRITAIN

Hunter (1793, pl. p. 237) gives a drawing of an outrigger canoe of the "Duke of York's Island," but says very little about the canoes.

According to Schellong (1904, p. 177) the canoes of the Duke of York Islands (Neu-Lauenburg) and of Blanche Bay, Gazelle Peninsula, are dugouts without washstrakes, to which are added prettily curved and decorated ends. The entire craft is whitened with lime and the end-pieces frequently have patterns painted in red and blue. There are three to six booms; the clamp connective consists of two, usually flat, vertical sticks inserted into the float. These clamps are tied to both branches of the forked boom; their upper ends are lashed together.

Von Luschan (1897, pl. 34) gives a good perspective drawing of a large outrigger canoe of the Gazelle Peninsula (fig. 81) with typical end-pieces and nine forked booms. It shows a seat or thwart in front of each boom except the first.

Each boom has a ventral groove at the ends, which fits over the gunwale of the hull. Over the hull there is a broad platform supported by the central booms. This is probably an innovation. There are two stringers over the booms, but the inner one does not extend to the two outer booms. Each fore and aft boom is attached to the float, which is as long as the hull, by means of a ⊥ connective (inverted T-shape) consisting of a branched bough, the ⊥-shaped lower end of which is lashed as usual to the float. The seven inner booms have the normal clamp connectives; the long, flat, pointed ends of these sticks are decorated with simple patterns and there is a tassel at their joined tips. The paddles have long pointed blades and simple round handles. Other photographs are given by Von Luschan (1897, pp. 41, 67, 68, 185). Excellent photographs of similar canoes of the Gazelle Peninsula are given by Meyer

and Parkinson (1894, pls. 11-13; pl. 12 is copied by Pflüger, 1904, pl. p. 224). A gunwale pole is shown to be tied over the booms.

Parkinson (1907, pp. 104-106) says that the small island of Uatom (Watom) has the monopoly on making canoes for the Gazelle Peninsula. The general name for canoes is *waga*.

The canoes are usually made of *iting* wood, which is very easy to work and is durable; small defects are remedied by bits called *tita*. The long spur of the end-pieces (*kalala*) is called *bakabakan* and the short one *bitonomarum*. The Duke of York Islands *mut* canoe has only the long spur. The beak of the *ponapong* canoe is short and recurved. The end-pieces are cut out of one piece of wood; the lower part is shaped to form a sharp angle, the sides of which are bound to the edges of the canoe at both ends. The angle is called *tabarum* and there dwells the spirit that protects the canoe.

The size of these canoes is extremely variable, ranging from small craft for one person to large ones for 12 or 16 persons. The crew sit one behind the other, as the canoe is seldom broad enough to take two men side by side. The outrigger is on the left side. The number of booms (*taraba*) ranges according to the size of the canoe from two to rarely six; they rest on the gunwales of the hull. The aft boom is called *teitei* because the steersman sits there (*tei*, to steer); no one sits on the fore boom (*taraba valval*). Parkinson (1907) describes the clamp attachment sticks (*li*) and says that the float (*aman*) is a piece of light wood pointed at each end about four fifths the length of the hull and rarely more than 20 cm thick. It is burnt to make it more durable. In the vessels that resort to Watom, the fore and aft booms are not fitted with *li*, but each has a small branch (*pererek*) which is not inserted into the float like the *li*. New canoes are often decorated with long strings of white down suspended from the hull to the outrigger; these are also added on ceremonial occasions. The canoes are carefully protected from the sun. Sails have been introduced by the white settlers. A state canoe (*waga na pedik*) was formerly used; it was of the same shape as the ordinary canoe but decorated more with painting and carving.

Brown (1910, p. 92) gives an excellent photograph of a "sacred canoe (*pidik*)," which he saw in Duke of York Islands in 1878. All of the seven booms appear to have the *li* connectives. Stephan (1907, fig. 17) illustrates a child's outrigger canoe with a lizard carved on the bow and stern, from Mioko, a southern islet of the Duke of York group.

A photograph given by Weule (1912, pl. 66, fig. 1) shows a fishing canoe of the Gazelle Peninsula which has no end-pieces. There are 10 forked booms of which the two outer ones have a branched bough as a ⊥ connective; the eight inner ones have the typical clamp connective. There is a stringer across all the booms just behind the fork and two others equally spaced between this and the hull, which extend over only the eight inner booms. The float is nearly as long as the hull.

Kleintitschen (1906, figs. pp. 57, 69, 83, 92, 93) gives rather poor illustrations of canoes of the Gazelle Peninsula. One at Talele Bay, on the north coast opposite Watom, is typical and has *kuku* end-pieces. Only the outer of the six booms appear to have forked ends. He gives an illustration of one end of a *tambatamba* with a very elaborate end-piece which is unlike any other known to me. Only an end boom is shown; its fork passes through a hole in a carved stanchion connective which is surmounted by a human head with a high headdress; its lower end is shown as being inserted into the float. He says that they do not construct canoes but buy them from Watom, and they make in these light outrigger canoes (*oanga*) long difficult coastal voyages of 150 km to the Nakanai. The *oanga* has a length of 1.5 meters for one person and 7 to 8 meters for 10 persons. They are paddled at the rate of 4 to 5 km per hour. Kleintitschen (1906, p. 333) gives the following myth of the origin of the *oanga*:

The culture heroes, To Kambinana and To Korvuvu, said they would each make an *oanga*. The former thought the one made by the latter was too short and clumsy so he took a stick and hit it, the noise resembled that of a drum and he exclaimed "that is no *oanga*, it is a *garamut*" [slit gong].

A "Gazelle Peninsula" canoe is figured, but not described by Powell (1883, p. 168) who was there in 1877. The drawing does not appear to be very accurate. The canoe has *kie* end-pieces. The four booms are not forked and each is attached to the float by a clamp connective. A stringer crosses the booms at the connectives, to which it is lashed, and close by there is a second stringer.

Pflüger (1904, p. 226) shows a small outrigger canoe on the beach at Matupi with no projecting end-pieces. A large platform appears to extend completely over the five booms. The attachment seems to consist of two pairs of undercrossed sticks. Doubtless this canoe was made by mission people. Similar canoes are figured by Meyer (1913, pl. 4, p. 104) and by Puxley (1925, pls. pp. 40, 88). This type is the same as the *oanga tamo* of Watom. The illustration of a canoe in the Kokopa district, Blanche Bay (fig. 82), does not need a detailed description.

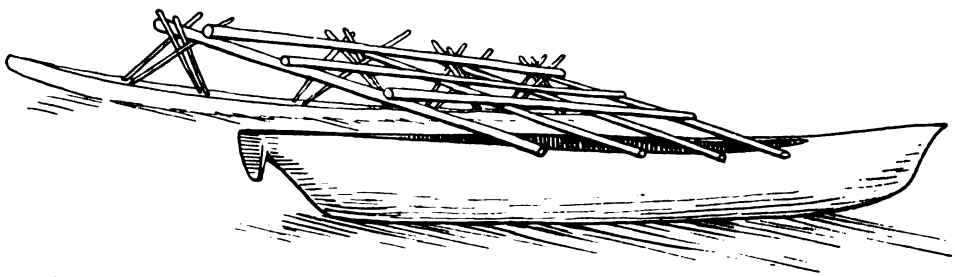

FIGURE 82.—Canoe (*oanga tamo*), Kokopa district, Blanche Bay, Gazelle Peninsula (after a photograph by R. H. Vigor).

Another photograph, loaned to me by Vigor, is of a canoe from the same district. The stern runs upward into a slender spur which has a slight notch on its under surface near the end. Fore and aft, but at some distance from the ends, two booms lie close together, lashed to the edges of the dugout. Each of these four booms rests in the angle of one pair of crossed attachment sticks. There is a central boom with the usual two pairs of undercrossed sticks. There are four stringers. The paired outer booms are peculiar features which probably have no special significance.

WATOM

Meyer (1911, pp. 257 ff.) describes the way in which canoes are made, the rites and magical songs then employed, the payment for making them, and other details. He says that the natives of Watom (Vuatom), a small island north of the Gazelle Peninsula, are, in general, excellent seamen. Their common craft is a small narrow outrigger canoe (*oanga* or *kuba*) which is not serviceable in a heavy sea.

The sides of the hull are 1 to 2 cm thick and when first cut out they tumble home, but crossed sticks are placed inside to straighten the sides and increase the cavity of the hull. The under sides of the seats are grooved to fit on the edge of the hull. The ends of the *oanga tuna* are furnished with fore and aft end-pieces (*komikom*), the forked base of which (*kakena*) is lashed to the edges of the hull (fig. 83, *a*). The fore end-piece rises vertically with a slight curve into a long thin erection which is recurved at the tip (*a lauko*); there is a sharp spur (*kupar*) at its base where the divarication begins. The aft end-piece (fig. 83, *j*) is similar but

slopes gently upward instead of being nearly vertical. In the canoes made at Nodup and Makadau the vertical extension of the fore end-piece (*mut*) is somewhat angular and the apex is cut square behind, or in the *tapuka* it is sharply bent back, almost at a right angle, and ends in a point. The spur is absent or very blunt in these types of end-piece and at this spot there is a lateral elliptical design (*kalangi*) (Meyer, 1911, figs. 7-10), analagous to the lozenge seen in fig. 80, *a*. The *komikom* serves as a protection against the waves, and the natives liken the traveling canoe to a swordfish leaping up. *Oanga* without the *komikom* are called *pcu* (invalids) because they let in the water and can make only short voyages.

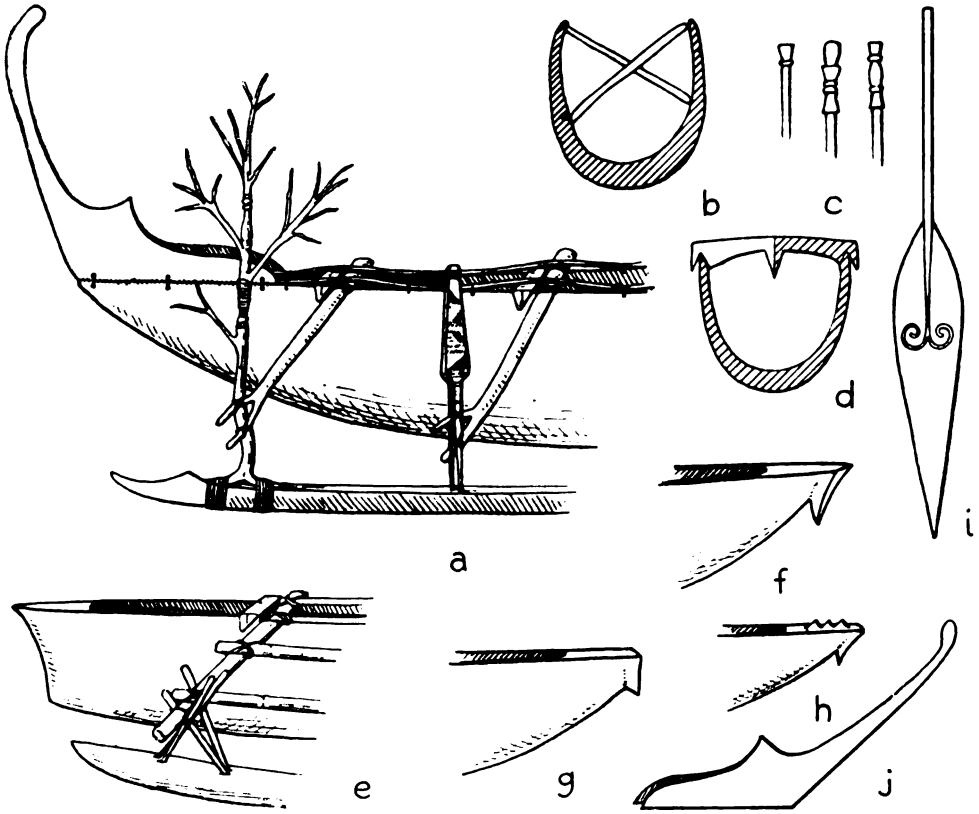

FIGURE 83.—Details of canoes, Watom: *a*, fore end of *oanga tuna*; *b*, section of hull with crossed struts; *c*, grips of paddles; *d*, section of hull with seat; *e*, bow end of *oanga tamo*; *f*, *g*, *h*, stern ends; *i*, paddle; *j*, stern (*komikom*) (after Meyer, 1911, figs. 12, 5, 19-21, 6, 17, 14, 15, 16, 18, 8).

The booms (*taraba*) are usually four or five in number, but are eight to ten in large canoes; they lie at a distance of about 80 cm from each other and are bound onto the edges of the hull and to the adjacent seats. The fore boom, which does not serve as a seat, is called *kaloata* (booby). The free ends of the booms are forked. The outrigger apparatus is placed on the left side of the hull, so that one can see clearly the direction of a canoe when it is traveling.

The float (*aman*) is made of light tough wood, moderately thin with a beaklike point at each end; it is about 1.8 to 2 meters distant from the hull. The attachment of the two outer booms consists of a branch with many twigs, the proximal end of which is ⊥-shaped and is lashed onto the float; the forks of the boom are tied to one side of the stem of the branch (fig. 83, *a*). For each attachment of the inner booms two spear-shaped sticks (*li*) of betel-palm wood are knocked into the float with a stone on each side of the fork of the boom to which they are lashed.

On each edge of the hull and over the seats and booms a strip of rattan (*pangul*) is bound, *di adua tan*, so called because the rattan resembles a *dua*, millepede (*Julus*).

The canoe is painted white with lime. The float is blackened by the fire from burning coconut-palm leaves, except for the ends which are protected by green banana leaves; the unburned tips are later colored red. Seats are painted red and white. Forked twigs (*pararak*) painted red, black, and blue may be fastened to the ends of the booms, and from the tip of the prow-piece a cord decorated with white fowl feathers may be stretched over the *pararak* and *li*. The bladelike ends of the *li* are painted with red, white, and black triangles, and the *kalangi* are painted red.

According to Meyer (1911, p. 264) a new form of the *oanga* was introduced by Samoans and is termed *oanga tamo* or *karaveta* (from "corvette"). The stern of the canoe shows a strong similarity to the Samoan *paopao* canoe (see Hornell, 1936, vol. 1, fig. 152).

The hull and float are generally heavier than in the native type; the hull has no end-pieces (*komikom*). The bow is more or less vertical, somewhat concave, and with a sharp point (fig. 83, *e*). The end of the stern bears a more or less deeply cut "nose". If the nose is cut deep it is called a parrot's beak (fig. 83, *f*), if less deep, the snout of a shark (fig. 83, *g*); if the fore head of the parrot beak is broad it is called a mask. There are often teeth on the upper surface of the end (fig. 83, *h*.) The booms (*taraba*) are fastened as in the *oanga*, but the attachment of each boom consists of two pairs of sticks (*li*) which cross underneath it and are inserted into the float. On each side of the edge of the hull a slat of betel wood (*aurarak*) is bound, similar to the rattan binding of the *oanga tuna*. Two stringers are fastened over the booms, the outer over the inner pair of attachment sticks. For long voyages the four or six central booms extend beyond the other side of the hull. In recent times the ends of the *karaveta* are decked to prevent water from coming in and to keep goods dry. A bamboo or board platform (*vatar*) in the middle of the canoe serves to hold baskets and other equipment. *Karaveta* are often coated with tar or whitened with lime.

In a paper on the fishery of the coast people of the northern shores of the Gazelle Peninsula and Watom, Meyer (1913, pl. 4) gives an illustration of a Gazelle Peninsula dugout with a "nose". There is no gunwale pole; a stringer is fastened over the four booms which have two pairs of undercrossed connectives. Various photographs of this type of canoe show three booms and a float about as long as the hull, raked and pointed in front and cut square aft. The attachment consists of two pairs of undercrossed sticks. The insertions into the float are sometimes so close together as to give the appearance of two V sticks that cross under the boom. Meyer (1911, p. 265) also describes the rig:

Each of the larger *karaveta* carries a sail (*a tel*). The mast, which consists of a stiff bamboo (*a kaur vat*) is in the middle of the canoe. The lower broad part of the trapezoid sail is fastened to a horizontal bamboo and the peak is stretched out by a thin bamboo. There is a triangular sail (*a sipsip*) between the mast and the bow. In sailing, the sail is set to the right over the outriggers; in putting about, the canoe is turned round so that the stern becomes the front end and the *sipsip* is shifted. In a strong wind one or two men sit on the float to prevent the canoe from capsizing. The paddles (*a vo*) have a lanceolate blade and the grip usually has a beaded carving (fig. 83, *c*, *i*).

Canoes with or without outriggers are used in connection with funeral festivals. The canoe of an important dead man is decorated with one or more elaborately carved and painted "Kanuschnäbel", *tabataba* (end-pieces?). These are made only by the Duke of York Islanders. Meyer (1911, pl. 12) gives a colored plate of nine of them. The "sacred ornament of the canoes" at Likiliki, figured by Duperrey (1826, Atlas, pl. 23, fig. 9), is a similar object. The toy canoes of this area do not resemble the large craft.

Rafts (*kan*) are made of six to eight bamboos tied together; sometimes five to ten large bamboos are strengthened by three or four transverse poles. Boys make rafts of four or five banana stems which are laid close together and skewered

with transverse sticks; short bamboo stems are pegged to the sides. In order not to sit too much in the water the boys shove a large piece of wood underneath and often make a covering of banana leaves. A float with a fire is called a "steamer"; one with a banana leaf as sail is a sailing ship. A number of long narrow bamboo rafts of the Gazelle Peninsula are figured by Parkinson (1907, p. 80, pl. 6); they carry large fish-traps.

LAUR DISTRICT

According to Friederici's linguistic map (1912) the northern boundary of the Laur district extends from Baleklek (Bakan subdistrict) on the east coast, just south of 30° 30′ S., and runs almost directly south to the west coast. Its southern boundary extends from Ulahabo on the east coast in a north to south line to a short distance south of 4° S. on the west coast. Between the southern and the northern boundaries of Friederici's southern district, including Muliama, is that author's Nokon district. From the present point of view it is convenient to ignore the Nokon district and to regard it, as does Rivers, as the southern part of Laur.

Rivers (1914, vol. 2, p. 500) points out that the western side of south New Ireland, Laur, the Duke of York Islands, and the eastern coast of the Gazelle Peninsula, have a dual organization and other related cultural traits. There are traditions of migrations from Laur and southwest New Ireland to the west; therefore Laur must be considered as part of the southwestern district of New Ireland.

The villages of Bo and Namatanai are on the east coast west of 152° 30′ E.; Nakudukudu is on that meridian on the west coast, and farther south on the west coast are Kalil and Palabong. The Lihir Islands belong to this area.

According to Friederici (1912, p. 287) *mon* are seen occasionally in this district as well as a thick, inelegant outrigger canoe of Samoan or Fijian type introduced by missionaries and teachers. The degenerate Polynesian canoe as described by Meyer has already been noted.

Most local canoes have end-pieces; the commonest is the reflected point (*kie*). Washstrakes may be either present or absent, and there are removable seats. The outrigger is always on the port side. There may be as many as nine booms; a stringer is fastened over the middle of the booms. The light float has a blunt aft end. The outer connectives usually have a ⊥ connective or ⊥ branch ("New Hanover style"), the rest are clamp connectives ("Lemusmus style"). The native vessels are rapidly deteriorating and their construction is declining.

Friederici saw rafts at several places on the east coast, on the islands of Mahur and Mali, and especially at Kalil. The usual type consists of six logs of wood lying close together and one on each of the long sides to form a kind of parapet. He gives a vocabulary (1912, p. 295).

Stephan and Graebner (1907, p. 162) say that in Kalil and its neighborhood the pure southern type of outrigger canoe is found (presumably with all the connectives of the clamp type). Klüpfel (1907, p. 73) states that the canoes he saw were old and poor and it appeared to him that the men were no longer accustomed to the sea.

LIHIR GROUP

Tasman in 1643 named the main island Gerrit de Nijs or Gardenijs (Gerrit Dennis is incorrect), but the native name is Lihir or Lir which is now its official name. To the north of Lihir are the small islands Mali (San Bruno), Massait or Masahet (San Joseph), and Maur (San Francisco).

Chinnery has given me a sketch of a canoe seen at Lihir (fig. 84). The canoe (*tagup*) is provided with a washstrake (*etangal*). The bow (*akana gadup*) and the stern (*amuli-il*) are upwardly prolonged by means of end-pieces and the narrow stem of each terminates in a flat vertical triangular expansion (*kuntagup*) which was said to represent a hawk's head. The free extremities of the four booms (*ai-ie*) are forked. In his sketches a vertical stick (*hidudu*) is shown to pass between the fork for each attachment. The two central sticks are simply inserted into the float (*sam*), whereas the two outer ones are ordinary ⊥ connectives. The paddle is called *owas*.

Friederici (1912, p. 288) gives these terms: boom, *ranran*; connectives, *ialat*; raft, *suak*.

Biro (1905, p 62) visited the "Gerrit Denys" Islands in 1900. He says that all the canoes (*dagub*) have the same form. The most noticeable local feature is the masklike carving at bow and stern (Biro, 1905, fig. 10).

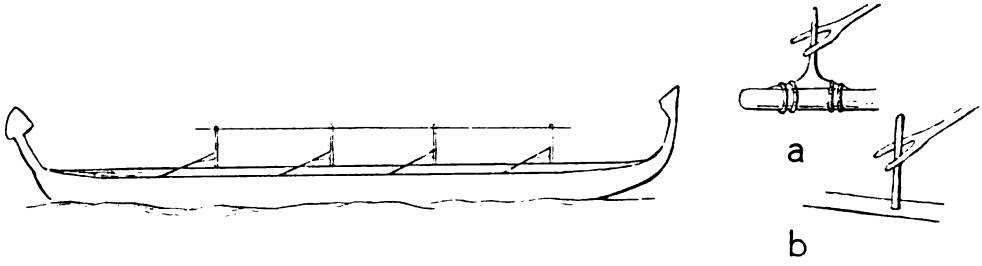

FIGURE 84.—Canoe (*tagup*), Lihir Islands: *a*, end connective; *b*, central connective (from sketches by E. W. P. Chinnery).

At Lihir the canoe is called *dagub* and the paddle *oasz*. On Massait and Maur the hulls (*a ssum*) are not made of such soft light wood as those of New Guinea. The float (*sam*) is of light wood and is attached on to the three to five booms (*a je*) [*aye*] "in the New Ireland fashion", by ⊥ connectives (*dudu*). The rib-frame (*mbek*) is formed by two thick elbow sticks, the inward projections of which are fastened in the middle with two split rattan strips (Biro, 1905, fig. 12); above each is a seat (*mundur*), the edges of which turn down over the gunwale, as in the Siara district craft. The paddles (*a wess*) are identical to those of Siara, but the bailer (*kambek*) is made of pandanus leaves laid together to resemble a purse, although bamboo is abundant on the island. The ends of the canoe are alike and decorated in the same way, though the details may vary. At Massait the fundamental type of the canoe ornament (*sosso*) appears to be a square board on which is carved in relief a cock's head (*te*); its eye is the operculum of a *Turbo* (1905, fig. 10); above is a triangular ornament (*pogotol*) (1905, fig. 13). On other canoes at Massait he saw a simple carving like a mushroom, also called *sosso*. On the bow of another canoe he saw simple designs (*sinsir*) carved in relief.

The narrowest part of New Ireland lies west of Laur about 3° 30′ S. Komalabu, Komalu, and Kokola are on the south side and Belik on the north.

Friederici (1912, p. 286) says that the numerous canoes of this area do not differ in any essential points from the Lemusmus type. They were up to 10 meters in length; one fine one seen at Kokola was 9.12 meters long, 0.39 meter broad, and 0.53 meter deep. One at Komalabu had six booms; the two outer connectives were ⊥-shaped and the four inner ones were of the clamp type. He gives notes on the decoration of the canoes, which was in the Lemusmus style. Throughout the whole district the float was on the port side. He saw many canoes in process of manufacture, but he never saw a sail. He saw a bamboo raft (*aro*) at Belik. He gives the following terms:

	Komalabu	Komalu	Kokola	Belik
Canoe	sim	sim	sim	sim
Float	saman	saman	saman	saman
Boom	a-mburu	a-mburu	buru	a-uvat
⊥ connective	ruat	chatuat	chatuat	ruru
Clamp connective	burisinis	brusinit	burisinit	.....
Seat	a-mbola	bola	bola	buru
Paddle	oso	oso	oso	a-oso
Pandanus bailer	voktaban	aubo	gataban	ataban

Central New Ireland

Central New Ireland comprises the Schleinitz Mountains linguistic area. Lamuson (Lamussong) on the north coast is close to the Hamba boundary, and Panakondo (Panukuda) is farther east. On the south coast from west to east are Lambu (Lembau), Katendan, Logun, Mesi, and Lamban.

The type of canoe is essentially that of Lemusmus, usually with washstrakes; the float is pointed in front and blunt behind. The canoe is always without mast or sail. The pointed bow is easily distinguished from the blunter stern. The number of booms varies: the craft that Friederici (1912, p. 282) saw in the Lamussong-Panakondo district had, as a rule, only two; of 29 Mesi canoes, 28 had four and 1 had six booms, all on the port side. Formerly the northern canoes were carefully maintained and were efficient craft, and the washstrakes consisted of several boards and a gunwale lath. All canoes are sewn with lianas and rattan and the seams are calked thickly with *Parinarium*. They are more fragile than the canoes of New Hanover and give an impression of unseaworthiness. In each Panakondo canoe are five straight seats for the paddlers and a curved one for the man with the steering paddle. The booms lie on the washstrakes. There is a bamboo bailer (*masepa*) at Panakondo, and bailers made of pandanus leaf fastened by two thorns are found in Lamussong, Lambu, Mesi, and Lamban. Friederici gives the following vocabulary:

	Panakondo	Lamussong	Lambu	Katendan	Logun	Mesi	Lamban
Canoe	sim	sim	sim	sim	sim	sim	sim
Float	saman	wesem	saman	suman	saman	saman	saman
Boom	wenawat	onesim	mburu	lelelebe	lamla	lamtu	lamtu
⊥ connective	wawas	wawas	rambutas	ranambutas	achatuat	antuwat	antuwat
Clamp connective	wawas	wawas	meremetlu	mbasinis	mbubusinis	mbubusinit	numbusinit
Seat	mbru	.....	onbula	chonbola	chonbola	chonbola	onbolo
Paddle	oso	goso	.....	....	....	nakan	.....
Bailer	masepa	gabinba	rapsevu	.....	....	varasava	vosava

In the neighborhood of Lamussong, Panakondo, Katendan, and Lambusso, a raft (*rama*) takes the place of the fast-disappearing outrigger canoe. Friederici did not see an outrigger canoe in Katendan or Lambusso. In Panakondo there were five, and only one was seen in Lamussong. He feared that in three years (dating from 1908) the last canoe of the district would be rotten and broken up. In the Panakondo-Lambusso district the raft consists of five arm-thick logs of wood instead of bamboo, the middle one of which is the longest; four others decrease like organ pipes; they are pointed fore and aft and bound together with rattan bands.

Nayama district

Nayama district extends about 25 kilometers east of about 3° S. and stretches nearly to the north side of the island. The people of this region of New Ireland

speak Papuan languages interspersed with Melanesian words, but there is a later immigrant element. The frequent occurrence of a non-Malayo-Polynesian word for canoe is to be explained by the supposition that the earlier inhabitants of New Ireland were already in possession of a dugout to which the incoming Malayo-Polynesians added the float and at the same time its name.

According to Friederici (1912, p. 280) the outrigger canoes do not differ from those of the previous area. His terms are: canoe, *obinem*; float, *yamene*; boom, *bururume*; clamp connectives of New Ireland type (two inner of four) *kodirap*; ⊥ connectives of New Hanover type (two outer of four), *beruwa;* seat, *malus:* paddle, *leibam*; pandanus leaf bailer, *ararum*.

HAMBA DISTRICT

Along a short stretch of coast north of Nayama district there is a rapid retrogression in canoe travel. This area, which is called Hamba, includes the villages of Liba, Lassu, Langanie, and others.

The following terms are given by Friederici: canoe, *tibe*; float, *sem*; boom, *hie*; connectives, *tsitsucho*; seat, *butel*; paddle, *hes*. The *yai* of Fatmilak and *hie* of Liba may be equated with *iato*. The terms for connectives and seat are related to those of the Tabar Islands.

TABAR ISLANDS

The Tabar group consists of three large islands, from north to south: Simberi, Tatau, and Tabar. The name "Gardner Islands" is incorrect.

Friederici (1912, p. 284) saw four kinds of canoe on Simberi. Elsewhere one type at least had disappeared, due to the influence of New Hanover and north New Ireland in the northern island. At Simberi on the west point of the island of the same name he saw three types close together:

> Type 1 is obviously a blending of the New Hanover canoe with that of Lemusmus, New Ireland. The aft portion of the float, the booms, the clamp connectives, and the seat are in the Lemusmus style. The hull, the strong end-borders ("Stevenleisten"), the animal's [fowl's] head, and the end of the projecting bow and stern are quite in the New Hanover style. In many canoes the outrigger apparatus alone distinguishes them from those of New Hanover. A few small canoes, which were in other respects of the Lemusmus type, had pointed beaks showing New Hanover influence.
>
> Type 2 is a large dugout without strakes. These have only two booms which are placed between the gunwale and a gunwale lath. The canoe is on the whole in Lemusmus style.
>
> Type 3 is a beautiful canoe in the style of that of Panakondo. It has washstrakes, beautiful carved ends, broad pitched seams, plaited side laths, and ornamental tassels fore and aft. [This type is evidently analogous with that of Lawuan.]
>
> Type 4 is a crude dugout without outrigger. He saw one at Talemuk on Simberi and two at Mopue, an islet east of Tatau. These craft were confined to the eastern side of the group, a fact worth noting in view of the dugout that is found in Anir.

Friederici says that he saw only at the west end of Simberi a type strongly influenced by New Hanover. On the other coasts of the group, types 2 and 3 were found together. The simple Lemusmus form appeared to predominate in the north, and boats with washstrakes in the south. Fewer vessels were found on the eastern side of the group than on the western. There are in this small group of islands more canoes than on the opposite coast of New Ireland, but not so many as in the New Hanover-Lemusmus area. Very few canoes were seen under construction. The people speak a decomposed dialect of a Melanesian language.

Of the few rafts observed, one at Kowamerara on Tabar (Friederici, 1912, fig. 91) had a stand for spears, paddles, and poles. Another at Topimeda in Tatau consisted of seven close-lying bamboos bound with rattan. A bamboo raft was seen at Sumbuari, Tatau. Rafts off Tabar Island were photographed by Chinnery; they consist of three or five long bamboo poles, of which the central is the longest, strengthened by three or four crossbars.

	SIMBERI			TATAU			TABAR		
	SIMBERI	BONDAR	KATATAR	NORTH TATAU	TOPIMEDA	SAMBUARI	MOPUE	KOWAMERARA	KOKO
Canoe	sum	sonbi	sum	sum / tsim	sum / bakok	sum	sonbi	sonbi	tsombi
Float	sam	sam	sam	sam	vovoru	vavaru	samane	sama	same
Boom	ai	avarat	.....	ai / manem sum	ndin	dindi	avarat	avarat	avarat
Attachments	tsitsigo	tsitsigo	.....	tsitsigo	mbou	tono	tsitsigo	tsitsigo	tsitsigo
Seat	mbutil	.....	.....	mbutil	buduri	.....	buturi	buturi	.....
Bow head	mua	moa	.....	mo	mo	.....	mua	mue	mua
Paddle	vurus	vos	.....	vos	vos	vos	vose	vos	vorusa
Coconut bailer	kui	.....	.....	.....	.....	da	.....	sabu	.....

In this short list by Friederici (1912, pp. 285, 286), as in the whole language of these light-colored Tabar Islanders, the Malayo-Polynesian element is strongly represented.

Parkinson (1907, p. 261) states that Tabar and Lihir have colonies on the neighboring coasts of New Ireland between whom for twenty years there have been friendly relations. In these two islands and on the corresponding mainland the flesh of the turtle is forbidden to chiefs as it is in Polynesia.

Concerning the canoes, Parkinson (1907, p. 297) says that the dugouts of the "Gardner" (Tabar) Islands have washstrakes, their ends are very different from those of north New Ireland canoes as they are carved and painted. The carvings represent protecting spirits that guard men from evil sea-spirits, that is, against sharks; in Tasman's journal, a fanciful drawing is given of such carvings. This is reproduced by Parkinson on page 829.

PANEMEGO-FESOA AREA

The Panemego-Fesoa area extends from about 3° 3′ S. to the boundary of the Nyama district. Panemego is a village to the west and Memesalang one to the east of the middle of the south coast. On the north coast Lakuruman is near to the west boundary. Fesoa (Fetsoa) is about the middle, and Fatmilak and Bol are close to the east boundary. The southern type of canoe persists. In only a few places are there slight changes. For example, at Panemego there are small removable seats which serve to thrust out the sides of the hull.

Friederici (1912, p. 280) illustrates the bow of a Fatmilak canoe which is blunt-ended, above and in front of which there is an elongated shelf which bends slightly downward. Friederici gives the following terms:

	Panemego	Nemasalang	Lakurumau	Fatmilak and Bol
Canoe	bil	mus	mus	chaleu(?)
Float	saman	zemen	siman	zemen
Boom	inau	regelare	auvai	yai
Connectives	fas	fas	fas	fas
Paddle	vos	vos	vos	vos

Chinnery has given me some notes on the canoes (*embun*) that he saw at Tauunkaulin village which is between Fesoa and Fatmilak. They are simple, sharply pointed dugouts [apparently without washstrakes or end-pieces], and there is no platform. The hull is called *ejim*. There are four forked booms (*embul*); the two outer ones are connected with the float (*evasam*) by ⊥ connectives (*gantuak*), and the inner booms by clamp connectives (*wopmeri-metlup*) and for these there is a lashing extending from the boom near its fork to the float. The seats are called *ewugukes*, the paddles *ogo-ozha*, the bow *eminua*, and the stern *awopmozhim*.

LEMUSMUS DISTRICT

The Lemusmus area extends from a line that passes west of Lakurumau on the north coast and west of Urol on the south coast, at about 2° 53′ S. to one about 10 miles to the west that passes east of Mangai on the north coast and east of Gia on the south coast, or about 10 kilometers east of 151° E. Lemusmus is about the middle of the south coast and Latanghei just west of the eastern boundary. Lawuan is on the north coast, a short distance from the western boundary. The area includes the greater part of the island of Dyaul.

The local canoe (*ime, bil*) of Lemusmus (fig. 85) is a dugout without a washstrake or end-pieces, and in all its parts is thinner and weaker than the northern type. Friederici (1912, p. 278) describes a horizontal fissure calked with *Parinarium* that extends along the sides for a short distance from about the center of the bow and stern. He was informed that this characteristic of Lemusmus canoes was due to the defective condition of the wood employed. The four forked booms (*butul*) are tied to the gunwale and are connected, in the southern style, with the float (*saman*) by two flat sticks (*haeya*). The paddle is called *os*. Biro (1905, fig. 11) figures a ⊥ connective (*jejc*) from Dyaul Island.

At Matayang on Doi Island, which is close to the mainland, Friederici saw one canoe analogous to the two old dugouts at Ungalik in New Hanover; he could not discover its origin. The hull was clumsy and the broad gunwale extended aft as a wide flat shelf. The outrigger was of the southern type.

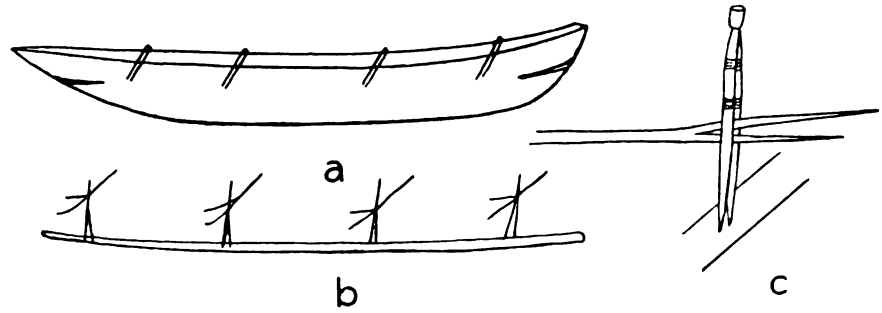

FIGURE 85.—Canoe (*bil*), Lemusmus: *a*, hull; *b*, float with connectives and forked booms; *c*, clamp connective (after Friederici, 1912, fig. 87).

The southern and northern types of vessel are found side by side at Lemusmus and other places throughout the district, in a proportion of 3 to 2 respectively. Some of the canoes have the attachments of the two outer booms of the southern [clamp] type and a ⊥ connective of the northern type for the two inner booms, a reversal of the usual arrangement. The northern type of canoe completely disappears east of Lemusmus, and it is much the same on the north side of Dyaul.

A photograph, given by Meyer and Parkinson (1900, pl. 30), shows four canoes on the beach at Lauan (Lawuan) (fig. 86). They are narrow, well-made canoes of elegant form.

There are one or two washstrakes on each side, the seams of which are neatly calked. The topstrake is narrower than the lower and is so cut that a square bead projects outboard along its outer upper edge. The ends of the dugout slope up in a gentle curve and they appear to be notched to receive a bow- and stern-piece which continues the upward curve, in which the strakes are also implicated. There is a complicated carved ornament at the summit of the end-pieces, which Stephan and Graebner (1907, p. 162) say can not be brought into genetic relation with the end-pieces of the south. A ledge runs backward from each end, following the curve of the washstrake; it is pierced with several holes from which leaf streamers depend. One or more seats pass across over the gunwales and are held in position by a downwardly projecting bead, as in figure 79, *h*. There is a single outrigger with two booms which are far apart and pass through the washstrakes but do not project through on the other side. The free end of each boom is forked and is lashed to a long ⊥-shaped bough connective, the end of which bears two or three small branches. The central portion of the bough may be decorated with streamers, and its lower horizontal end is secured by two lashings to the cylindrical float, which has about the same length as the hull. None of these canoes has a platform or mast.

North New Ireland

North New Ireland is the Nusa-speaking district which extends west from about 10 kilometers east of 151° E. to Lavongai (New Hanover) and the intermediate islets. The people on the mainland, on most of the islands of the straits, on the western end of Dyaul, and on the adjacent islet of Mait, speak the Kawieng dialect, while those of Lavongai have another dialect of the Nusa language. Par-

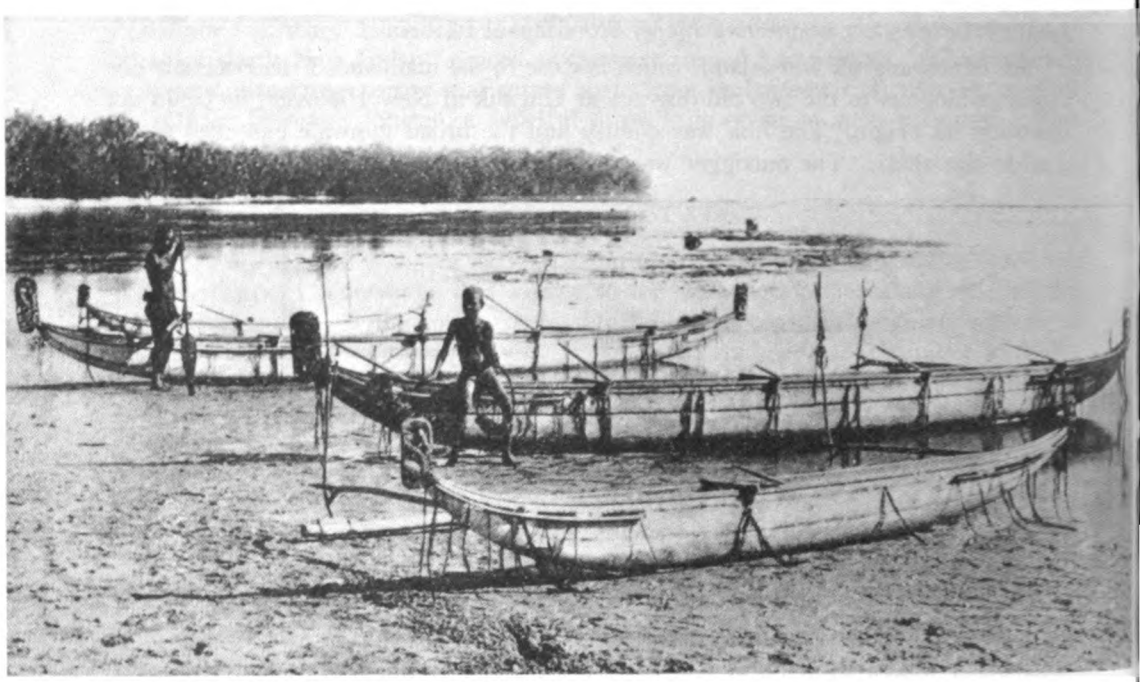

Figure 86.—Canoes on the beach, Lawuan, Lemusmus district (from Meyer and Parkinson, 1909, vol. 2, pl. 30).

kinson (1907, p. 259) refers to the cultural difference between these people and those of the south. He says they are dark brown or black-brown in color, very like the Buka, a Bougainville folk, but individuals no darker than Samoans or Tongans are to be seen. They all have frizzly hair.

Strauch (1877, p. 87) says that the canoes of north New Ireland are at first sight distinct from those of Lavongai; they are not so long and have straight, not incurved, sides; the seats consist of the booms or of special thwarts. He saw war canoes like those of Lavongai. In Gazelle Channel, between the mainland and Dyaul (Sandwich Island) he noticed a slight difference from the Lavongai canoes in the construction of the bow carving. The canoes were more strongly built and were decorated along their sides. There were two booms instead of four.

Finsch (1888-E.E., p. 139; 1914, p. 480) says that at the extreme northwest end of New Ireland and on New Hanover there is a special type of outrigger canoe (*tambul*) which is a long, narrow, smooth dugout with a straight upper border and slender ends; most of them have a fretwork carving at stem and stern. There are two racks on the outrigger apparatus to hold spears for the frequent war expeditions. One canoe, now in the Berlin Museum, is 7.30 meters long and can carry

four men. Some canoes of the district hold only one man; large boats (*kati*) 50 feet or more in length carry 16 to 18 men. The natives could propel these elegant craft very rapidly with paddles, but have lately introduced a mast and canvas sail.

The canoes of the north and farther east along the north coast of New Ireland have been described by Schellong (1904, p. 178):

> The dugouts are neatly fashioned and are so narrow that the occupants can only get one knee into the cavity, while the other leg is stretched along the edge; even bailing is difficult. There is no washstrake. The hull and its appurtenances have a coating of lime. There are fine carvings at the bow, the favorite motive being a combination of a human face with that of a fish and with eyes of *Turbo* opercula. A noticeable feature is the small number of simple straight booms; a very long canoe has only two. The attachment consists of a ⊥ connective which is lashed to the float and boom. Two cane rods are inserted into the base of the connective and cross over the end of the boom to which they are lashed; there are tassels at their free ends [fig. 87, *a*]. The same cane [rattan?] strip that is used to lash the boom to the

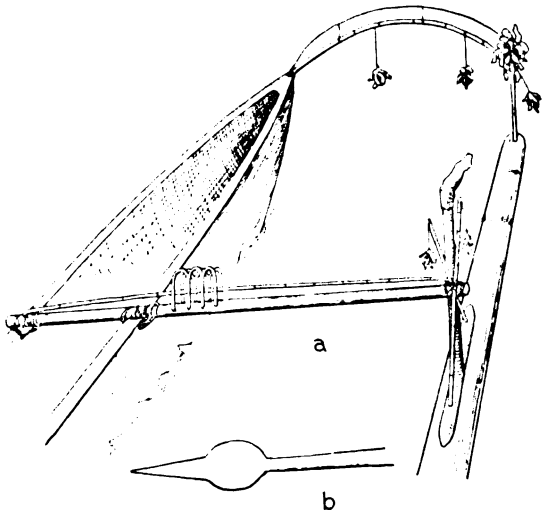

FIGURE 87.—Canoe of the north coast, New Ireland: *a*, aft boom and attachment, stern bowlike attachment; *b*, blade of paddle (after Schellong, 1904, p. 179).

> off gunwale is carried along over the top of the boom to be fastened to the connective. A pair of three vertical cane loops is lashed to the boom, to serve as a rack for holding spears. A characteristic of some north New Ireland canoes is an elastic bow ornamented with tassels which attaches the stern of the canoe to the aft end of the float; over it is a thinner secondary bow. Schellong thinks it is not purely ornamental, but that it serves as a spring device for keeping the hull and outrigger at a uniform poise, as there are only two booms.

At Lassuk village Schellong saw simple rafts composed of three trunks lashed together or of a thick plank with a light plank lashed to each side to form a rim 3 to 4 inches high.

The description given by Parkinson (1907, p. 296) does not add to the foregoing information. He says there are two or three booms and that sailing has now developed into a regular sport.

A photograph by Meyer and Parkinson (1900, pl. 34) of canoes at Nowan, opposite Nusa Island at the extreme north point of New Ireland, shows several elegant, long, narrow dugouts:

> At what is presumably the bow, the hull has a small perforated carving, sometimes a bird's head. There is no washstrake. The short booms are two or three in number and each has a spear rack composed of a single piece of cane or rattan, which is doubled up under the

boom so as to form two or perhaps three vertical loops and one free end on each side of the boom. Each boom has a ⊥ connective; it seeems that the fore connective has a carving or other ornamentation at its end, whereas the aft one is quite plain. A thin crooked stick appears to pass through the connective and is lashed to the boom which rests on it. Strings pass from the connective to the boom. This method of attachment is practically identical with that described by Biro for New Hanover. One canoe shows obscurely the elastic aft bow described by Schellong (1904).

At Kapsu, on the north coast a few miles from the eastern boundary of the Nusa district, Romilly (1887, pp. 51, 52) saw canoes which were masterpieces of native construction. The thwarts and paddles were elaborately carved. The thwarts of each canoe were wide enough for two paddlers; there was room between the thwarts for a man to sit in the bottom. Such an arrangement with additional men sitting aft to steer and two to three others forward to blow horns would make the crew of each canoe about 40 men. Romilly does not mention an outrigger and it is evident from the broad beam that these canoes could not have been dugouts but must have been built-up boats and doubtless had the same construction as the *mon* of south New Ireland.

A photograph by De Rautenfeld taken at Kavieng, an islet near Nusa at the north end of New Ireland, shows a very narrow canoe; the opening at each end as far as the boom is decked by a narrow slat of wood; there is no swollen rim on the edges of the hull between the booms. The two booms are far apart. The long, slender float is connected with each boom by a ⊥ stanchion. The boom rests on a curved stick which presumably is lashed to the stanchion and several cords running from the upper end of the stanchion are tied to the boom. There are no rattan loops on the booms. The sail is of European rig. A man is sitting on the center of the canoe with his shins one in front of the other in the hull. The connectives are of the Lavongai type.

Parkinson (1907) gives a photograph from a drawing in Tasman's journal (written in 1643; Tasman, 1898, p. 103). The canoe holds three paddlers, one of whom is blowing a triton shell:

> The ends of the canoe are practically vertical. One seat is shown inboard and there are two additional flat boards athwart the gunwales and extending a long way beyond them; they are constricted in the middle, where there is a small quadrangular thickening. These winglike structures are apparently a misapprehension of the seats of the canoes of Lawuan. The drawing shows that in 1643 the canoes of north New Ireland had two booms (represented as without a fork) with a branch connective, which is shown as inserted into the float, but doubtless it was a ⊥ connective. The float is short, pointed, and raked at each end. Large, elaborate and fantastic carvings are fastened to the bow and to the stern, which are dissimilar; they may be compared with Biro's photograph (1905, fig. 10) of an analogous canoe at San Joseph (Massait), Lihir Islands.

Although Tasman's drawing is doubtless inaccurate as to details, it evidently represents the same type of canoe as one at Lawuan (fig. 86). The paddles have simple shafts and grips and finely pointed, lanceolate blades on which is carved a realistic snake. Forrest's illustration (1779, pl. 16) was copied from Valentijn (1724, p. 56, pl. 22, x) which, in turn, was based on Tasman's drawing, but it is so greatly modified as to be unreliable.

LAVONGAI (NEW HANOVER)

The best account of the canoes (*bul*) of New Hanover (fig. 88) is that by Biro (1905, pp. 66 ff.), who describes those seen by him in 1900 at Mateisom on the south coast of the west end:

They did not differ from the general type of the region, but they were carefully made and had beautiful bast knots on them. The dugout (*kaleu*) was carefully smoothed inside and out. Both ends of the hull had small well-done carvings (Biro, 1905, figs. 18, 19). The motive could usually be recognized as a cock's head though each figure differed from the other. The edges of the hull are cut so as to form a swollen rim in raised carving for a short distance from the ends, a characteristic never lacking [fig. 88]. There is no other ornamentation on the hull. The three simple booms (*inau*) are attached to the float (*saman*) by means of ⊥ connectives, one for each boom. A connective (*karass*) is the straight bough of a tree with a part of the trunk which forms a foot on both sides and is lashed to the float with strong bast; its upper end is covered with fine rattan plaitwork. The boom is fastened to the lower third of the connective by rattan lashing, and is connected with the lower border of the plaitwork of the *karass* by means of two strings (*taun*). The end of the boom is also supported on a curved bough, the thicker end (*a gombu*) of which is often roughly carved to represent a bird's head; the thinner end (*tupok*) passes through a hole in the *karass*. From the bird's neck hang strips of leaves (*malgas*) tied on with string to indicate the wind. On each boom is fastened a basketlike structure (*manmangi*) of rattan loops, within reach of the outstretched arm of a man sitting on a seat. It is used for holding spears, the thicker ends of which rest in the basket and the thinner ends on the *a gombu*. The rattan lashings of the different parts are extremely neat; that which fastens the booms to the borders of the hull is called *nak putuk*. The paddle is of the some type as that in New Ireland. A pandanus-leaf bailer (*kambek*) is used.

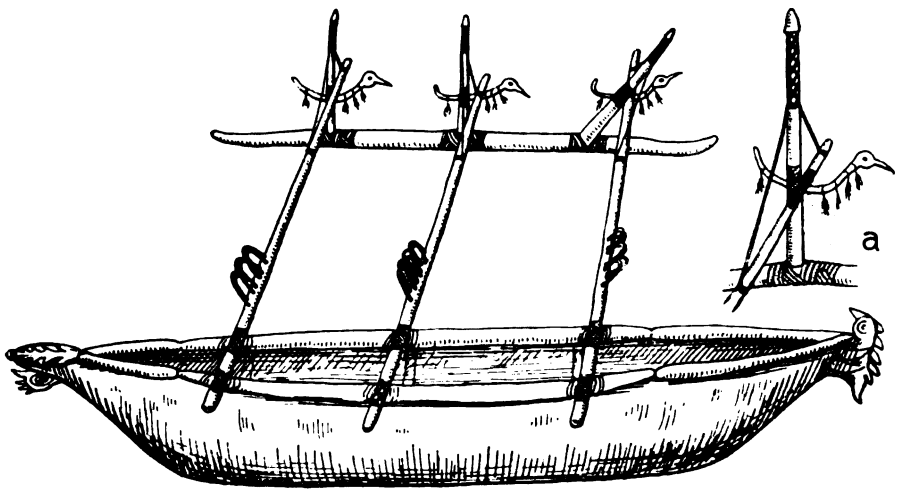

FIGURE 88.—Canoe (*bul*) of Mateisom, Lavongai: *a*, detail of attachment (after Biro, 1905, figs. 18, 20).

Where thick bamboo is abundant, bamboo rafts are used for short expeditions on calm seas and for crossing rivers; they are paddled or poled.

Strauch (1877, p. 83) refers to war canoes which he says are apparently similar to, but not so durable as, the ordinary ones of MacCluer Gulf (New Guinea). They are made of planks of hard and lasting wood built over a dugout. The planks are mainly held fast by the thwarts which project downward over the upper border of the planking. He says that the sides of the ordinary canoes tumble home. There are no accessories on the booms and no high peaks at the ends of the hull, but there are carved ornaments, which are not willingly parted with. According to Friederici, some of Strauch's statements are inaccurate.

Friederici (1912, p. 274, pl. 3, fig. 26) gives few details; he says the bow and stern can always be discriminated by a trained eye.

Like the canoes of Matauta and Matatui on the extreme west of New Hanover the craft on Ungalik, a small island close to the north coast, have the end points of the canoe scarcely raised above the height of the middle part of the edge of the hull. Out of 37 canoes at Ungalik, only 11 had a carved ornamental addition (*toitoi*) to the fore connective. A pointed bird's (cock's) head on the bow is very common. Of these 37 canoes, 13 had the outrigger on the port side and 10 on the starboard; 28 had two booms each, the remaining 9 had three; 23 had sails and 1 had two masts, but these are recent acquisitions. The largest canoe was 12.3 meters long, 0.52 meter broad, and 0.7 meter deep. The usual length seems to be about 8 or 9 meters.

Friederici (1912, p. 276) gives a full description of the method of paddling. He saw at Ungalik two old canoes belonging to very old people. The hulls were very different from those of all the other canoes (fig. 89). They were stout, heavy dugouts, with outriggers as in the other canoes. He could not get any information about them.

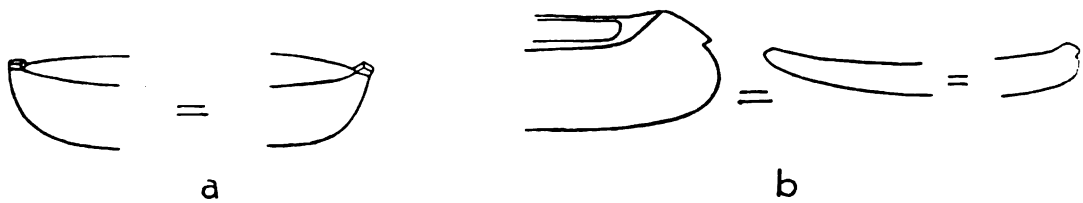

FIGURE 89.—Bow and stern of two old canoes, Ungalik, Lavongai: *a*, belonging to an aged woman; *b*, belonging to an aged man (after Friederici, 1912, figs. 82, 83).

SUMMARY

The connectives of the outrigger in the New Ireland area are distinctive. In the extreme south apparently only forked booms with clamp connectives are used. There are some examples of the same arrangement in the Blanche Bay area, New Britain, and in the Laur and Lemusmus districts. Friederici goes so far as to call this the "Lemusmus style." But in all these districts, except the extreme south, the combined ⊥ and clamp connectives are usually frequent and this combination holds good for central New Ireland. In north New Ireland, including Lavongai (New Hanover), and in the Emira (Squally Islands) and Mussau (Saint Matthias) groups to the north, the booms are not forked and there is a ⊥ connective. In the Gazelle Peninsula area the ⊥ connective is typically a branch with twigs rather than a simple stick; the same is true in a simpler form at Lawuan on the north coast of the Lemusmus district. It is thus clear that the ⊥ connective is for this general area a northern form and the clamp connective a southern form, but except at the extreme ends a combination of the two is generally found. It seems probable that the clamp connective is a modification of an attachment by means of two parallel vertical sticks such as occurs sporadically in Melanesia. I do not recall the occurrence of the ⊥ connective elsewhere, though something like it is found in Indonesia (Haddon, 1920-a, pp. 92 ff.).

In Blanche Bay and Watom, which, though they are in New Britain, are here considered as part of the southwest district of New Ireland, small canoes with undercrossed stick attachments have recently made their appearance. In the Tanga group there are simple stick attachments that recall types found in the marginal islands of Melanesia.

End-pieces with a spurlike end directed upward characterize the canoes of the southwest area only. This area, especially the southern part, is also characterized by the occurrence of the plank boat (*mon*) without an outrigger.

EMIRA GROUP (SQUALLY ISLANDS)

A good illustrated account of the manufacture and structure of the canoes (*olima*) of the "E Mira" Islands is given by Chinnery (1927, no. 2, pp. 174-183). This group consists of one large island, Emira (Emirau, Kerué, Squally Island, Storm Island, or Hunter Island), and three adjacent islets. Emira lies north of Lavongai in 150° E. and 1° 38′ S. Chinnery has no doubt that the culture of the islands has arisen out of the interaction of Micronesian, Polynesian, and Melanesian influences.

If a man wishes to make a canoe out of a tree that belongs to another man he usually promises to pay for it with fish. A tree is not cut down until food and pigs have been saved for the feasts in connection with the various processes of manufacture. Before any work is begun a friend of the canoe builder, usually his *aloa*[3], is selected to perform certain magical functions to insure the safe construction of the canoe. This man must not eat any food near the scene of the operations. When the canoe is finished the *aloa* paints it with black and white bands and smears the hull with a magical mixture. He "does not afterwards travel in this canoe, nor does he put in it any fish caught by him, 'lest the canoe break'." The construction of the canoe is performed by several skilled men who formerly used axes and adzes with *Tridacna* or *Terebra* shell blades. Two craftsmen are selected to carve the ornamental attachment sticks. The finishing off of the interior of the hull is a delicate business and is entrusted to the experts who carve the bow and stern. The workers sleep on the spot while the canoe is being made, and contact with women is strictly avoided. All the workers are paid with strings of fish.

Today there are no large ceremonial canoes (*manga*) such as were apparently possessed by the chiefs (*vaun*). The type of vessel in use at present is evidently much smaller than the canoe of the old days and its extremities and attachments are not so elaborately carved:

> The canoes seen by Chinnery were from 10 to 20 feet long and the depth of the hull did not exceed 18 inches. The hull tumbles home so that the opening is very narrow. There is a well-marked rake fore and aft, and the upper surface is horizontal throughout its length. The bow and stern are usually carved and painted with black (*anale*) and white (*mama*) bands running obliquely around the hull. The white color is made by bruising the *mama* seaweed and rubbing it on the hull. The design of the bow and stern carvings varies a good deal. The extremity of the bow of one (fig. 91, *a*) is rounded and below it is a tiny beaklike knob (*urugila*) which represents a bird noted for its strength of flight: "It drinks the water and then flies strong and fast, as will the canoe." Behind the *urugila* is an opening with a tonguelike projection called *pakoto* (the mouth of a bird). The projection (*ramuramutipau-ua*) represents the tongue of a crocodile. Leaves of *sausau* are tied below the *pakoto* in such a way that they sway in the wind, "to give buoyancy so that the bow will ride above the waves", and also pieces of broken fishline or netting (*ailoto*) which sway in the wind and sing to attract the fish. Behind this is a small groove (*ai-auna*) into which a pole is fitted when lifting the canoe into the water. Farther back on the median ventral line is a keel-like projection (*wasatutu-enila*) to which are tied several small knots of fiber (*auki*). The bow is known as *mua* and its painted portion, *aratua*. The stern (*mulia*) is similar to the bow.

Chinnery gives a photograph (fig. 90) of a canoe in which the bow end has a decided rake, though the upper surface is horizontal. At the tip is a depending triangle and from its somewhat square end a distinct ridge runs backward along the sides of the bows. This recalls the ledge of the Lawuan canoe (fig. 86).

[3] The *aloa* seems in this instance to be the man's mother's brother, or perhaps failing him, a male of the generation and clan of his mother; but the term also applies to his sister's son or certain corresponding children of the clan. Inheritance and succession among these people are matrilineal.

In most canoes three, but in some only two, outrigger booms (*iaro*) are lashed to the gunwale by means of cords that pass through holes in the hull, and also to a short stout stick (*aisosoatau*) which stretches between the sides of the hull immediately below each boom (fig. 91, *c*). The float (*samana*) is considerably shorter than the hull; it is pointed and sheered at each end, and is flat above. Each boom is attached to the float by a stanchion (*karunga* or *papasa*) beyond which it extends for some distance (fig. 90).

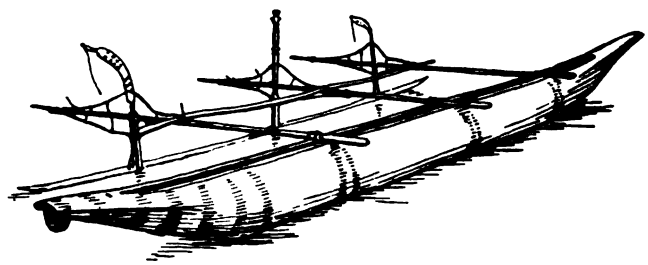

FIGURE 90.—Canoe (*olima*) of Emira Islands (after Chinnery, 1927, vol. 2, pl. 28).

In canoes with three booms, the upper half of a fore and of an aft *karunga* (fig. 91, *d, e, f*) is bent at an oblique angle to the stem and forms a flattened board in which two series of vertical slits (*tuiririri*) are cut "to allow the wind to come through", and thus increase the speed of the canoe. In the center, between the two series of slits is an incised cross (*oio*), said to represent a starfish, and on each side of the *oio* is a concentric circle design (*teka mukati*) which represents the intestines of a fish. Leaves of the *sausau* are tied to the upper edge of the *karunga*; because these light leaves are carried into the air by the breeze, they give lightness and buoyancy to the canoe. The booms are fastened more securely to the *karunga* by means of a rope (*aigagaum*) which passes through a hole in the lower part of the broad portion of the *karunga;* one end is lashed to the end of the boom and the other to an equal distance along its length. The rope is served with thin strings of coconut fiber, and it is also tied to the boom in several places with vertical lashings of coconut fiber (*talinga-valau*). Along the whole length of the *aigagaum* are tied short pieces of fiber (*auki*) which trail in the wind and "sing to attract the fish", and also swaying from it are a number of light *oni* leaves, to give buoyancy to the canoe. The aft *karunga* is usually carved differently; in one seen by Chinnery (fig. 91, *d*) it is surmounted by a small carving of a fish (*pakiau*) said to represent the flying fish which is renowned for its speed. On the flat upper portion of this *karunga* are incised circles with an enclosed cross (*tui*); they represent the flowers or seeds of the mangrove, a tree which "derives its strength and life from contact with salt water"; between the *tui* are angular markings said to represent the *bubuna* fish. The base of the *karunga* is lashed to the float with strings of coconut fiber and in one or two canoes Chinnery noticed that it was sunk in a hole (*liuna*) in the float and then lashed. In some canoes the connection with the float is reinforced by two small hardwood pegs (*tukue*) to insure greater stability (fig. 91, *c*).

In some canoes (figs. 90, 91, *e*) the stanchion is strengthened by two thin forked sticks (also called *aigagaum*) inserted into the float on each side of the stem of the *karunga* and *papasa*. The long fork or branch of each is at first a few inches below the boom, and then runs along the under side of the boom to which it is lashed; additional pegs (*tukue*) may also be present. An outer, longitudinal stringer (*aipalau*) is sometimes laid over the booms and under the rope (*aigagaum*) at the point where its inner half is fastened to the boom.

The stanchion by which the central boom is attached to the float is called *papasa* (fig. 91, *g, h, i, j*) and the method of fastening it to the boom is similar to that described above. Swaying from it are leaves of *sausau* and *oni*. The *papasa* is in the form of an inverted T. The foot or horizontal part (*keke*) is fitted to lie along the top of the float, to which it is attached with lashings of coconut fiber which fit into grooves cut in the top of the *keke* to prevent slipping. Sometimes the *keke* is secured to the float by means of wooden pegs, and *tukue* may also be added, or according to one sketch it may be inserted into the float (fig. 91, *g*). The vertical portion of the *papasa* is carved more or less in an anthropomorphic manner. The top of one (fig. 91, *i*) represents a man's hat (*aia koru*), and ringlike carvings below are armlets (*maro-*

rieni). The top of another (fig. 91, *h*) represents a human head. Some of the canoes are without the *karunga* and *papasa;* these have two booms, each of which is connected with the float by means of two pairs of undercrossed sticks (*tukue*) which are knocked into the float (Chinnery, 1927, p. 183 and pl. 31). A few sticks are lashed across the booms to make a temporary platform. The canoes are paddled and poled. Those in use at present are small craft which will not hold more than six or seven persons. Paddles (*ose*) are shown (fig. 91, *k, l*).

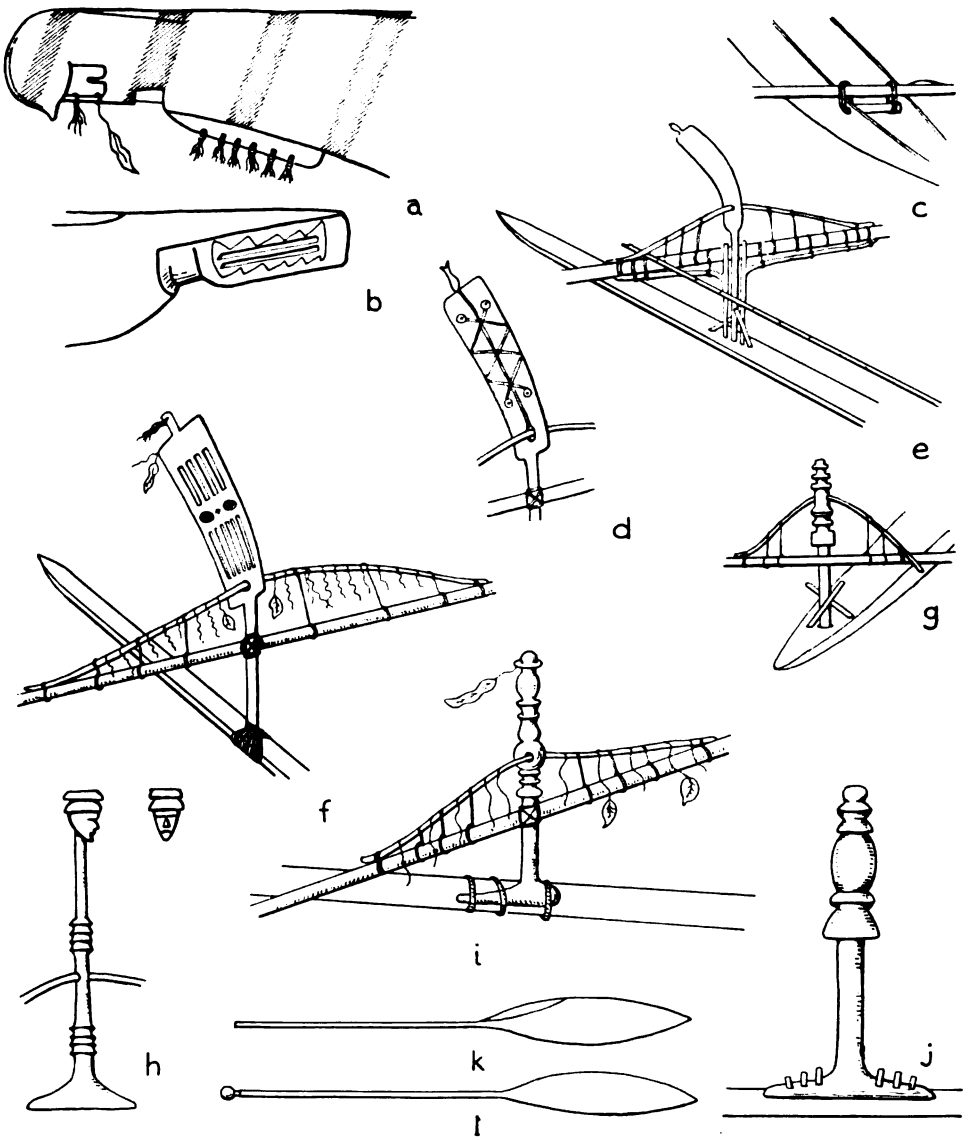

FIGURE 91.—Details of canoes, Emira Islands: *a, b,* two forms of bow; *c,* attachment of boom to hull; *d,* aft *karunga*; *e, f,* two types of fore *karunga*; *g-j,* four types of *papasa*; *k, l,* paddles (after Chinnery, 1927, vol. 2, pp. 178-182).

The short account given by Parkinson (1907, p. 343) does not add to the information given by Chinnery. He says that most of the canoes would hold only two or three persons, but some could accommodate ten men.

Friederici (1912, p. 273) has given a few particulars about these canoes. The float (*samana*) is generally on the starboard side. They are strong dugouts with similar pointed ends and without strakes or end-pieces. He calls the carved knob at each end *uruna* and the hole in its base *pisina*. A coconut-fiber string (*bobau*) fastens the outrigger booms (*yero* or *iyero*) to the hull and to the stanchions (*papasa*). A bast or liana (*oala*) fastens the stanchions to the float. He gives these terms: paddle, *ose*; coconut bailer, *koikoi*; triton trumpet, *kauve*.

MUSSAU (ST. MATTHIAS)

When Parkinson (1907, p. 328) went to Mussau in 1903 he found the canoes (*olimo*) to be undecorated dugouts of various sizes and with outriggers. Some vessels were so small as to hold only one man or at most two, others held eight to ten men. The people were not good sailors and seldom left the coast. In 1905 (1907, p. 334) he found on the east coast canoes 24 meters long, carved and painted at each end with great care and not without artistic skill. The vertical sticks of the outrigger apparatus were carved and painted in gay colors. The perforated carved work at each end of the canoes strongly reminded him of similar work in Kaniet. These vessels were built to hold 30 to 40 persons.

Chinnery (1927, no. 2, p. 184, pl. 30) says: "In St. Matthias the vessels are much larger [than in Emira], but they are of the same type, although the carving is much more elaborate."

A drawing of a Mussau canoe is given by Vogel (1911, p. 22). It is a narrow dugout with carving on the under side of the flat projecting ends; the work at the bow is longer and more elaborate. There are three booms and a long float. The stanchion connectives are of the same two types as those given by Chinnery. He gives a drawing (1927, no. 2, p. 60) of the fore end of a "Festboot"; the carving at the extreme end represents a bird holding a fish in its claws and biting the mouth of the fish. There are painted designs on the bow quarter. According to Nevermann (1933) there are only two booms in the Tench Island canoe.

NEW BRITAIN (NEU-POMMERN)

The ethnology of New Britain is as yet insufficiently known for us to demarcate the various ethnological areas and the ethnic and cultural movements of which they are the expression, nor can we assert that the distribution of the types of canoes accurately corresponds with such areas. The eastern part of the Gazelle Peninsula and the adjacent islands have been dealt with as belonging to the area of southwest New Ireland. The geographical order adopted is to proceed along the north coast and then pass round the western end to the south coast. Before describing the canoes of the south coast, those of the Siassi Islands are dealt with as it is more convenient to do so here than in connection with New Guinea.

North Coast

THE NAKANAI

Powell (1883, pp. 194, 215, 229) was the first to recognize that the people who live along the north coast from the western shores of Gazelle Peninsula to Willaumez Peninsula are a finer race with more clearly cut features and of a lighter shade than those of the Gazelle Peninsula. He compares them with the natives of the northeast coast of New Guinea and refers to the "Jewish look that is possessed by the western natives in such a marked degree." Romilly (1887, p. 20) also contrasts the very fine, fierce people of the west with those of Wide

Bay. Parkinson (1907, p. 54) says that on the north of the island the relationship with New Guinea is less noticeable than in the south. One stock occupies the whole coast as far as Open Bay, French Islands, and Duportail Island. On his map he places the Nakanai in the northern part of the west coast of the Gazelle Peninsula, but Vogel's map (1911) shows their distribution from Open Bay to beyond Willaumez Peninsula inclusive. He places the Talassea between the Nakanai and the Barriai.

Parkinson (1907, p. 240) states that among the Nakanai, at South Cape, and in many places at the west end the canoes are simple, long dugouts with single outriggers. Both ends may be ornamented similarly in flat relief enhanced with painting, but in most canoes the ends are without ornamentation. The Nakanai take great care to protect the canoes from the sun when not in use. Stephan and Graebner (1907, p. 193) state that according to the manuscript and sketches of Busse in the Berlin Museum the connectives of the Nakanai canoe consist of crossed sticks.

The only definite information available on the Nakanai canoes is that given by Friederici (1912, pp. 269-272). He says that the easternmost boundary of the Nakanai is at the villages of Nessai and Tongan at the base of the Gazelle Peninsula, and he seems to regard Willaumez Peninsula as the western boundary. He looks upon all the area to the west as far as Kalingi and including the Witu Islands as one ethnographical province. The farther east one goes the less the influence from New Guinea is seen. The following description is based on Friederici:

> The hull is narrow and the length ranges from very small canoes for only one person to those 10.6 meters long, at Tonga, or 13.18 meters, 14.13 meters, and 20.26 meters at Nessai; the last had a breadth of only 0.67 meter, the greatest breadth measured. These long narrow hulls have a tendency to warp, hence they acquire a corkscrew action in movement and become useless before they are worn out. The ends (Friederici, 1912, figs. 74, 75) are produced into a flat shelf which is especially long and narrow at the bow. There are no strakes or gunwale poles. There are usually two very long booms amidships. The float is short and cut off sharply aft. The attachment consists of two U-shaped withies which are lashed to the float, and crossed under the boom, which is tied to the crossings.

Friederici (1912, fig. 73) shows two crossbars between the limbs of each connective; probably the upper of these is meant for a short stick on the crossings as in the Witu and Kombe canoes; the other lies below the crossings. The use of the double U-withy attachment extends from the extreme east of the Nakanai country to that of Kilengi, though to a much less degree is it found among the Kilengi as they are influenced by the undercrossed attachment of the Siassi Islands and of New Guinea. Out of ten canoes seen by Friederici at Nessai, nine had the double U-withy attachment and the other came from the Gazelle Peninsula. Throughout the whole area the outrigger is apparently either to port or starboard. The narrow platform of rough sticks is laid along the booms and extends for some distance on each side of the hull.

WILLAUMEZ PENINSULA AND WITU OR VITU (FRENCH) ISLANDS

The government station of Talasea is in Garua Harbor at the center of the east coast of Willaumez Peninsula. The ends of the local dugouts (*anga*) (fig. 92) are prolonged into a gradually rising square-ended spur which has a horizontal hole through it. There are no washstrakes or gunwale laths. A thwart lies under each boom, the upper border of which is slightly concave; the ends extend well outboard. On the upper border rest several longitudinal poles which run

from one thwart to the other and constitute the foundation of a central platform of transverse laths; the ends of the laths are kept down by two poles across the booms. Two straight booms, which are lashed to the ends of the thwarts, pass over the ends of the platform poles and keep them in position. There is a long, thin, canoe-shaped float. The attachment is precisely like that used in the Witu Islands. There seems generally to be a stick under the boom and over the crossings of the withies. The under sides of the bow and stern and of the fore end of the float are painted with curvilinear patterns.

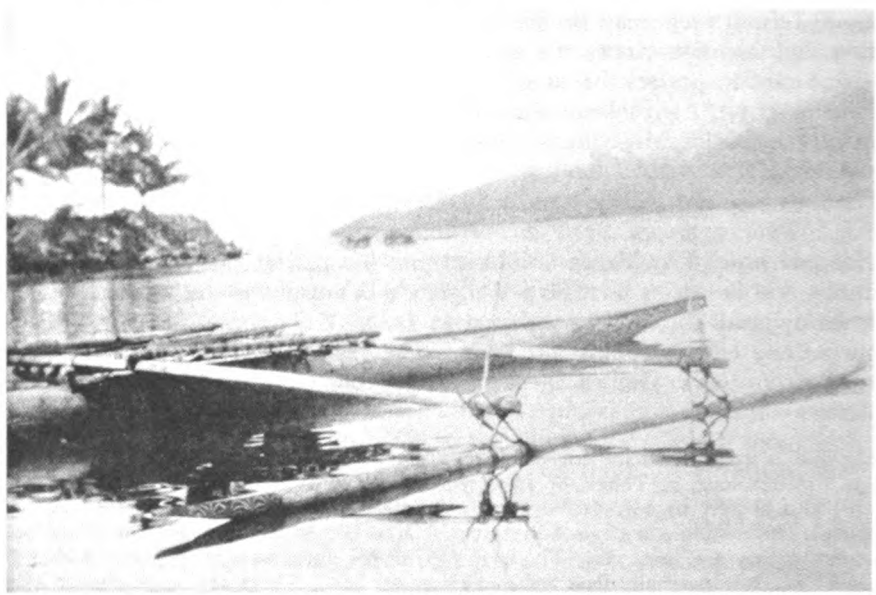

FIGURE 92.—Canoe (*anga*), Talasea, northern New Britain (photograph by E. W. P. Chinnery).

Chinnery has given me some sketches and notes made by him at Bulu, a village near the northwest corner of Willaumez Peninsula, where he says

. . . the canoes (*anga*) are low dugouts, some about 40 feet long. The booms (*gaigai*) are attached to the float (*baulo*) by two U connectives (*lok*). The platform (*kilkakai*) is supported by a thwart (*tui*). The paddles (*wok*) have long blades. A pole is called *wango* and the scoop bailer, *pinelo*. The hulls are painted at the bow (*niaro*) and at the stern (*bu-una*) with designs representing fishes, stones, leaves, eyes, human tongues, and other figures.

The following information is based upon sketches and notes kindly provided by the Reverend V. H. Sherwin:

At Dolli village, Witu, the canoe (*wanga*) has horizontal projecting solid ends with a horizontal hole (fig. 93, *a*) at the bow (*munga*). There are two thwarts (*tui*) lashed to the hull, the ends of which rest on the gunwales; they support the booms and platforms (fig. 93, *e*). On the *tui* are placed longitudinal poles (*burrau*) and over these above the thwarts are the two booms (*gandaw*), each of which is attached to the long float (*lama*) by a double U-withy connective (*gwau*); these are lashed to the float, the limbs of one U are tied to those of the other where they cross, and over the crossings is laid a stick not more than 3 or 4 feet in length, above which is the boom; the connectives, stick, and boom are firmly lashed together (fig. 93, *b*). The stick acts as a cushion or buffer for the boom, so that when the float is lifted up by a choppy sea, the resulting jar is taken by the stick and is distributed more evenly upon both crossings of each attachment than would be the case if the boom rested

directly on the crossings. The platform (*veraw*) is composed of transverse laths (*pawlu*) which are of bamboo or of the bark of the areca palm, which occasionally extends some distance fore and aft beyond the booms and also outboard; the ends of the laths may be clamped between two poles. The port side is called *kata* and the starboard, *lama*. When the canoe is on land the float is supported off the ground upon forked sticks. Other canoe terms are: stern, *murri;* cross struts in the hull, *timbawm-baw;* lashing, *kurriga;* paddle, *vavli;* pole used in punting over shallows or reefs, *taua*. Sherwin writes *aw* for the sound of "awe"; Chinnery writes *o*. Chinnery gives *livogana* for the hull of a *wanga* and *gama* for the float at Doliu, Vitu.

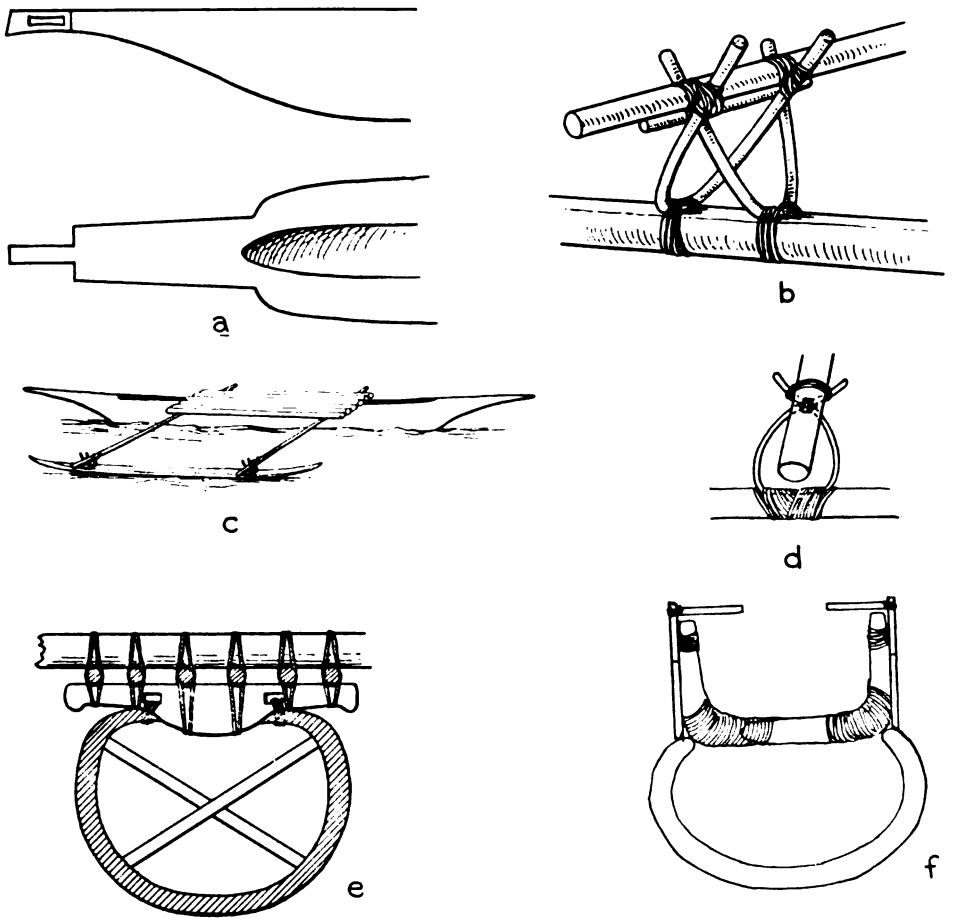

FIGURE 93.—Details of a canoe (*wanga*), northwest New Britain: *a*, side and upper view of one end, Witu; *b*, attachment, Witu; *c*, side view of a canoe (*waga*) Kaliai; *d*, loop attachment of a *waga*, Kaliai; *e*, section of a canoe at a boom showing internal struts, Witu; *f*, section of a Siassi two-masted canoe, showing knees (after sketches by V. H. Sherwin).

The following prohibitions concerning the building of canoes were obtained by Sherwin at Dolli:

The area in which a canoe is being built is enclosed by a fence made of bushes, to screen it from public gaze.

A prospective father or mother may not see a canoe being built just before the birth of a child, otherwise ill luck would happen to the child; it might be malformed or have an accident during its early years, resulting in the fracture of a leg or an arm. Neither a husband nor a

wife may see the canoe during the time the woman has her menses. No man who has seen a dead body is allowed to look at a canoe in the making, nor are mourners permitted to look at it. No canoe-builders when at work may take part in a burial ceremony or see a dead body during the funeral rites. The period of prohibition extends from two weeks to two months or more. Should any of these prohibitions be broken, bad luck will dog the canoe and early disaster will result. A dance and feast accompany the launching of each canoe.

In the old times the Witu Islanders used to wait for the lull between seasons and paddle across to the Willaumez Peninsula in their outrigger canoes, a distance of 35 miles of open sea to the extreme point of the peninsula. They had no sailing vessels and numerous disasters befell the frail canoes. They traded pigs for shell money and obsidian from the peninsula, and indirectly obtained native-grown tobacco from Kalingi, baskets from the neighborhood of Sagsag, and various kinds of carved wooden bowls and clay pots made in New Guinea from Tuam.

Stephan (1907, p. 127, pl. 8, fig. 2) gives a colored drawing, with explanations of the painted designs on the sides of the bow of a model canoe from Kaloga, Witu Islands:

The ends of the hull slope up to a squared end. A platform is built over the two booms and extends beyond the hull on both sides; the whole structure is fastened and supported on each side by a perforated and painted board or thwart [*tui*], the lower portion of which fits into the cavity of the hull. The float is as long as the hull, from which it is widely separated. The attachment for each boom consists of two U connectives which cross under the boom.

A photograph by Speiser shows a long, slender canoe constructed as follows:

The solid end is prolonged horizontally to a blunt point; this prolongation clears the water. The orifice of the dugout is extremely narrow. The two long booms are simple poles amidships and are supported well above the hull by raised thwarts. The small platform of transverse sticks supported by longitudinal poles extends rather more beyond the off side of the hull than beyond the outrigger side. The very long and slender float is pointed at each end. The attachment consists of a pair of U connectives that cross under the boom; they are lashed to the float and to the boom.

Parkinson (1907, p. 241) says that in the Witu Islands, and farther to the west end of New Britain, are fine sea-going vessels which are propelled not only by spade-shaped paddles but by sails which have the same form as those of the Tami Islands.

About 1884 Finsch (1914, p. 479) saw near Cape Raoult a canoe about 40 feet long which came through the surf with 20 men on board, 12 of whom were on the platform.

West End of New Britain

Through information given to me by the Reverend V. H. Sherwin, I gather that the territory of the Kombe (Kobe) extends west of Willaumez Peninsula to Cape Kirchoff east of Rein Bay, that of Kaliai extends westward to about Cape Raoult, that of the Wariai to Rottock and Börgen Bays inclusive, and that of the Sahe from Cape Kiepert to the middle of Zöller Bay. The territory of the Kalingi (Kilengi) stretches from Zöller Bay down the west coast to about 15 miles north of Sagsag.

The Wariai are the Barriai of Stephan (1905, pp. 205, 216; 1906, p. 14), who says they live east of Cape Gloucester. Friederici (1912, p. 27, map p. 26) states that the Barriai villages lie between the Ilulia and Gurisi Rivers, immediately east of Zöller Bay, and that the Kobe (Kombe, Kambi) inhabit Batumot Bay (Eleanora Bay) east of Molangai Point (Rüdiger Point) and the outlying islands, Nubareke and Nukaku, and the islets in the bay.

Sherwin's sketches show that among the Kombe, Kaliai, Wariai (Barriai), and Sahe, the hull of the small fishing canoe (*waga*) has the prolonged ends characteristic of the whole of the northwest of New Britain (fig. 93, *c*). There are no strakes. The two booms (*arauni*) are amidships and extend a short distance on the off side and are lashed to the edges of the dugout. The float (*samani*), with its ends slightly turned up, is about as long as the water line of the hull. The attachments (*gai-ira*) consist of bent withies made from a green branch of the mango tree, heated in the fire and bent (fig. 93, *d*). All lashings are called *ahila*. There may be a rather large platform (*pawlo-pawlo*) of longitudinal laths which extend fore and aft beyond the booms.

Sherwin informs me that among these four peoples there are two types of withy connectives, the loop and the double U: 1, The loop attachment, which has not been recorded from elsewhere, consists of a withy bent upon itself. It is firmly lashed to the top of the float and the limbs are tied where they cross each other; the boom rests on the crossing and is lashed to the free ends of the loop (fig. 93, *d*). Each of the two booms has two of these attachments side by side but not very close together (fig. 93, *c*). 2, The double-U attachment is similar to that employed by the Witu Islanders (fig. 93, *b*) and the Nakanai. It is more prominent at Kombe and Kaliai.

A double-U attachment is found at San Cristoval and in the Tongan Islands, but in these two areas the U connectives cross over the boom. Among the Kalingi there are few double-U attachments; the local type is that of two pairs of undercrossed sticks for each of the two booms, as in the Siassi Islands. So far as Sherwin could gather, for deep-sea voyages the float bears the strain and the undercrossed stick attachment is employed whereas along the coastal villages, where short trips are made, the withy attachment is adequate.

According to Friederici (1912, p. 270) the withy (Moluccan) attachment and the linguistic evidence indicate that the inhabitants of the north coast of New Britain came from the Moluccan-northeast Celebes-south Philippine line and that they reached their new home in one migration and are a relatively recent element in Melanesia. He discusses (1913, pp. 5-13, 17-18, 36) this branch of his Alfuran migration.

Stephan (1907, fig. 103) gives a photograph of a model of a Barriai paddling canoe made at Selin. The bow and stern slope up to a squared end, but at the bow this is prolonged into a long bar. He also gives colored illustrations and explains the decoration of the canoes and their parts (1907, pl. 8, fig. 3; pl. 9). At the end of the bow of one vessel is carved a fish hawk (*saumui*) for fish magic. This bird, according to local legend, emerged with the first men and women from a hole in the rock hidden beneath a pool of fresh water at the back of Mount Talawe. The two carved and painted transverse boards or thwarts which support the booms appear to fit into the cavity of the hull. The platform consists of transverse poles between the booms supported on longitudinal poles. The short canoe-shaped float is attached to each of the two booms by two pairs of undercrossed sticks. Except for the method of attaching the float to the booms, indicating influence from the Siassi Islands, the Barriai canoe is practically identical with that of the Witu Islands and Talasea.

There are no large two-masted canoes along the Kombe-Sahe coast as the natives make only coastal voyages, though the Kombe people visit the neighboring islets. They have some one-masted canoes which are of simpler construction than the two-masted canoes of the Siassi Islands and can be managed by two men.

Sherwin gives the following terms for sailing canoes: mast, *na-paila*; sail, *moi-ie*; deck (one only) *pawlo-pawlo*; stays, *ahila*; halyard and other sail ropes, *na-leli*; steering paddle, *pawri*; bailer, *na-luma*.

At Kalingi village, according to Sherwin, there are a considerable number of the large two-masted canoes (*na-auga*) which are either imported from Tuam or visitors, and also one-masted canoes (*na-saliu*). This place is an important trading center, with pigs and native tobacco as exports, and also as an agency for the Tuam trade. The Tuam men bring clay pots and carved wooden bowls from New Guinea and these are traded from Kalingi along the north coast to Kombe and even to Garua, an island off the east coast of Willaumez Peninsula.

Since the Kalingi people purchase their large canoes from the Siassi Islands there is no need for a description, but they must have had sailing canoes of their own for their canoe terminology is quite different from that of the Siassi Islanders, as is also their language. Whenever the Tuam people come to Kalingi they converse with the natives in the local language, as they do in New Guinea (Sherwin, manuscript). According to tradition there was trouble in the island of Tuam and half the population came across to New Britain, left their large two-masted canoes at Kalingi, made smaller paddling canoes, and eventually settled at Kaliai. Tuam and Kaliai have many words in common, and between them exists a very friendly attitude.

There is an important trade route between New Guinea and New Britain with the Tuam and Siassi Islanders as the principal connecting links. Articles of trade such as are only made or traded by the people of the Siassi Islands are found in abundance as far away as Witu. Undoubtedly, as Sherwin states, this long-existing trade has been the means of neutralizing any warlike tendencies, which are far more in evidence along the south coast than along the north coast of New Britain. It also facilitates spoken intercourse; thus with a knowledge of the Kalingi language there is little or no difficulty in trades being understood from Sagsag to Garua Island or the neighboring Talasea village on the mainland, a distance of nearly 200 miles. Along this coast the Kombe seem to have been the only people who gave serious trouble in the past; here the continual fighting became so acute that a whole island population took canoes and went westward to settle in the Sagsag district. They still speak the Kombe language but are able to converse in Kalingi because their western border forms the eastern border of the Kalingi district.

In former times the Kalingi and Sagsag people had big canoes and used them extensively and doubtless made them, though they may have bought some from the Siassi Islands. The principal cause of the neglect of canoe-making and sailing was the smallpox scourge which decimated and in some places wiped out villages some 15 or 20 years ago. The old men who possessed the art of canoe-making and sailing succumbed, leaving a few children who were too young to be instructed. Many of the present villages in this area are composed of the scattered remnants of previously large villages. Sagsag, which is about 15 miles south of Kalingi, is now composed mainly of the descendants of survivors of four or five hill villages who combined to form a village after the smallpox epidemic. The art of canoe-making naturally declined, as the hill people did not possess the art of making seaworthy canoes. The hill people who are now on the coast have no knowledge of seacraft. Even if they had a desire to possess canoes, they would not have a sufficient number of pigs to pay for them (in 1931). The Tuam traders who come across to New Britain still make their first stop at Sagsag before continuing their journey to Kalingi.

Siassi Islands

The Siassi Islands lie south of Umboi (Rook Island). The small island of Aramot is close to Umboi at the end of Dampier Strait. Malai (Malei, Malawaia) and Mandok are at the end of Vitiaz Strait and Tuam is south of Mandok. There are other small islands that need not be mentioned. Chinnery (1928, p. 36) describes the canoes of Aramot and Mandok as follows:

"Canoes of all sizes were seen. Some of them were sailing canoes with high masts and built-up washstrakes, while others were ordinary dugouts without washstrakes or masts. All were carved [1928, pls. 46-48]. . . . The people are famed as canoe builders and sailors. The trees for the canoes are purchased on Rook Island. . . Each canoe carver is said to have his own special form of decoration, and builders of canoes are known by the form of carving employed. Sons inherit the right to use the decorative forms of their fathers, by whom they are also taught canoe building. The canoes (*waang*) are sold to people of Tuam and Malei, who have no suitable timber on their islands, and who are too far from Rook Island to go into this industry themselves. The Aramot and Mandok canoes are also sold to the natives of New Britain, even as far along the coast as Gasmatta."

Chinnery (1928, p. 41) says that the Siassi people visit New Guinea in the southeast season with supplies of red paint and obsidian purchased from Kalingi. Dogs are bought at Arawi (Lovely Islands) and other places, and ornamented arm-bands (*dara*) of which shell money (*si*), purchased from Arawi, is the principal decoration. They bring back from Tami Island carved wooden bowls (*on*). Strings of dogs' teeth and netted bags ornamented with dogs' teeth are bartered for live dogs and *dara*.

The Reverend V. H. Sherwin informs me that the making of the two-masted canoes is confined to the two small islands of Aramot and Mandok, and that the Tuam people buy them from these islanders. He says:

The timber used for the hull is extremely durable and will last for 20 or 30 years. This is obtained from the hills on Umboi. The owners of the ground on which the tree is growing are paid with dogs or dogs' teeth, shell money, or small pigs. The 40 or 50 men from local villages, who cut down the tree, partly hollow it out, and haul it to the seashore, are paid with food. The craftsmen at Aramot or Mandok who do the carving and make the rigging are paid three large pigs with fully developed tusks. At present there are only three such craftsmen on these islands. Recently there was a quarrel between the men of Tuam and those of Aramot and Mandok over the inferior quality of the timber employed in making the deep-sea canoes. So the Tuam men went to Umboi and bought two trees, paying the local people to haul them down to the shore, and a good Tuam craftsman completed the canoe.

The Tuam people, who are great traders, buy earthenware cooking pots and carved wooden bowls in New Guinea and take them to Kalingi in New Britain, whence these utensils are traded along the north coast as far as Garua or Talasea.

The large Siassi canoes are used along the south coast of New Britain as far as Arawe, and for many years friendly relations have been maintained between the Arawe and Tuam people.

Except for the craft of Manus, Admiralty Islands, the Siassi canoes are the largest and most seaworthy in the Mandated Territory. They are essentially deep-sea canoes, well built and capable of withstanding the tremendous strain they have to bear in weathering the storms of Dampier Strait. If the wind is too strong, the two sails are furled and the float is kept broadside on the seas. The safety of the vessel depends upon the solidity of the float and the elasticity of the outrigger apparatus. With a fair wind aft, or on the quarter, these two-masted canoes can cover 60 miles quite easily between sunrise and sunset. The Tuam boys are taken on trips to learn the management of the canoes, which requires a fair knowledge of

sailing and seamanship. Sherwin informs me that the length of a Siassi canoe is about 30 feet. It carries a crew of six men and has a cargo capacity of about three quarters of a ton, or more, with compact stowing. He says that although the natives of the various islands of the Siassi group speak different dialects of the same language they have a common terminology for all that relates to their canoes. The guttural *ng* is common in the dialects of the north and south coasts of New Britain; as the *r* is frequently pronounced with a distinct "trill", the *rr* is employed by him to indicate this sound.

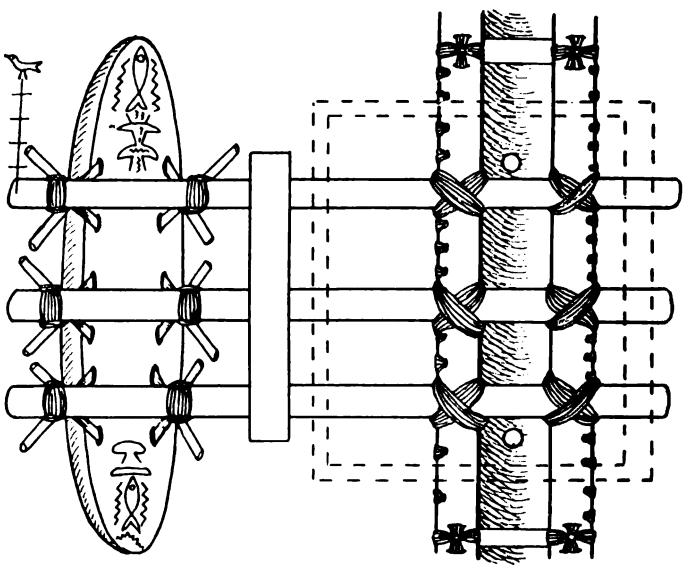

FIGURE 94.—Outrigger apparatus of a two-masted canoe, Tuam, Siassi Islands, the two platforms indicated by dotted lines (after a drawing by V. H. Sherwin).

TWO-MASTED CANOES

Sherwin has very kindly given to me drawings and notes on the construction of the fine sailing canoes of the Siassi Islands and Kalingi and it is mainly from his material that the following description is taken. The superficial observations of earlier writers do not afford much precise information about these craft, but models of canoes from Finsch Harbor and Tami show the general structure very well, though the details may not be quite accurate. More precise data can be obtained from various photographs I have examined. Chinnery (1928, pl. 49) gives a photograph of a two-masted canoe at Tuam, and Parkinson (1907, pl. 7) shows one seen on a visit to Arawe. Some two-masted canoes at Mandok, shown on a small scale (Schnee, 1920, vol. 3, pl. 180), conform to the account which follows. Divergences in details, some of which may be local, are duly noted. I have adopted Sherwin's terminology. The first term is the Tuam name, the second the Kalingi name:

The hull (*wang, na-auga*) of the two-masted deep-sea canoe (*de wang, na-auga*) is a dugout with rounded sides. The ends sheer up and are produced into a long solid beak (*wang nagau, na-auga ramwa*) that rises to a slightly higher level than the body of the hull and is flat on its upper surface. The sides and upper surface are variously carved and painted. The sides of the hollowed-out portion are raised by two broad painted strakes, carvel-built and

sewn on (fig. 93, *f*). A batten (*bubarr, nasa-urra*) of areca palm or of bamboo is sewn on over the junction of the topstrake (*sung yat, nariu*) with the lower strake (*diu, nariu*). All seams are calked with *zimirr, narai-ilu* (probably *Parinarium*). A narrow, horizontal gunwale plank, or combing (*rrawb, navanava*) is lashed to the edge of the topstrake and projects inward, thus reducing the aperture of the hull and doubtless keeping some water out. The ends of the strakes are enclosed by breakwaters (*dumdam, nasa pavela*) which fit on the solid upper part of the hull and project far above the strakes into a variously carved, painted, and sometimes perforated gable end. There are four pairs of knees (*aitu, nakaituka*), the horizontal limbs of which are tied together (fig. 93, *f*). The vertical limbs are tied to the strakes, presumably the elbows rest on the edge of the dugout. Numerous thwarts (*kaipavel, napunvava*) are lashed beneath the gunwale plank. The three straight stout booms (*tiavong, nakiaro*), which are rather close together amidships, rest on the gunwale planks and are securely lashed; they extend for some distance on the off side. The massive float (*malib, na sama*) is a rather short stout log slightly raked and bluntly pointed at the ends, it may have a circumference of 4 or 5 feet at the center, its broad flat upper surface may be decorated with carving (fig. 94). The attachment consists of two pairs of undercrossed sticks (*patavel, napatutu*) of mangrove wood; they are inserted near the sides of the upper surface of the float and each pair diverges from the other.

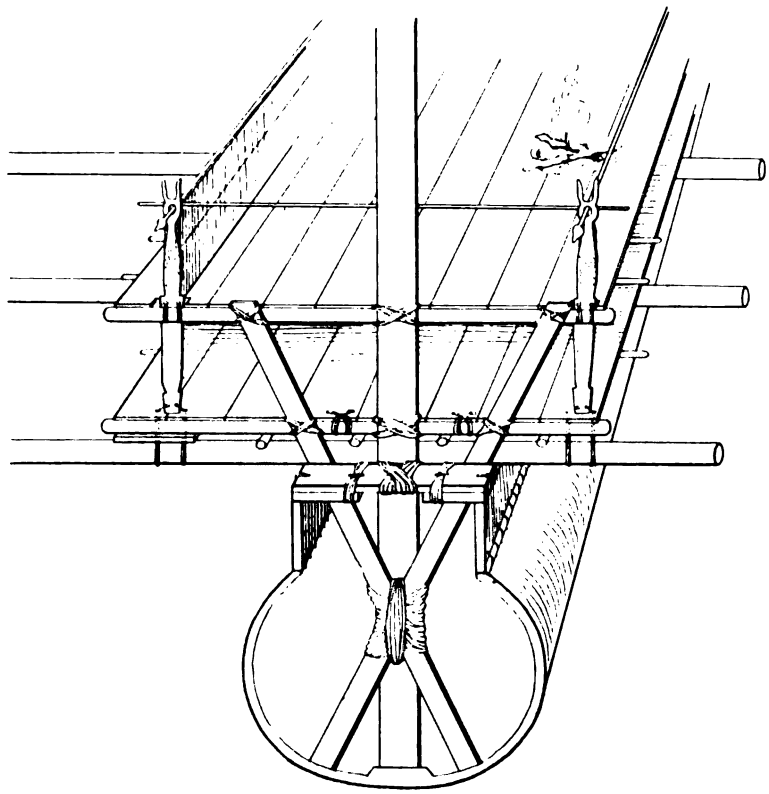

FIGURE 95.—Platforms and stepping of mast, two-masted canoe, Tuam, Siassi, diagrammatic perspective; there should be two strakes on each side, raising the lower platform proportionately higher above dugout (sketch by V. H. Sherwin).

There are two platforms, a lower platform (*atun sina, ro unsiu*) for the cargo, and a slightly smaller upper platform (*atun sanga, ro unsiu aylut*) for the crew. The lower platform is formed of longitudinal planks and extends for some distance beyond the sides of the vessel (fig. 95). Between this and the float there may be a supplementary platform of poles, or a single plank may be laid across the booms as in figure 94. The platform is an oblong structure, the long axis of which is transverse to the hull. At Tuam, but not at Kalingi, there is a plank (*sawngan*) above the three booms to support the outrigger side of the platform,

and lying on the booms are several small longitudinal poles; over the ends of these and above the boom is a transverse pole on which the ends of the platform planks rest. On the longitudinal poles are a number of transverse poles that serve to stiffen the platform. Occasionally, according to Sherwin, the planks run transversely to the hull, in which case the underlying transverse poles rest directly on the booms. Apparently in some vessels the planks of the platform rest directly on the booms. The Köln Museum models of Finsch Harbor canoes show a slightly carved, low vertical board on each lateral side of the platform and on its off side is also a screen of boards which usually has a hole through it.

The upper platform consists of longitudinal planks, stiffened by supporting transverse poles, the ends of which are lashed to the sides of the outer planks. There is also a fore and an aft transverse pole on which the planks rest and over which they project. Apparently in some canoes the platform is boarded over completely, but models show that the part on the off side of the masts is not covered over, and these have the low vertical boards as in the lower platform. The upper platform is supported fore and aft by the masts (*aitu*) and by lateral supports or stanchions (fig. 95).

Each mast is stepped on a projecting ridge from the floor of the hold and is lashed to a transverse timber (*dudang*) that rests upon and is secured to the gunwale planks; it passes between the *dudang* and the lower platform, and is lashed to the transverse pole on which the ends of the platform boards rest; it is similarly lashed to the corresponding pole of the upper platform. The *dudang* is absent from Kalingi canoes.

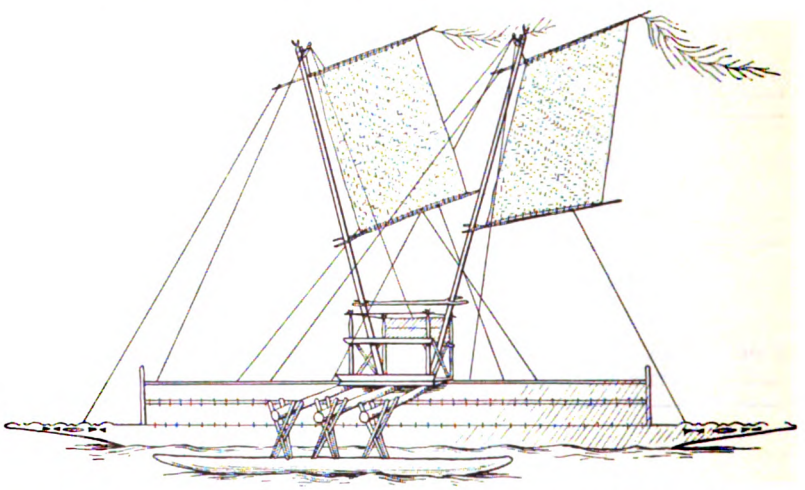

FIGURE 96.—Two-masted sailing canoe (*de wang*), Siassi (from a photograph; rigging from sketches by V. H. Sherwin).

The two slanting stanchions (*aitu, nakaituka*) are stepped on the floor of the hold, one on each side of the central ridge and of the mast, and are lashed together and with the mast where they cross each other in the hold; each is lashed to the two platforms in the same manner as the mast, all three passing between the *dudang* and the outer boom. The *aitu* scarcely project above the flooring of the upper platform. This arrangement is at the center of the fore and aft ends of the platforms. In a Bern Museum model of a typical Tami-Siassi craft from Simbang near Finsch Harbor, New Guinea, the stanchions are not independent structures but are the greatly prolonged vertical limbs of knees (*aitu*).

At each corner of the platforms is a carved boardlike stanchion (*awsawsweng, nanawaw*) which rests upon a lower platform plank; there are two holes at its base and two in the plank; a lashing passes through all these holes and then around the boom, thus securing the whole to the boom. The upper part of the stanchion passes through a hole or a notch in one of the planks of the upper platform, or it is sandwiched between the end of the plank and the pole that is tied athwart the ends of the planks; this particular plank is made slightly shorter than the other planks so as to accommodate the stanchion. Frequently it is not attached at all to the planks of the upper platform. The upper end of a stanchion is perforated. A longitudinal rail passes through the hole in the fore and the aft stanchion and a transverse rail is lashed to

the two fore and to the two aft stanchions. These rails may form the sole support of the stanchions apart from their basal lashings. In some Siassi, Tami, and other canoes there is no railing round the upper platform.

On the outrigger side the two stanchions are connected by a boarding (*atundaba*) of two planks. However, the Finsch Harbor and Tami models, and photographs by Chinnery of Tami canoes, and those by Speiser of Siassi canoes show that the upper platform is supported by two carved stanchions like the preceding, on the outrigger side only. On the offside end of the lower platform four long thin poles are erected which are joined by two or three crossbars. The two central poles are usually nearer each other than to the outer poles; the two transverse poles that support the upper platform are lashed to the two outer poles, as is the board screen of the lower platform, which often has a hole in it. The upper platform always carries a fire (*yub, maringa*) placed on a bed of damp sand.

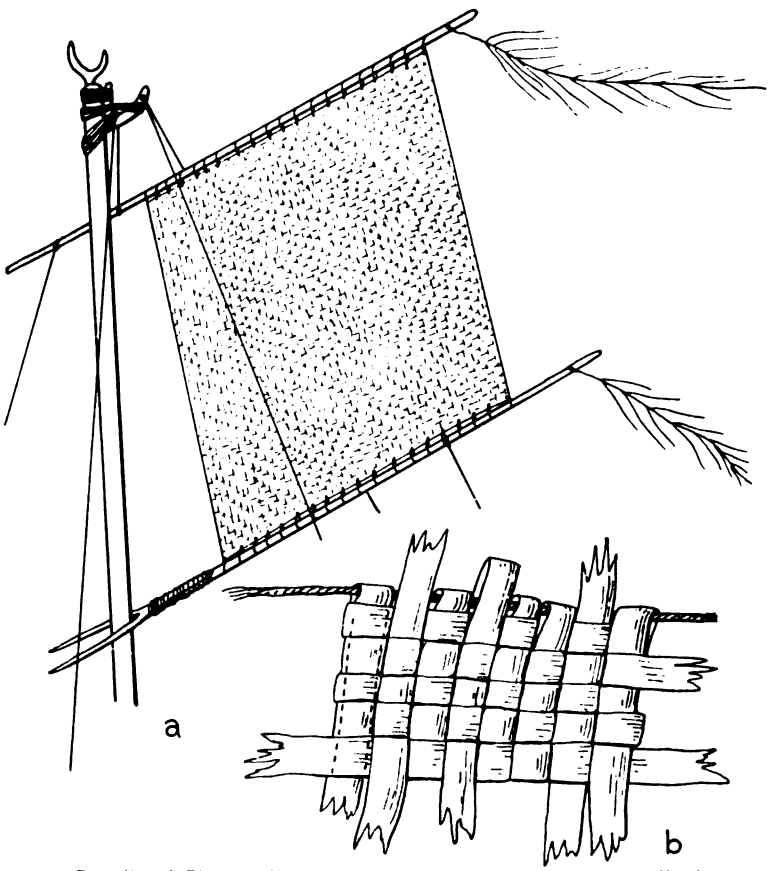

FIGURE 97.—Details of Siassi sail: *a*, mast with sail and ropes; *b*, detail of mat sail, showing the bolt rope (after sketches by V. H. Sherwin).

The stepping and securing of the two diverging masts as seen in Sherwin's drawings of a Tuam canoe have already been described: fore mast, *mawding imung, napala imuga;* aft mast, *mawding mura, napala ikirimi.* A few feet above the upper platform are two horizontal poles firmly lashed together side by side; each mast is clamped by the ends of the two poles and firmly secured, this device thus serves as a brace to keep the masts in position (fig. 96). An awning made of pandanus-leaf matting, similar to the local rain cloaks and sleeping mats, may be laid over this clamping device, the lower border of which is fastened to the top of the lateral railings or stanchions.

One limb of a V-shaped piece of wood, or a straight piece of wood with a branch coming from it (*gung, naginga*) is lashed to the top of a mast; the other limb projects upward at an angle; it has a hole through it near the tip and below this it is fastened to the mast by a horizontal lashing (fig. 97, *a*). The angle of the fork serves for the running of the halyard

(*rrabeng, nala enga*). The stays (*ayzurr, nakuil*) are rove through the hole in the *gung* and their ends are fastened to thwarts. An ornament, usually crescent-shaped, is inserted into the top of a mast (figs. 96, 97).

Each mast carries a rectangular sail (*lai-i, nale*). The sails are made of strips of pandanus leaf in check plaiting. At the edges of the sail the strips are bent over and worked into the plaitwork, a continuous series of loops is thus formed through which a bolt rope is passed and this prevents the edges of the sail from fraying (fig. 97, *b*). Two long spars, the yard (*sirrarr sanga, nasila*) and boom (*sirrarr singa, nasila*), are lashed to the sail. The halyard (*rrabeng, nala enga*) is fastened to about one quarter of the length of the yard, and a guy line or vang (*mungan, namuga*), passes forward from this end of the yard; that of the foresail passes to the solid part of the hull well in front of the strakes. A forked stick (*zawzaw, nagal pulu*) is lashed onto the foot of the boom, the jaws of which work on the mast. The sheet (*rrun, nalul*) is fastened at about one third of the length of the boom from its free end; that of the aft sail passes to the stern end of the cavity of the hull, well behind the strakes. Streamers (*rawbrawb, rawbrawb*) are attached to the free ends of the yards and booms, evidently to indicate the direction of the wind (fig. 97, *a*).

A model of a Siassi two-masted canoe with two outrigger booms is figured but not described by Stephan (1907, fig. 101). It shows the rig as described above, but the vang attached to each yard has another line fastened to it a short distance from its lower end. The A-like ends of both vangs are fastened at the fore end of the washstrakes. The sheets also have bifurcate ends and these are fastened at the aft ends.

It is risky to describe the standing and running rig of models in museums as there is always a possibility that they have been rerigged by someone who did not know precisely the original arrangement.

Neuhauss (1911, vol. 1, pl. 265) illustrates the very richly carved end of a Siassi canoe, which represents among other motives a crocodile in high relief eating a man's head; a *Nautilus* shell is fastened to the tail of the crocodile and is the family badge of the owner. The painted decoration of a model of a Siassi canoe is illustrated and explained by Stephan (1907, fig. 101; pl. 8, fig. 1). Chinnery (1928, pl. 47) gives a photograph of the carved prow of a Mandok canoe.

The bailer (*zawb, na-lima*) is a wooden scoop with the handle projecting horizontally inward; that from Tuam (Schnee, 1920, vol. 3, pl. 181, fig. 19) is carved and the end of the handle is continuous with the floor of the scoop. Both are of Oceanic type.

Sherwin gives the following terms: steering paddle (*paws, napi*); pole for use in shallow water (*tawg, natu*); mooring rope (*gun*).

A charm (*awitu*) may be fastened at the end of an outrigger boom at Tuam; it consists of a stick with crossbars with a wooden bird (*gul-lala,* sand snipe) on the top (fig. 94). A photograph by Speiser shows two thin longitudinal sticks attached to the ends of the booms, one on each side of the outer connectives. To these sticks are fastened four thin boards, cut to represent birds which have tassels depending from their beaks; they project well beyond the booms.

Chinnery (1928, p. 36) collected the following terms at Aramot and Mandok: canoe and hull, *wang;* platform, *atan;* outrigger boom, *tiong;* connectives, *patot;* float, *mali;* mast, *moding;* sail, *kel;* rigging, *rabrab;* sheet, *muri;* paddle, *pos;* steering oar, *pos si-ina;* pole, *iau.*

Chinnery (1928, p. 29, pl. 25) says that the Barim villagers on the southwest coast of Umboi are expert in making canoes which they sell to the Siassi Islanders, especially of Tuam and Malei, and shows a decorated canoe with the usual characters. He gives the following terms: canoe, *oga;* hull, *kulun;* platform, *kat;* booms, *kiada;* connectives, *dom;* float, *san;* mast, *begara;* sail, *lai;* rigging, *ri-e;* sheet, *iking;* paddles, *poi;* pole, *to.*

The canoes of Long Island, Vitiaz Strait, doubtless resemble those of the Siassi cultural group. Finsch (1888-b, pp. 27, 28; pl. 6, fig. 6; pl. 8, figs. 1, 2) gives rough sketches of canoe decorations.

SINGLE-MASTED CANOES

The one-masted canoe (*gawgawn, nasaliu*) of the Siassi Islands and of Kalingi has much the same structure as the two-masted canoe and the names for the several parts are similar. The mast (*mawding, napala*) is drawn by Sherwin as stepped immediately in front of the platform to which it is doubtless lashed. The two booms do not rest on the topstrakes but are lashed onto the upper edge of raised bulwarks (*pulkiarr, nariu*) which consist of a single board fixed longitudinally amidships on each gunwale plank or combing. The booms support a single platform (*atun, rounsiu*), which has a railing on the off side. There is no upper platform.

PADDLING CANOES

According to sketches received from Sherwin the small paddling canoe of the Siassi Islands and Kalingi (*gawgawn, na-auga*) that holds two men has two booms amidships that are lashed on to two thwarts (*gawgawn, napulupulu*); these have three holes, the two outer of which serve for the lashings of the thwart to the gunwales of the hull and all three for the lashings to the boom. The booms extend some distance on the off side and for a long distance on the float side; they are connected with the float by the usual two pairs of divergent undercrossed sticks. There is a relatively large platform of transverse planks. The dugout is without strakes and has the shape typical of the district. Chinnery (1928, pls. 46-48) figures a small Mandok canoe with elongated ends, the bow end is raked and carved. The two straight booms are amidships and are supported well above the hull by perforated boardlike thwarts (*tui*). There are two pairs of undercrossed connectives for each boom. A platform over the booms extends beyond each side of the hull; on the outrigger side there is a railing and on the off side a solid screen which has a hole in the center.

South Coast

On the south coast from about Cape Peddar and including the Arawe Islands to near Roebuck Point, east of Linden Harbor, there is a peculiar culture that distinguishes this area from the rest of New Britain, the most noticeable feature of which is the common occurrence of artificially deformed heads, like those of the southwest Malekula folk. In part of the area a very long blow gun is used.

Parkinson (1907, p. 241) says that natives of the southeast coast of New Guinea have been frequently driven to the south coast of New Britain. About 1890 a number of natives from the D'Entrecasteaux Islands were at South Cape and at Cape Gloucester, the northwest point of New Britain. There he found Trobriand Islanders who now speak the local dialect. These foreigners, however, appear to have had no effect on the local culture.

In reference to the villages of Anato (Gasmata), Vigilo (Moeve Harbor), and Kumbun (Arawe or Arawi Islands, Lovely or Lieblich Islands), Chinnery (1927, no. 1, pp. 9, 25) says:

"Outrigger canoes are made locally. They are dug-out vessels with two outrigger booms attached to a float of softwood by eight hardwood pegs, four to each boom. A small platform is built amidships across the booms, but no wash strake is attached to the hull. The canoes are propelled with paddles, and in the shallow water by long poles. Larger ones are some-

times sailed, the sail being a rectangular mat like that used in Siassi. In some of the villages are large two-masted sailing canoes with painted wash strakes and carved bow and stern. These are purchased from the people of Mandok and Aramot, two small islands in the Siassi group."

Chinnery (1928, p. 36, pls. 5, 7, 55, 78) says that such canoes were sold to the natives of New Britain "even as far along the coast as Gasmatta." In his photographs a railing is shown on the outrigger side of the platform of a Moeve Harbor canoe; in canoes at the mouth of the Ais River, and at Pulie River, the attachment is seen to consist of undercrossed sticks. The float is much shorter than the hull and is widely separated from it. The two booms are rather close together in the center of the hull. Parkinson (1907, p. 241, pl. 40) gives an excellent photograph of a canoe at Kombiuss, Arawe Islands, which shows all the above-mentioned characteristics. There are two pairs of undercrossed sticks for each attachment. He says that at these islands and thence farther west one sees large sailing canoes with two masts which are so common in New Guinea. The natives say that these canoes are bought in the west, but Parkinson did not see them at Cape Merkus and farther east. He gives a photograph (1907, pl. 7, p. 96) of a sailing canoe of "New Guinea type" at the Arawe Islands; it has three booms, each with apparently two pairs of undercrossed connectives, and two divaricating masts. It is of the Siassi type and may have been imported thence. A photograph by Speiser (fig. 98) shows what is probably a local manufacture of the Arawe Islands:

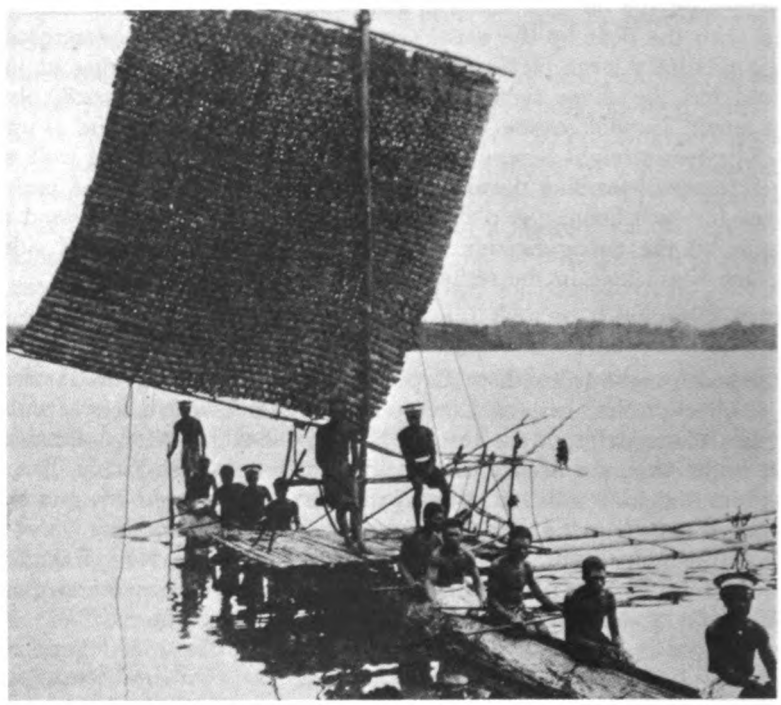

FIGURE 98.—One-masted canoe, Kumbun, Arawe Islands (photograph by Felix Speiser).

The dugout is plain and has no washstrakes. Three long booms amidships carry a strong platform that extends over both sides of the hull; there is a railing on the outrigger side. The single mast passes through the central longitudinal board of the platform and is steadied by being lashed between two transverse poles which are fastened to the central upright of the railing and supported at the other end on two large crossed sticks near the off end of the plat-

form. There is a large quadrangular mat sail. The paddles have no crutch and the blades are lanceolate, tapering to a slender point.

An excellent photograph (Meyer and Parkinson, vol. 2, 1900, pl. 21) shows a Moeve Harbor canoe; it is very long and narrow and the ends are produced to a broad projecting shelf. The three booms lie amidships; they are rather close together and project a little on the off side and a long way on the other side. A platform is built on the booms; it extends much farther on the outrigger side than on the other. There is a fore-and-aft, slightly slanting screen on the outrigger side. Each boom is attached to the float by two pairs of undercrossed sticks.

JACQUINOT BAY

Stephan and Graebner (1907, p. 193) say that throughout the greater part of the proto-Polynesian culture area the connection of the float with the booms is by means of crossed sticks, and also throughout New Britain, at South Cape, among the Nakanai, at Jacquinot Bay, and sporadically on the north coast of Gazelle Peninsula; their statements are too vague to be of any value. W. Schmidt informed Graebner that at Jacquinot Bay the people speak a Melanesian language with clear interspersed Papuan elements.

Speiser has given me a photograph of a canoe at Jacquinot Bay (fig. 99) which shows that the roughly-made dugout has ends somewhat like the bow of an ordinary European boat:

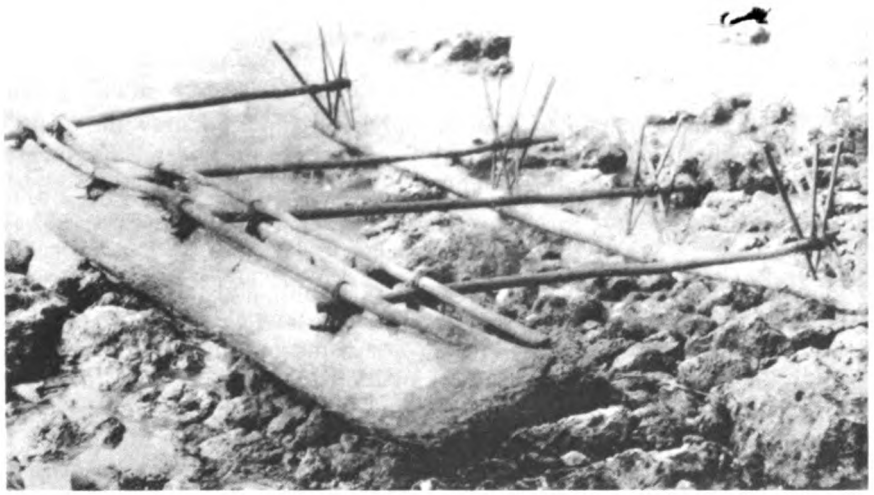

FIGURE 99.—Paddling canoe, Jacquinot Bay, southeast New Britain (photograph by Felix Speiser).

Of the four booms, the outer are near the ends and the two central ones are nearer each other than they are to the outer booms, the booms lie on the edges of the gunwale and two strong gunwale poles are lashed over them. A stout stick passes through the sides of the hull below each boom, the boom and gunwale pole are lashed to its projecting ends. There is no platform. The float is a pole as long as the hull and has bluntly pointed ends. Each attachment consists of two pairs of overcrossed sticks, which project far above the boom; the sticks of one side are usually inserted close together so that they have almost a V appearance. There is also a single, more or less oblique stick, which is lashed to the boom inside the attachment on the outer booms and outside the attachment on the inner booms.

Paddles from Waiu and Jacquinot Bay (Schnee, 1920, vol. 3, pl. 181, figs. 8, 13) have simple shafts and elongated blades.

THE SULKA

The Sulka live on the southern area of Wide Bay, and like the Baining and Nakanai speak a non-Melanesian language. Rivers (1914, vol. 2, p. 538) gives a summary of their culture which he regards as an example of the culture of the dual people in a purer form than obtains elsewhere in Melanesia.

Parkinson (1907, p. 241) says that the Sulka (outrigger) canoes are broader and roomier than those of the Nakanai. They are furnished at both ends with small projections, and have a sewn-on washstrake. The projections and strakes are ornamented with painting and these figures remind one of modern European decoration ("Jugendstil"). All the painting in this district is highly characteristic and nothing like it is found elsewhere. They use green and yellow as well as the ordinary red, white, and black pigments. I can find no information about the outrigger apparatus.

Father Meier (1914, p. 657) says that during the last 30 or 40 years, previous to 1914, no plank boats have been built by the Sulka and the related Mengen because of the long time it took to make them and there are no old ones left; but a Mengen man made one recently. These people know about the plank boat and call it *a monn* and state that their joint ancestor Nutt arrived in their land in a plank boat. The ornamented plank boat came later.

Finsch (1914, p. 480) refers to the isolated occurrence of plank boats without outriggers, similar to the *mon* of New Ireland (among the Sulka). This was noted by Vogel (1911, p. 163).

NORTHWESTERN ISLANDS

The northwestern islands of the Bismarck Archipelago are: the Admiralty Islands, the Kaniet Islands to the northwest, the Hermit Islands to the south, and the Ninigo and Maty islands to the west.

Admiralty Islands

The Admiralty Islands include about forty islands and have a population of about 30,000. Admiralty (Manus) Island, about 60 miles long, is the largest. Thilenius (1903, pp. 109-110) says the proper name for the large island is Taui, but Mead (1930, p. 371) shows Taui as an islet off the south coast of the main island. Thilenius (p. 117) groups the people into Manus and Usiai (roughly coastal or salt-water men and bushmen). On the large islands the Manus and Usiai have little contact with each other, but in the small islands there is a brisk trade between them. In some islands, as at Lo and Mok, there are no Manus; in others, as at Fidap, there are no Usiai.

Rivers (1914, vol. 2, p. 551), following Parkinson (1907), mentions three economic groupings of the population: Moanus (Manus), Matankor, and Usiai. Some islands and districts are inhabited more or less exclusively by one people, while in others two peoples live side by side or mingle with one another. In the southerly islands the Matankor are said by Parkinson (1907, p. 370) to be lighter in color and commonly to have curly hair, but some have quite straight hair and narrower noses than the Moanus and Usiai; one finds among them "Semitic" noses.

The Moanus live in houses on the sea and understand various means of navigating the canoe, and the use of the great fishnet. They have knowledge of the moon and stars and of

those kinds of magic in which betel and lime are used. The Matankor also understand the canoe and fishnet, but do not know the moon and stars or the magic of betel and lime; their houses are on the shore. The Usiai who live in the bush and grow taro and sago do not understand the canoe, the fishnet, or moon and stars. They are the backward, indigenous, bush agriculturists who are cannibals.

All accounts of the Moanus point to their being relatively recent immigrants who are still conquering and displacing the other peoples, having ousted the Matankor from certain islands or villages. They are headhunters, and their presence is probably due to a secondary migration from New Guinea, from a population which has been greatly influenced by the betel-people.

The Matankor are the most expert canoe-makers of the islands, but their ignorance of the stars suggests that they form an earlier immigrant population which has lost the art of the navigation that would have brought them from any great distance. They are the great carpenters and wood-carvers of the Admiralties. Rivers (1914, vol. 2, p. 553) adduces evidence to show that they were originally a kava-people.

Mead (1930, pp. 292-296) suggests that the foregoing classification is one that was made by the Manus people and adopted by Europeans. According to her the Usiai inhabit Admiralty Island. The Manus are a sea-dwelling people. The Matankor are the folk who live on the small islands and build their houses on land, but make some use of canoes. The Manus are the only homogeneous group; the others are composed of various tribes showing great divergence in custom. The Manus, in their "large, single outrigger canoes, which carry two lug sails and a snug little house" control the fishing and the trade of the south coast, and are the middlemen between Usiai and the island Matankor. The two sails and house are innovations. Mbuke people, who are on an island too far from the main island for the other islanders' trade, make pots. The Manus make nothing beyond houses and canoes for their own use, and a few trifles. The Matankor of the north coast, who build good canoes, are traders and excellent fishermen, and have a monopoly of dugong-fishing and excellent turtle-fishing.

The first account I have seen of an Admiralty Island canoe is by Hunter (1793, pp. 240-241) who gives two not very helpful drawings. He says that

". . . five large canoes came off from the nearest island, in each of which were eleven men; six paddled and five stood up in the centre of the boat . . . and seemed intended for war. Their canoes appeared to be from 40 to 50 feet long, were neatly made, and turned up a little at the extremities; there was a stage which lay amidships of the boat, and projected out some distance on one side; it was bent upwards a little at the outer end, to prevent its dipping into the water by the motion of the boat; this stage seemed intended for the warriors to use their weapons upon: on the opposite side, was fitted in a different manner, an out-rigger to balance the boat; three of the rowers sat before and three abaft the stage, so that those intended for battle were not at all incommoded by them."

Hunter's drawings show a canoe with slightly upturned ends, four booms with a stringer close to the attachments, and a broad platform over the hull and extending beyond the other side. There are three seats in the hull in front of the platform and three behind.

Parkinson (1907, fig. 141) copies the illustration given by Labillardière, who was there in 1793; it shows the general character of the paddling and sailing canoes but with insufficient detail.

The following information has been obtained from Moseley (1877, pp. 404, 428, pl. 22), Thilenius (1903, pp. 155-160, figs. 29-33, 102, pl. 11), Parkinson (1907, p. 362, pl. 22), who gives no new information, Friederici (1912, p. 272), and from photographs and models. The descriptions given by Moseley and Thilenius refer to canoes of the northwest and south respectively:

Thilenius (1903, p. 155) says that there is a general uniformity in the canoes of the Admiralty Islands. The small canoes for children are simple dugouts, but the fishing and all

large canoes have an outrigger. The dugout with slightly rounded sides is called *endrol*, which is the name for canoes in general. The fishing and larger canoes are provided with a long, narrow washstrake (*endriu*) which is higher in the center, that is, the region of the booms, than elsewhere. In some canoes there are two washstrakes. According to Thilenius (1903, fig. 29) in the southern region the pointed ends are formed by similar end-pieces, each carved to represent a crocodile's head which continues the horizontal line of the gunwales (1903, fig. 29). A fine example of such an end-piece is shown in figure 100, *a*, and a similar one is illustrated by Vogel (1911, p. 85). Moseley (1877, p. 404), who visited the northwestern corner, says: "The bow and stern are formed of small elongated blocks of wood built on to the ends of the canoe, and level with the horizontal gunwale-piece [washstrake]. They are ornamented with a simple carved ridge or two, and with Ovulum ovum shells." Chinnery's photographs taken at Pitilu, an islet off the northeast coast, show that the laterally compressed end-pieces slant up and are carved to form a flange on each side and an upper ridge (fig. 101), thus the extreme end has a cruciform appearance. The end-pieces are painted with three or four vertical black bands. Photographs from the south region show analogous end-pieces, but without the upper ridge (Parkinson, pl. 22). Friederici says that the Moanus canoes have slightly upturned end-pieces which canoes of Lou Island, to the south, do not have; they are rather torpedo-shaped. Moseley (p. 428) says the hull is painted white, end-pieces and ends of the thwarts and booms are red.

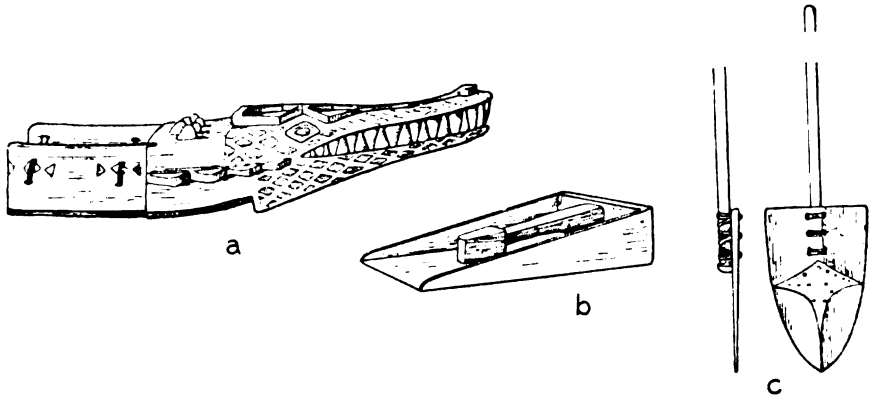

FIGURE 100.—Details of canoes, Admiralty Islands: *a*, end-piece composed of two boards and of a carving of a crocodile's head; *b*, bailer, from Lala; *c*, paddle, from Pak (after Schnee, 1920, vol. 3, pl. 181, figs. 29, 21, 18).

Moseley (p. 428) says that "struts are fitted in at intervals, which prevent the collapsing of the hull, and strengthen it, and specially strong ones are placed beneath the outer booms." His illustration shows that they are shaped like flat-headed dumbbells. Thilenius states that about the middle of the hull are two bowed struts (*monut*) with vertical crescentic ends, one limb of the crescent abuts against the hull and the other against the washstrake (fig. 102). There are three to five thwarts or seats (*bdubrut*) on each side of the platform, with their ends notched below to fit on the upper edge of the strake and above to be kept in place, as are the *navalakeo* and the booms, by a gunwale pole (*pala*); more frequently the seats rest on the edges of the dugout and the lower borders of the washstrakes are notched to correspond.

The long straight booms (*katat*) are usually three to five in number, though Friederici saw one Moanus canoe with six; they are fixed across the hull like the seats. Between each outer boom and its nearest seat is a spar (*navalakeo*) the inboard portion of which is carved like a seat. In sailing canoes the projection on the off side is thick and cuplike, the hollow serving as a step for the mast (fig. 103, *c*); on the outrigger side it projects for about 0.75 meter and has a swollen conical end (fig. 102). In a model in the Sydney Museum each end of these two spars is carved into a human figure. The two ends of these spars are connected by a stringer which runs over the booms. Moseley says that this apparatus is not always present; evidently he refers to small canoes. There is a stringer (*endrada*) across the center of the booms; Moseley says that it is at the fore end of this cross piece that the end of the stay-boom of the mast is shipped. There may be other stringers, especially one which is close to the attachments.

FIGURE 101.—Outrigger canoes (*endrol*), Pitilu, Admiralty Islands (photograph by E. W. P. Chinnery).

According to Moseley, the float is canoe-shaped and made of soft wood (*Hibiscus* or *Thespesia populnea*?). Thilenius says the float (*etjam*) is flat above, rounded below, and with somewhat rounded ends. Each attachment consists of a variable number, usually four or five,

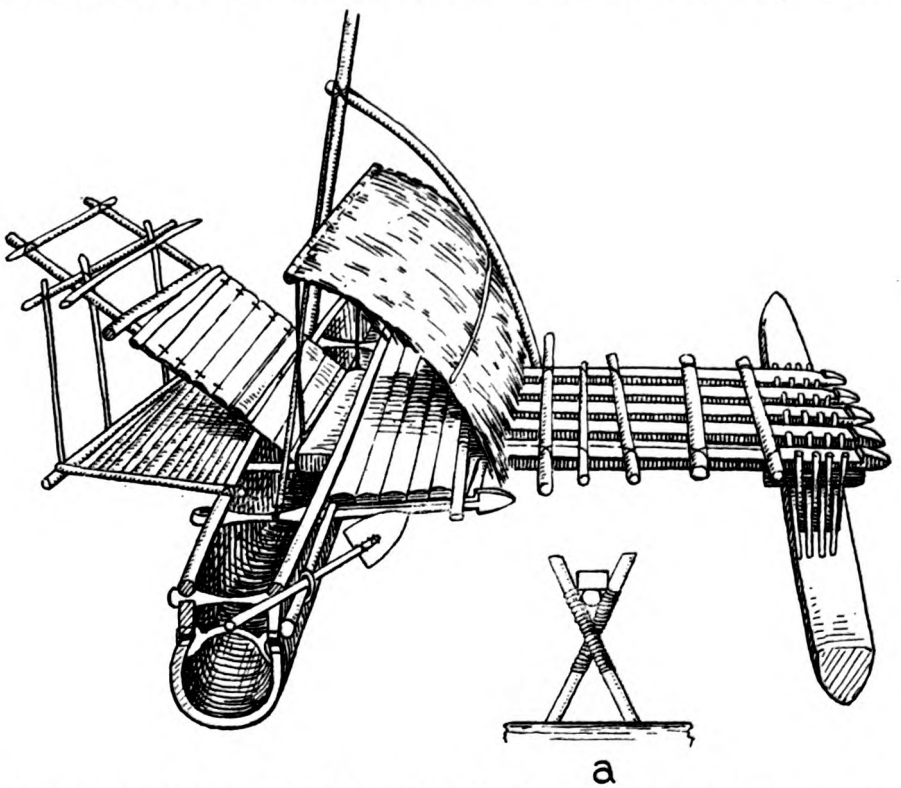

FIGURE 102.—Canoe (*endrol*), Fidap, Admiralty Islands, slightly modified: *a*, attachment (from Thilenius, 1903, pl. 11 and fig. 31).

or even more, of crossed pairs of hardwood sticks (*pulia*) inserted into the float. In the upper angle of the crossings is usually fixed a short thick stick (*latan*) upon which the boom rests (fig. 102, *a*). The whole is securely lashed together.

A platform (*brondjam*) is usually laid over the *navalakeo*; it is composed of boards or poles and sometimes it extends over the booms as far as the central stringer. A shelter (*bal*) may be erected over the *brondjam*; it consists merely of a slanting roof of *atap* supported by sticks (fig. 102).

A thick plank rests on the booms within the cavity of the hull. Two stout spars (*keketjo*) about 1.5 meters long rest against the inner wall of the hull on the outrigger side and pass under this plank to extend well beyond the other side of the hull at an angle of about 45 degrees. There may be a thinner one between them. The *keketjo* are either forked near their free ends or have a piece fastened on each to form a fork in which gear is placed. Planks are fastened across the *keketjo* to form a platform (*patele*). Under this there is frequently a horizontal platform, the framework of which is bound to the gunwale pole on one side and on the other is suspended from the upper transverse stick of the framework of the *patele*. In some photographs it looks as if the lower platform is more solid and supports the slanting one. A shelter and platform are illustrated by Vogel (1911, p. 84).

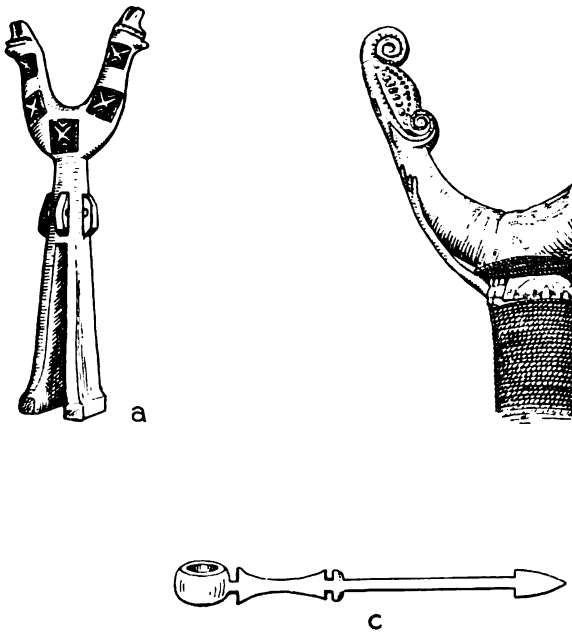

FIGURE 103.—Details of canoes: *a*, fork added to masthead, Taui, Admiralty Islands; *b*, fork inserted in masthead (see fig. 104, *d*), Allison Island, Manus atoll; *c*, *navalako*, cup serving as step for mast, Admiralty Islands (after Thilenius, 1903, figs. 33, 102, 30).

The mast (*badambalei*) is stepped in the hole in the *navalakeo* and propped by a mast-shore (*rasus*) attached to the fore end of the central stringer or to the large platform (fig. 102). In addition it may be steadied by four stays, of which two are attached to the large platform and two to fore and aft thwarts. Moseley says that the mast, which is about half the length of the canoe, is stepped in the bottom of the hull just in front of the large platform. A pole (*rasus*) of about similar length, with a natural fork at the top, is stepped against the foremost end of the central stringer, "and it and the mast being inclined towards one another, the mast is fitted into the fork at the top of the pole, and roused down with a rope-stay so as to remain firm in that position." The end of the mast may be pointed and perforated for the halyard, but in some large canoes a carved fork is dovetailed on to the flattened end of the mast and securely bound on. Thilenius shows one fork piece (fig. 103, *a*) which has four perforated prominences below the fork, evidently for the four stays. The halyard passes over the angle of the fork.

The rectangular mat sail (*laki*) is spread between two spars. The halyard is fastened to about the border of the first and second third of the upper spar or yard and the lower spar or boom fits onto the mast by a forked end. The halyard is fastened to the end of a stringer or to a boom. The sail hangs obliquely. Moseley says: "The yards are of about three-fourths of the length of the mast. The sail is nearly square in form, and is hoisted to the top of the mast, and set so that one corner is uppermost; the opposite corner does not nearly reach down to the canoe." Large canoes have two masts and sails, one behind the other.

Moseley figures an ordinary unornamented paddle of one piece with an oval blade, and a "steering paddle" consisting of a shovel-shaped blade tied on to the shaft. A composite paddle from Pak Island to the east of the main island is shown in figure 100, *c*. Thilenius says the paddles (*ebos*) are clumsy and consist of a pentagonal blade bound on to the shaft. Only the steering paddle is made of one piece with a blade of the usual pointed leaf shape. In rowing (*pal*) the paddles are placed through loops which are tied to the spar (*remba*) which lies outboard on the outrigger side; thus the paddles cannot be used for paddling but are manipulated more like European oars, though not in the same fashion. The rower uses his right hand only to move the paddle through the water until it stands at about a right angle to the boat, he then seizes it quickly with his left hand to bring the blade right forward with a jerk and then carries it slowly to the right hand. Thilenius distinctly states that the rowing is ancient and not due to European influence. True paddling is known and is employed for only quite small canoes.

The bailer (*akanja*) is an oblong, flat scoop with straight vertical sides and back. The handle projects inward from the back and its end may be continued into the bottom of the scoop (fig. 100, *b*).

Moseley says that the large canoes are manned by from 10 to 15 men, and that a large store of spears, the mast, sail, and other equipment are kept on the outer part of the large platform. The natives sit on the inner part when not paddling and stow on it some of their gear, food, and articles for barter, though most of these are kept on the inclined platform, where some of the crew often sit. He adds (1877, p. 405), "As at all Pacific islands, apparently the outrigger platform is the place of honour, and the seat of the head man or chief. Oto, the chief of Wild Island, never occupied any other position, and never touched a paddle."

Moseley gives the measurements of one canoe as 39 feet long, 1 foot 6 inches broad, and 1 foot 4 inches deep in the center. Another was 33 feet long, the solid built-on stern and prow (end-pieces) 2 feet long, and its breadth at the tip 3 inches; breadth of hull 1 foot 1 inch, depth in center 1 foot 9 inches. The sloping platform was inclined to the water at an angle of about 30 degrees; it was 6 feet long and 4 feet wide, that is, in line of junction with the hull. The outrigger apparatus had a length of 10 feet and a breadth of 4 feet 3 inches; float 16 feet long, 5 inches wide in center, 10 inches greatest depth. Friederici (1912) says a large Pak canoe was 12.85 meters long, 0.55 meter wide, and 0.61 meter deep. He says all the Pak (Matankor) canoes seen by him had the float on the starboard side. Of six Mouk (Moanus) canoes four had the outrigger on the port side and two on the starboard; five had five booms and one had four. They carried 64 people in all. One canoe had two masts, and sails.

Edge-Partington (1890, pl. 190) gives a sketch of a canoe model in the British Museum and a sketch of a paddle.

Kaniet Islands

When Thilenius (1903, pp. 218-222) visited the Kaniet (Anachorettes, Anchorite) group in 1898-99, there were only 30 persons on the main island, most of whom were old, there were no children or babies. As there is a shortage of wood suitable for boat-building, the natives go to great trouble in making their canoes out of drift timber, which is often bored by the shipworm. There are two kinds of canoes: those used for fishing (*oai*) and those used for traveling (*muaij*).

The ends of the hull (fig. 104, *b*) slope up and are continued as a horizontal projection (*bubunej*) which is slightly carved and pierced through from side to side and from above downward in the same manner as the ends of the canoelike wooden dishes (*finola*) illustrated by Thilenius (1903, p. 205, fig. 63). Each side of the larger canoes is heightened by washstrakes (*liuen*) tied on with coconut-fiber string. Stretchers (*kauun*) which serve as seats and give greater rigidity to the craft are placed athwart the hull at intervals; their ends rest in notches in the gunwale of the dugout and in the lower border of the strake. At the fore and aft ends are two transverse boards, about 40 cm apart, beneath which are fastened two longitudinal rods which converge at the end of the cavity of the hull; the more central of these boards together with the rods is termed *lauihailan*, in the narrower sense, and, in order to distinguish it, the end board is called *tonain*. This trapezoid framework (*lauihailan*) of two boards and two rods is erected at bow and stern to serve as a support for a man when fishing for bonito (fig. 104, *a*). A gunwale pole (*kokoin*) runs along the whole length of each side, over the boards and booms, and is lashed to the upper edge of the strake or of the dugout when, as in many canoes, there is no strake.

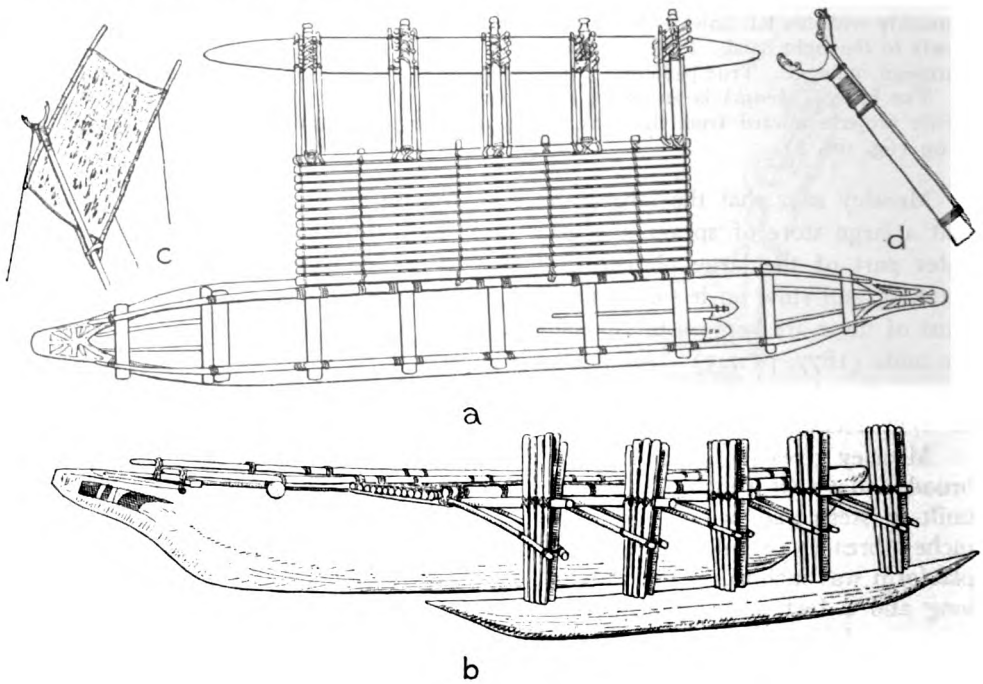

FIGURE 104.—Fishing canoe (*oai*), Kaniet: *a*, plan; *b*, side view; *c*, mast, sail and rigging; *d*, fork at masthead (see fig. 103, *b*), (after Thilenius, 1903, *a*, *b* pl. 20; *c*, *d* pl. 19, figs. 2, 3).

In the middle of the hull are three to five booms (*kuniaoi*) the free ends of which pass between and are lashed to the four pairs of vertical, parallel and close-lying stick connectives (*hararoin*) which are inserted into the float (*tamain*). The float is made of light wood and is about two thirds the length of the hull. Along each side of a boom is a spar (*awujawei*) which is not attached to the hull in the drawing given by Thilenius; its distal half bends down and is lashed to the outer surface of the connectives well below the boom. These two spars thus serve to clamp the outer surfaces of each series of connectives (fig. 104, *b*).

A model in the British Museum has a thick dugout underbody which rakes up rather abruptly; the short pointed ends are not carved or perforated, but there is a depending triangular knob. The upper edge of each strake is notched for the seats and booms over which a gunwale pole is lashed. The two longitudinal poles of the trapezoid framework are inserted into the two transverse boards. There are four flattened square booms with a thin *awujawei* (spar) on each side, which, like the boom, extends just beyond the off side of the hull. A platform of flat longitudinal laths extends across all the booms; there is a pole at each side and over the ends of the laths. Beneath the platform to which the laths are tied and midway

between the booms is a transverse pole, making three in all. There is a long broad float slightly raked at the somewhat square ends; on the more or less flat upper surface are four pairs of vertical sticks for each boom. The *aɛujaɛei* begin to bend down at the end of the platform and are lashed to the outer sides of the connectives below the boom.

A model in the Oxford Museum has horizontally projecting ends, carved and perforated in the typical manner. The three booms lie on the edges of the dugout and under the gunwale pole on each side. There is a single *aɛujaɛei* for each boom which is attached in the same manner, it is bent down distally and passes under the crossings of the connectives which are three pairs of long sticks that cross under the boom and extend high above it. A looped lashing, served in its middle, connects the float with the end of each boom.

A small model in the Köln Museum shows much the same structure. The four booms rest on the crossings of the four pairs of undercrossed sticks. A single *aɛujaɛei* is lashed under each boom and does not extend across the hull, its distal end passes below the crossings and its end is connected with the end of the boom by a served lashing.

Thilenius (1903, p. 220) says that the canoe as he describes it is the typical form for Kaniet and adds that it does not occur in its purity today (thirty years ago). We may probably regard the crossing of the connectives as an innovation, and their vertical parallel arrangement as primitive. It looks as if the new method had been copied from the Hermit Islanders.

A platform (*uahej*) of longitudinal poles set close together extends in many canoes from the hull to about halfway across the booms. Stores are carried on the platform since there is little room within the hull.

The mast is stepped in the bottom of the canoe and is held in position between the gunwale pole and the side of the dugout by two stay ropes which pass from the masthead to the fore and aft booms (fig. 104, *c*). A decorative wooden fork is added to the end of the mast and is further secured by a lath that is lashed to it as well as to the mast for some distance downward (fig. 104, *d*)[4]. The quadrangular mat sail is fastened to two spars. The lower spar has a fork at its lower end which rests on the mast. At about one third of the length of the upper spar a rope is tied which passes over the fork of the mast, and by this rope the sail is hoisted. Other light ropes serve for the further setting of the sail.

The paddle (*faha*) has a simple shaft which is bound on to the blade, which is triangular with two convex sides and an upper concave end.

Thilenius saw only one bailer (*kalop*); it was shaped like a trowel, the handle of which projected forward and bent downward at a right angle and was continuous with the bottom.

Hermit Islands

Parkinson (1907, p. 434) calls this small group Luf, after the largest island, and says that the name Agomes is not native, but is due to a perversion by the islanders, of the word Hermit (Eremit of the Germans). The group includes the double island of Maron and Akib and the small island Djalun.

The smaller canoes of this group are dugouts, but as sufficiently large trees are not always obtainable their edges have occasionally to be heightened by sewn-on planks (*nee*), and then end-pieces may be added. The dugouts have rounded sides which tumble home so that in section they form three quarters of a circle. The gunwales of the hull form two horizontal parallel lines. In the bow and stern of fishing canoes there is a framework of sticks which enables a man to stand firm when fishing with hooks, as in Kaniet canoes. A description of the larger traveling canoes is given and illustrated by Thilenius (1903, pp. 190-194,

[4] This specimen (fig. 104, *d*) came from Manus (Allison Island), which lies between Ninigo and Aua (Durour Island). About 1870, a canoe from Kaniet bound for Ninigo went astray and fetched up at Manus, where the crew settled as the atoll was then uninhabited (Thilenius, 1903, p. 113).

figs. 53, 54; pl. 15), and I should like to take this opportunity of thanking him for his kindness in allowing me to copy his illustrations.

These canoes may be as high as a man. The dugout (*uche*) is not much more than a high keel; its sides are hewn and on account of the many rows of carvel-built, straight planks the hull has, instead of a round section, an angular one of trapezoid form. The dugout rakes up at each end and the curve is continued by an end-piece (*bubun*) which is produced as a small curved spur with a square end (fig. 105), the wings of the end-pieces abut against the strakes. The various parts are sewn together. Across the topstrakes lie the seats (*nbut*); these and the booms are kept in place by an overlying gunwale pole (*darei*) which is lashed at intervals to the topstrake. Attached to the *darei* are liana slings in which the oar-paddles are put in European fashion; the smaller canoes are paddled in the usual manner.

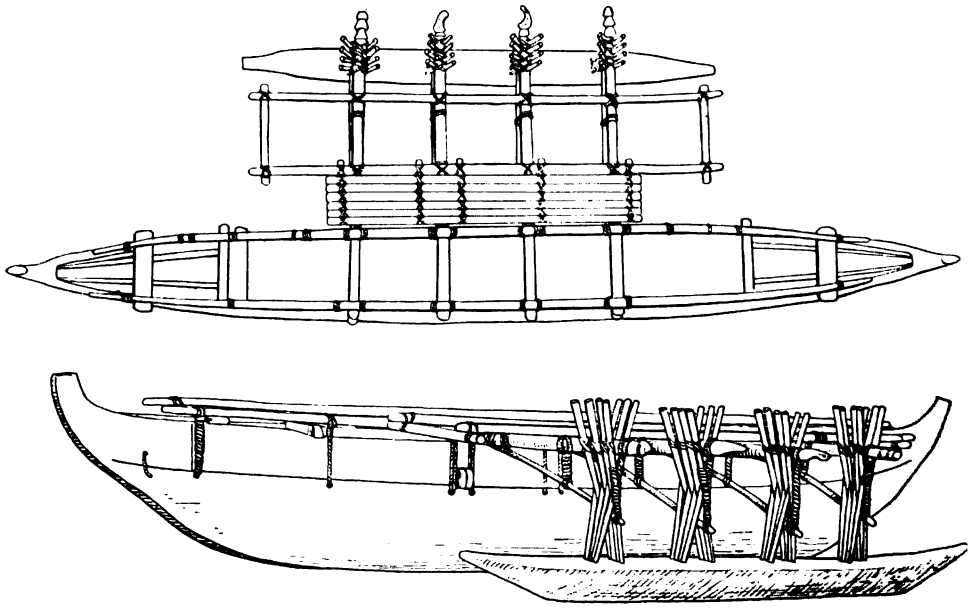

FIGURE 105.—Fishing canoe (*uche*), Hermit Islands, plan and side view (after Thilenius, 1903, pl. 15).

The four, sometimes three, booms (*iet*) are amidships; the two outer ones project on the off side, and are kept in position by being lashed to a longitudinal pole (*kai*) which is omitted in the drawing. The inner booms in many canoes reach only to the inner surface of the off side of the hull. The float (*sjam*) rakes up fore and aft to a square end, and it has a broad, flat upper surface. In a canoe about 9 meters long the float is about 4 meters long and is about 2 meters distant from the hull.

Each attachment for the outer booms consists of four or more pairs (often only three for the middle ones) of long, thin stick connectives (*kiawei*) about 50 cm long and often tied together at intervals, their sharpened lower ends are inserted into the float. The pairs cross each other and the boom is lashed above their crossings. A spar (*bulen*) underlies and is lashed to each boom for half its length; it then bends down and here is secured to the boom by a vertical served lashing; it finally passes under the crossings of the connectives and its end is secured to the end of the boom by a long vertical served lashing.

On the booms close to the hull lies a strong, narrow platform (*bebad*) of close-lying canes or sticks. On the outer side of the platform is a quadrangular frame (*wa*) composed of two stringers which project fore and aft beyond the booms, with a cross piece at each end; this serves to strengthen the booms and on it sticks may be tied to extend the platform. For long voyages, or to carry a crew, a large, firm platform (*balawa*) is laid over the length of the booms. Thilenius refers to a structure on the booms which is erected on traveling canoes

immediately between the two middle attachments. The upper parts of the converging sticks of these two attachments are cut short and a kind of open box of plaitwork, or sticks, or with two boarded sides, is made to serve as a receptacle for tackle, and so forth. A somewhat different arrangement will be noted later.

The mast (*bebarei*) stands in a sling, outboard in an angle between the side of the hull and a boom; it is supported by four stays. A carved wooden fork, over which the sail is hauled, is usually tied on to the end of the mast. The oblong mat sail (*barce*) is fastened between two spars, the end of the lower of which is provided with jaws that embrace the mast. The position of the unfurled sails is as in Kaniet and Admiralty Islands. When there are two masts the arrangement of the sails is practically the same. If the sails are not in use they are rolled up and laid on the booms.

A carefully made model in the Oxford Museum agrees in many respects with the foregoing description:

The dugout rakes up at each end where a large end-piece is sewn on; to its square-ended spur is added a curved piece or prow affix. Each end of the canoe slopes upward and slightly outward and finally bends inboard with a bold curve. A broad washstrake is sewn on to each edge of the dugout and so cut as to fit on to a wing of the end-piece. Above the washstrake is a gunwale pole which passes over the booms and seats and holds them in position. A low vertical fringe is fastened to each end of the gunwale poles, perhaps to keep out spray, and between this and the platform are four vertical loops which possibly represent the rowlock loops of the craft of the Admiralties. The outside of the hull is painted with simple designs in red, and the end-pieces are more or less red with a border of black and white squares.

There are four booms of which the two central are the longer and extend over the broad float. The booms are overlaid by a continuous broad platform of longitudinal laths, over the ends of which are tied transverse poles. A small board platform extends from it between the two middle booms and over the float. Under the booms is a stout longitudinal pole below the outer edge of the platform and another a short distance from the hull. Below and lashed to these longitudinal poles and underneath each outer boom is a transverse pole, and there are two central transverse poles by the side of the central booms. These four poles stop short at the connectives.

The attachments consist of four pairs of undercrossed long sticks, but the inwardly projecting portions of the two central attachments are cut short to a level with the booms so as not to interfere with the small board platform, on the fore, aft, and outer sides of which are erected vertical boards, thus forming a receptacle open above and toward the hull. A palm-leaf covering is wrapped around the upper portion of the outer attachments to form a fore and an aft funnel-shaped basket with a circular mouth strengthened by a stiff ring. The float is broad, thick, and flat above; the lower border slopes upward from the center to the flat square ends.

The platform on the off side consists of transverse laths on the ends of which are binding laths, and there is an outside binding pole. It is supported by three poles which lie on the off gunwale pole and pass below the opposite gunwale pole and end under the first lath of the outrigger platform.

In other models the dugout ends in a blunt horizontal point. There is no washstrake, but there is a gunwale pole. The platform box has four sides but it is open above. A model in the British Museum has a *bulen* spar as in figure 105, for the outer booms only. There is a stick with a fringe inserted into the float and tied to the ends of the outer booms instead of the served lashing. The booms have five pairs of stick connectives, the two inner booms have only two or three.

The largest sailing canoes of the group are the most impressive craft of this region. Parkinson (1907, pls. 30, 31) gives beautiful photographs of a fine specimen which is the last of its kind (fig. 106). This vessel, which is now in the Berlin Museum, is that referred to by Thilenius (1903, p. 192) and seen by him in a boathouse at Luf.

The foundation is an enormous dugout with its sides raised by several rows of planks and raised above the topstrake is a gunwale pole like that just described. Each end-piece is prolonged as a massive, inboard curving, vertical projection

(Parkinson, 1907, p. 445, fig. 75) which is carved with quadrangular patterns and is painted; the outer border is decorated with tassels of coconut fiber and knotted strings, and two large bunches of feathers hang from the curved end. A drawing of another projection is given by Thilenius (1903, pl. 13, fig. 7). The whole outer surface of the boat is painted with regular designs in red-brown and white.

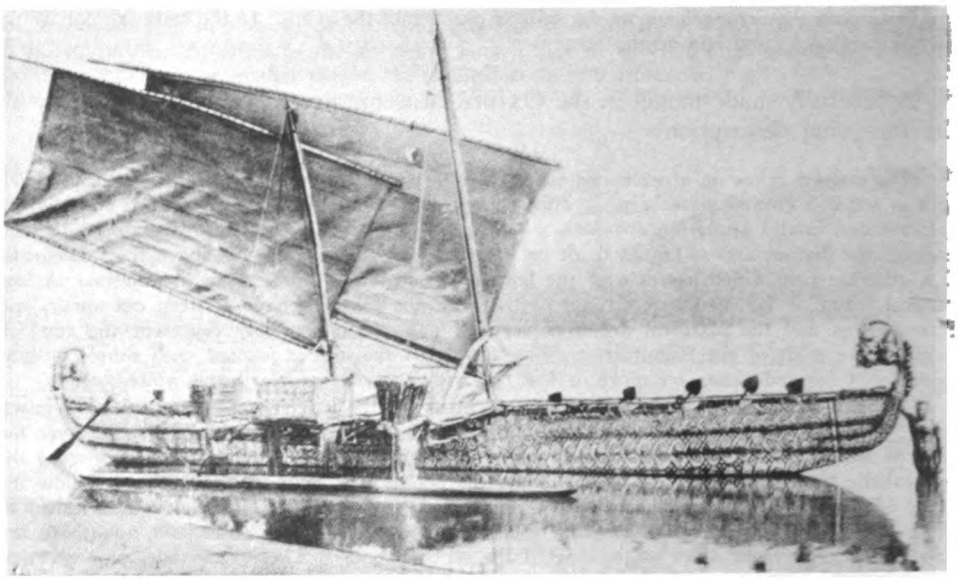

FIGURE 106.—Large sailing canoe, Hermit Islands (from Parkinson, 1907, pl. 30).

The outrigger apparatus is massive, with four strong booms, each with a curved under spar (*bulen*). There is a continuous platform with a stringer close to the attachments. Some distance below each outer boom is a spar parallel to it and connected with it by a vertical served lashing; the free end of each is lashed to a longitudinal spar which probably is also lashed to the curved spars under the booms; there is another longitudinal spar between this and the hull. The two outer attachments consist of nine and the inner of six pairs of very long stick connectives which rise high above the booms, and there is a vertical connective in front of each set which appears to go up to the boom. A similar additional vertical stick occurs in some models, for instance those at Oxford and Köln. On the outer side of each of the outer attachments there are two stout oblique pegs driven into the float. A strong cord passes from the outer peg to the attachment of the outer stringer to the boom and one from the inner peg to the end of the boom; the upper inverted triangle thus formed is filled in with a rectangular meshwork. This is doubtless a subsidiary contrivance to strengthen the outer attachments. A square crate is formed above the end of each outer boom, the upper ends of the connectives of its attachment forming two of its sides. Over the ends of the middle booms is a large oblong boarded box, the sides of which are painted with the same design as the hull. The diverging upper ends of the connectives persist at the fore and aft ends of the box; the converging ones have been cut down. In a model in the Köln Museum there is an oblong, flat-roofed deckhouse in the same position. On the other side of the hull is a simple slanting platform, similar to that in the Oxford model.

Each of the two masts is supported by a slightly curved, slanting mast-shore which is fastened below to an outer boom of the outrigger and above a short distance up the mast, where it is secured by guy ropes, the other ends of which are tied to a thwart. Each mast has a slender point at the end and is steadied by two stays. The sails are oblong and when unfurled are horizontal or set at a low angle to the masts. The halyard is fastened to the yard at about one third of its length, and a vang is fastened near the outer end of the yard. The boom has jaws which work on the mast well below the mast-shore. There are two sheets

which are fastened close to each other at about the center of the boom and a third one near the free end of the boom. The steering paddle has a long narrow blade and the other paddles have heart-shaped blades.

Parkinson (1907) says the ship would hold 50 persons and he adds that one can not doubt its seaworthiness. Weule (1912, pl. 67, fig. 2) gives a photograph of the off side of this vessel.

There are models of canoes in various museums, some of which do not appear to be quite correct in every respect and the same applies to a few illustrations in books. The foregoing description may be taken to apply to the normal construction of typical forms of the craft of the Hermit Islands.

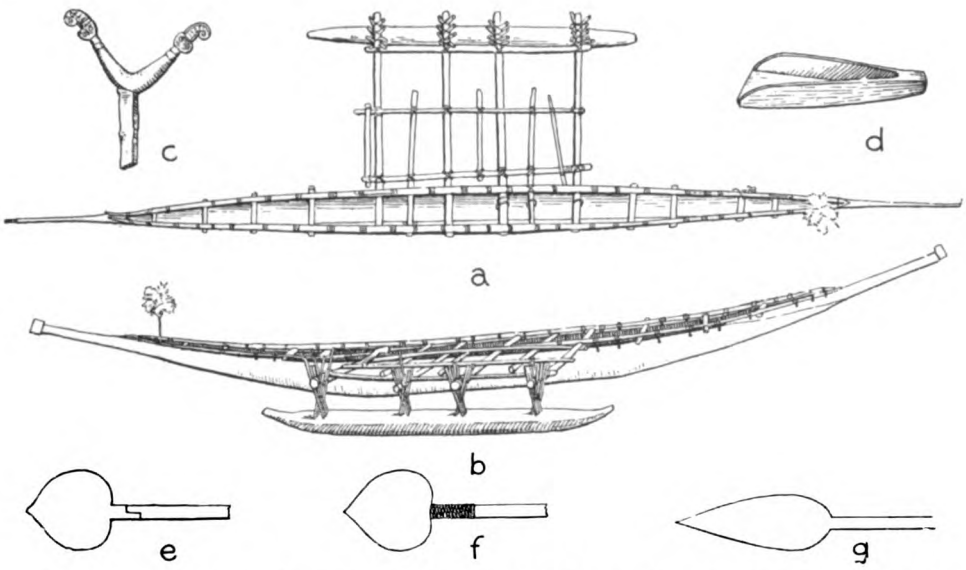

FIGURE 107.—Decorated canoe (*wa*), Ninigo Islands: *a*, plan; *b*, side view; *c*, fork (inserted into mast); *d*, wooden bailer; *e*, blade of paddle, showing construction; *f*, paddle ready for use; *g*, blade of steering paddle (after Thilenius, 1903, pls. 25 and 24, figs. 2, 4-6).

NINIGO ISLANDS

Bougainville who discovered the Ninigo Islands in 1768 named them L'Echiquier from a fancied resemblance to a chessboard.

The following description is based on Thilenius (1903, pp. 253, 254, pls. 24, 25), Parkinson (1907, p. 445), and notes by Chinnery. The second names are those given by Chinnery:

The slender, elegant, and decorated canoes (*wa*) of the Ninigo Islands have a character of their own (fig. 107). As at Kaniet, the hull (*wa*) is made of driftwood, owing to the absence of suitable forest trees, but it has not the rounded form that corresponds to the curvature of the tree trunk which is found in canoes of other islands. The bottom of the canoe is flat and the sides straight. The central part of the bottom is horizontal and the long ends sheer up in an acute angle and terminate in a squared block that is slightly larger than the diameter of the extreme ends. These elongated ends are formed largely by end-pieces (*uliwa*) neatly fitted on. There is no washstrake (though Chinnery gives *tiu* for "washstrake on hull"), but there is a gunwale pole (*tisan, tissan*), which lies above the booms and the numerous thwarts (*toton*) and extends over part of the end-pieces. The thwarts serve as seats and to strengthen the body. The outside is painted in vertical broad white stripes of unequal sizes

(Thilenius 1903). Chinnery's photographs show interrupted black vertical bands and other simple designs; the decoration is called *munikaian-au*. The Köln model has mainly the same sort of pattern as that characteristic of the Hermit Islands canoes.

There are usually four, sometimes six, straight booms (*iad, ias*) in the center of the canoe. The float (*cham, kham*) is rather short; it has raked ends and a flat upper surface in which the attachment sticks (*huka, hunka*) are inserted. Each attachment consists of four, rarely six, pairs of crossed sticks in the upper angle of which the boom is fastened. In a canoe about 15 paces long, the booms were 6 paces, and the platform framework 3 paces long.

A stringer crosses the booms close to the attachments, and another crosses at about their middle. According to Thilenius there may be a framework over the booms which consists of two longitudinal stringers (*pach, baka*), strengthened by transverse spars parallel with the booms, two of which in Thilenius' drawing cross over the hull and are attached in the same way as the booms (fig. 107, *a*). This framework may bear a small platform (*pacha*) of close-lying round sticks. In the Köln model there is a continuous flat platform. On the opposite side of the hull a larger, removable platform (*sucha, sosa*) may be erected.

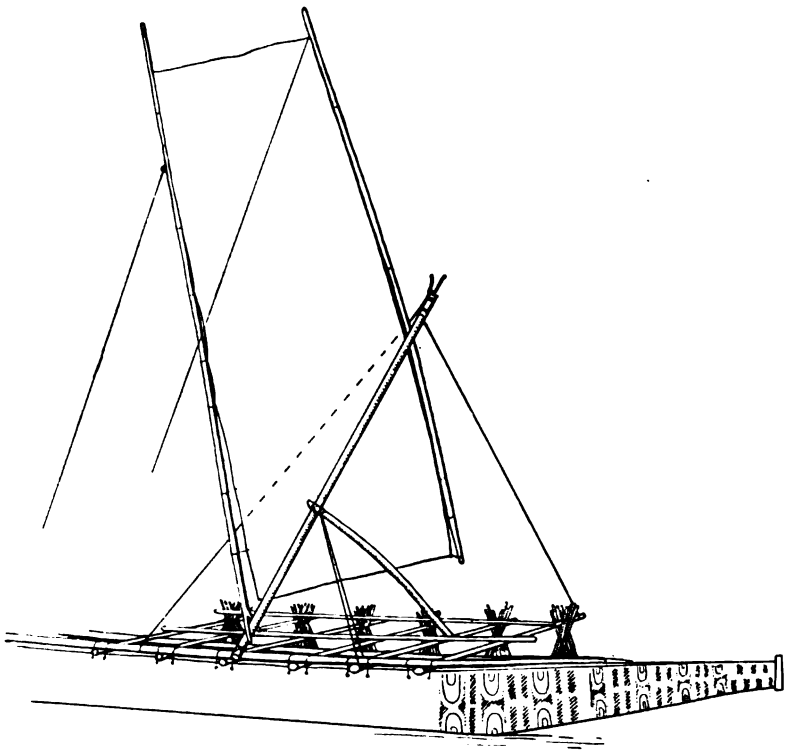

FIGURE 108.—Sailing canoe (*wa*), Ninigo Islands (after photograph and sketch by E. W. P. Chinnery).

The short mast (*halian, haliam*) is, according to Thilenius, stepped outboard in a rope sling (*tal*) and is held by two stays (*tali kham*) that pass from its end to the booms. Chinnery's photograph shows one stay only. A fork (*pisen*), often carved and with curled ends, is added to the end of the mast (fig. 107, *c*). The mast is further supported about its center by a mast-shore (*kauchu*) which is fixed on to a boom (fig. 108). The nearly vertical sail (*li*) is a long oblong pandanus-leaf mat fastened between two vertical spars (*sil*); the boom has a forked foot that rests on the base of the mast. Chinnery calls the boom *sin pu*, the yard *sin patul*, and the ropes that fasten near their upper ends are respectively *tali pu* (the sheet) and *tali patul* (the vang). The halyard is called *tahhato*. A model in the Köln Museum has two masts with quadrangular sails.

The steering paddle (*kabit*) has a long blade shaped like a spear point and is made of one piece (fig. 107, *g*). The oar (*cho*), which is sometimes used as a paddle (*papau*), has a

heart-shaped blade (*anon*); it is rabbeted to the shaft with the joining securely bound over (fig. 107, *e, f*). Chinnery gives *khok* for paddle. A wooden bailer (*kalo*) of peculiar form is shown in figure 107, *d*.

Maty Islands (Wuvulu and Aua)

Maty or Matty Island was discovered by Carteret on September 19, 1767, and named for his friend Dr. Maty. In 1817 Captain Bristow called it Tiger Island. It is known officially as Wuvulu, its native name. Thilenius (1903) calls it Popolo; Aua he terms Hunt Island, but Carteret called it Durour.

A short history of the peoples of Wuvulu and Aua is given by Pitt-Rivers (1925, p. 425). He describes them as being of "proto-Malayo-Polynesian stock" and quotes Parkinson's description of them (1907, p. 417):

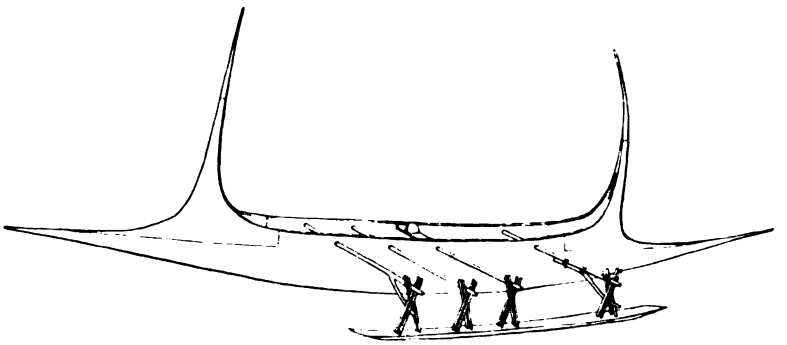

Figure 109.—Canoe (*wa*) of Aua Island (after photographs by E. W. P. Chinnery).

Their color is light brown like that of the Samoans; the hair is straight, wavy, or curly, and they have pleasant and often regularly formed features, with an oblique setting of the eyes. The chiefs are patrilineal but the commoners are all matrilineal and matrilocal. Pitt-Rivers states that the language is allied to the Polynesian root language and that many words are variants of Samoan words. Parkinson says they must have migrated from Indonesia and though only 87 sea miles from New Guinea they have nothing in common with the Papuans.

Chinnery (1927, no. 1, p. 52) gives a few notes on the people.

The canoes of the two islands are similar as Carteret noted. They are beautifully constructed and differ in form from any craft found elsewhere. Von Luschan (1899, p. 127) gives drawings, made to scale, of a Wuvulu canoe in the Berlin Museum and a photograph of one at sea. The photographs given by Parkinson (1907, pp. 419, 427) do not show details. Hambruch (1908) describes and illustrates the structure and gear of the canoes of both islands. Pitt-Rivers (1925, pl. 33, and Illustrated London News, April 6, 1929) gives excellent photographs of shark-fishing from small canoes at Aua. The canoe terms in the ensuing description are given by Parkinson (1907), Pitt-Rivers (1925), Hambruch (1908), Friederici (1912), and Chinnery (MS.). I have used each author's initials to indicate the term specified by him.

The canoe (*wa*) is a narrow dugout made from the breadfruit tree; the bow and stern are prolonged into a very long thin point (*umuna*, H) (fig. 109). There is no washstrake, but end-pieces (*aluhne*, H; *aluna*, P-R) are countersunk and pegged into the hull so as to not break its lines. One end of the lower part of each end-piece is bifid to correspond with the cavity of the hull, and the other is produced to a sharp point which rests on the upper surface of the pointed end of the hull; at about its middle it rises up vertically to form a longer or shorter elegant spur (*na una*, P; *noune*, H) with a truncate end; on to this is usually affixed an added piece which is often very thin and sharp. When many canoes are close together these points

may be taken off and laid in the canoes to prevent their being broken (Parkinson, 1907, p. 422). The point may be decorated with a tuft of human hair, according to Parkinson.

The size ranges from canoes 3.5 meters long, which can carry only one man, to those about 18 meters long which hold 20 men. According to Parkinson there were at Aua in 1899 a number of very large canoes, probably for occasional voyages to Wuvulu, but on Wuvulu medium-sized and small canoes predominated. Every observer states that the canoes are handled with great skill.

The section of the hull is V-shaped, the keel being thicker than the sides. The longer the canoe the thicker and higher the sides. According to Hambruch, the inboard uppermost part of the freeboard (*rovahana*) is recessed so that its thickness is reduced by about one half; this is evidently to reduce the weight in the large canoes.

The float (*tamane*, P; *taman*, F) is short and flat, and is slightly raked at both ends which are usually square. In the smaller canoes there are four straight short booms (*iatona*, C; *aton*, F; *atone*, H) which pass through from one side of the hull to the other; according to Hambruch each is made fast by a treenail driven through the upper edge of both gunwales. Typically the fore boom is at a greater distance from the second boom than the three others are from each other. The two outer booms, and sometimes the two inner booms as well, have a forked ending, either a natural branch or more often a bent stick which is lashed to the boom. The canoe figured by Von Luschan (1899, p. 127) has three unforked, evenly spaced booms, and there is a stringer under the booms near the attachments; his photograph (1899, p. 128) also shows three evenly spaced booms, but the two outer ones are forked. One photograph in my possession shows five booms, all of which are forked. Apparently in the larger canoes there may be eight or more booms which probably are evenly spaced.

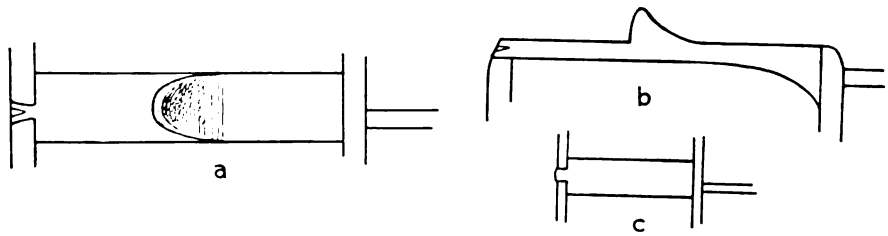

FIGURE 110.—Details of canoe seat, Aua Island: *a*, plan; *b*, elevation [sketches by E. S. Thomas of an Aua canoe (*wa*) collected by Capt. G. Pitt-Rivers]; *c*, flat seat of a model canoe (both in the Oxford Museum).

In the small canoes used for shark-fishing the inboard portion of the central boom (the first of those close together) is broad so as to form a seat (*lione*, H); its off end is cut into a dovetail tenon which fits into a mortice in the gunwale of the hull and may be expanded by an inserted wedge (fig. 110, *a*); its upper surface is flush with the top of the gunwale. The boom itself passes through a hole in the hull in the usual manner. The upper surface of the seat is raised to form a central transverse spur or ridge, which is often slightly nearer to the off side (fig. 110, *a*, *b*). This has not been described previously. Pitt-Rivers informs me that when these small canoes are raced, as is frequently done, the canoe is canted over as far as possible and there is considerable danger of the float leaving the water with the consequent capsizing of the canoe. The ridge on the seat prevents the occupant from sliding to the off side and thereby increasing this danger; the same danger occurs during shark-fishing. In a model canoe in the Oxford Museum (fig. 110, *c*) the seat is flat.

Von Luschan figures a stick thwart near each end of the canoe. Pitt-Rivers informs me that in the larger canoes at Aua there is a board thwart at each end on which two men stand, one with a torch and the other with a landing net, when fishing at night for flying fish and gar fish; there are some half dozen paddlers.

Photographs by Chinnery show for each attachment two, or rarely three, pairs of undercrossed sticks which may extend well above the booms but which are usually cut off close above them. The fork or the stick added to the boom passes below the crossings. Other photographs, including those taken by Pitt-Rivers, show a similar arrangement. Sometimes a stick of the fore attachment is prolonged well above the others, or an erect branched bough may be tied to this attachment. Hambruch names the attachments *tamane* and the float *ahone*; probably these terms should be reversed.

The lashing of the connectives to the main part of the boom is often particularly strong. This is necessary to withstand the strain of the arduous work of catching sharks by a single man in a small canoe.

Hambruch says that occasionally stability is increased by two canoes being lashed together on their off sides and so a kind of temporary double canoe with outriggers is formed. Two canoes may be connected by overlying planks on which mats are laid and a small hut erected as a shelter for the crew.

The canoes and their parts are preserved by constant lime-washing (*waroba*, H). There is no calking. The paddles (*pore*) have an elongated pentagonal blade running to a point; they are often made in one piece, but sometimes the shaft and blade are bound together so cleverly that the joining is scarcely to be seen. Hambruch figures a steering paddle (*waboa*) which is of one piece and the blade is longer than in the ordinary paddle (*bore*). The wooden bailer (*azu*, P; *atu*, F; *ati*, H) is a scoop with an inward projection for a handle, but Hambruch illustrates (pl. 17) a bailer with an outside handle, as is sometimes seen at Santa Cruz. Sails are not used in these islands.

Besides the large and small canoes, the natives make models which differ from the original merely in size, but the play canoes are fitted with numerous booms. Hambruch figures one with ten booms with a thin stringer across them; there are no seats and there is a stick thwart at each end. The single pair of connectives goes through a hole in the swollen end of each boom. A model in the Köln Museum has eight simple booms and the attachment consists of two sticks that cross within a hole at the swollen end of each boom and extend slightly above it; the end booms have three sticks. Another model has four simple booms disposed in the typical manner with three more or less vertical sticks which pass through a hole at the end of each boom. The fore boom of one model has one pair of undercrossed sticks and a pair of vertical parallel sticks. In a model in the Leiden Museum there are twelve simple booms, each attachment consisting of two convergent sticks which enter a hole in the boom. The perforated boom is a weak device and occurs only in a few models or play canoes.

CAPE YORK PENINSULA, QUEENSLAND

The craft of Australia consist of rafts, bark canoes, simple dugouts, and dugouts with a single or a double outrigger. Smyth (1878, pp. 407-422) gives a full account of the bark canoes of Victoria and alludes to other Australian types. The different types of craft have been dealt with in an exhaustive manner by Thomas (1905, 1906) from the information then available. Subsequently Roth (1908) gave a short account of the North Queensland craft and later (1910) a more complete and well-illustrated description. As this important record of original investigation is not easily accessible, I have taken from it all the information concerning the outrigger canoes. In a letter Roth informs me that the bark canoe of his plate 4 (1910) is from Tully River (east coast) and not from the Gulf of Carpentaria, and the outrigger canoe of plate 6, 1 (1910) is from Claremont (east coast) not Batavia River. In 1913 I summarized our knowledge of the outrigger canoes of North Queensland and indicated comparisons with analogous craft elsewhere. Radcliffe-Brown (1916) gives an account of the distribution of the various forms of rafts in Western Australia. Davidson (1935) discusses the chronology of Australian water craft.

Water craft, other than outrigger canoes, are described for particular regions by Spencer and Gillen, Basedow, and other investigators. It is outside my present purpose to give a description of all the craft of Australia and so I shall confine myself to the canoes with outriggers. Those with double outriggers are found on the west coast of North Queensland, probably from about 14° S. northwards. On the east coast they extend, perhaps intermittently, from Cape York to about 14° S.; but here and there they have been noted farther south. Macgillivray (1852, vol. 2, p. 15) "found a small canoe with two outriggers concealed on shore among some bushes" at Fitzroy Island, near Cape Grafton, about 500 miles south of Cape York; this is near the southern limit of the next type. Unfortunately the

technique of attachment is not known. Canoes with a single outrigger extend from about 14° S. to about 18° 40′ S.

It is convenient to begin a survey of the outrigger canoes from south to north on the west coast of the Cape York Peninsula (fig. 111) and thence round Cape York and southward down the east coast.

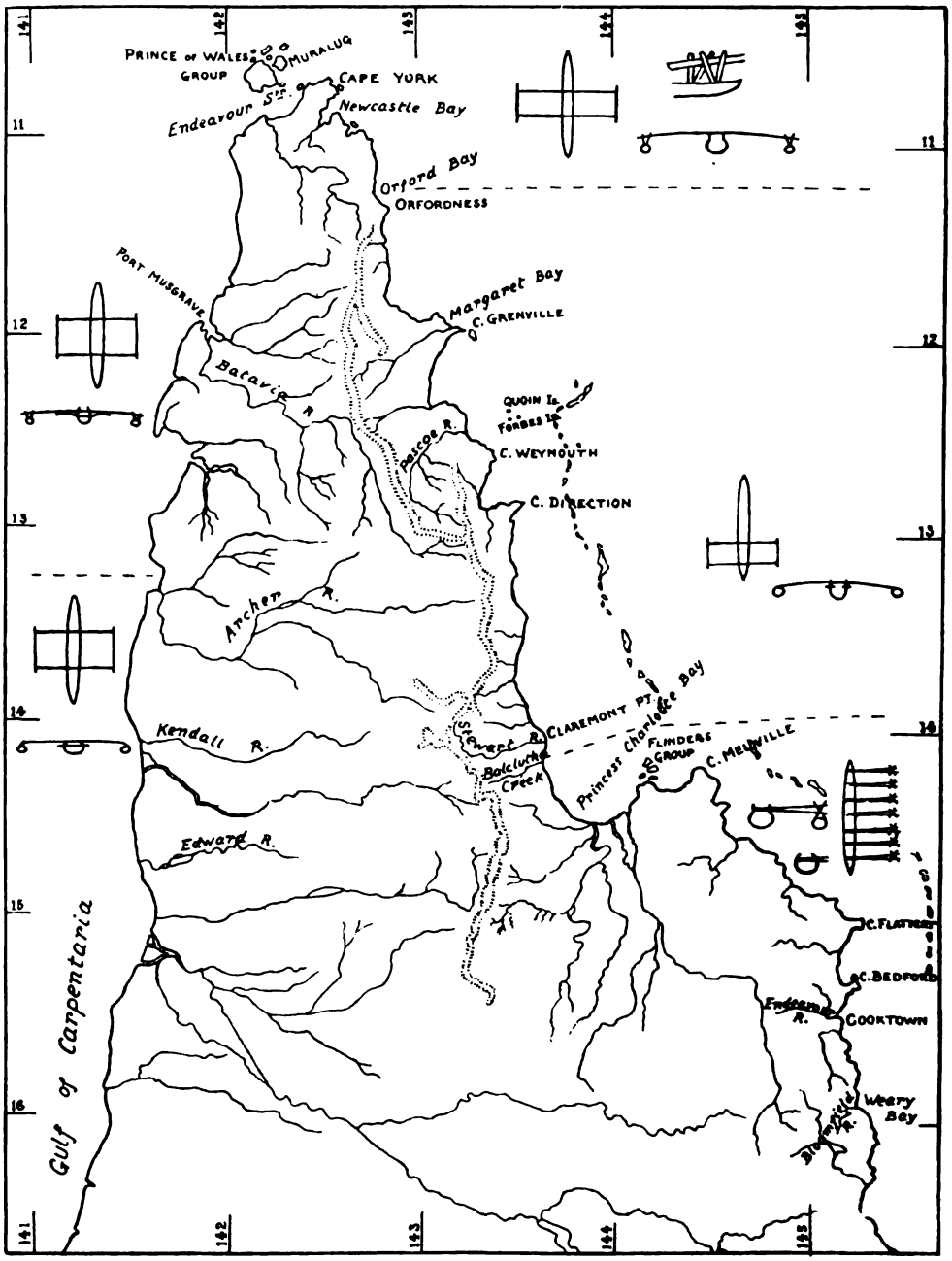

FIGURE 111.—Sketch map of Cape York Peninsula, Queensland (after D. F. Thomson), showing the distribution of various types of outrigger canoes.

DOUBLE-OUTRIGGER CANOES
Archer River Type

McConnel (1930, p. 104), in her study of the Wik-Munkan tribe of the Cape York Peninsula, says: "Men harpoon sea-turtle and dugong from double-outrigger dug-out canoes, and fish from bark canoes in the mouth of the rivers." As this was a new record, I wrote to Miss McConnel and she kindly sent me a few photographs and gave me some additional information:

The Wik-Munkan occupy the coast and hinterland of the Gulf of Carpentaria from Edward River to Archer River. Miss McConnel says these canoes are still made on the Archer River, but she did not see one farther south than the Tokali River. [I suppose they are or were common to the whole tribal area.]

These canoes with double outriggers, according to McConnel, resemble the photograph by Roth (1910, pl. 6, fig. 1) of a Claremont canoe (east coast) and his figure 11. The Archer River canoe (fig. 112), however, is smaller and has no projection upon which to stand. The booms pass over the gunwales and are placed symmetrically with regard to the center of the hull, and not near the aft end as in figure 113, *d* (Claremont type). Below each boom is a stick that passes through holes in both sides of the hull and projects beyond it; to this the boom is lashed outside and inside the hull (fig. 112). The lashing of the booms to the float is made from the green bark of certain trees and shrubs, chiefly from a kind of wattle (*mo'a*). A photograph by McConnel shows that the booms are not single poles but are composed of two poles bound together over the hull, but she thinks this is not usually the case. The two booms are far apart and are lashed to the ends of the float, which is a simple thin pole. Miss McConnel did not see any canoes with a stick attachment of the float to the booms, as in the Batavia River type.

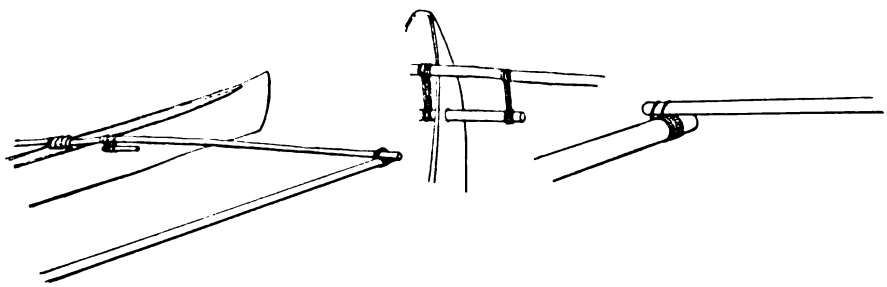

Figure 112.—Details of the Archer River type canoe, Cape York Peninsula, Queensland (from photographs by Miss U. H. McConnel).

In a letter dated March 5, 1932, Mr. Mackenzie, referring to my statement that I could not see any attachment sticks in Miss McConnel's photograph, says:

"This is true, degeneration has taken place, but here there is always one peg or stick to which the boom is lashed, the lashing going right round the boom and float, the peg being merely to keep the lashing from slipping over the end. Usually a nail takes the place of the peg, hence you would not be able to distinguish it in the photograph. I think the attachment is simply a local form as these people did not have any communication with the Claremont people. The Archer River type of canoe extends from about 13 to about 14 degrees south latitude. In the Archer type the stern is not flattened to form a seat for the steersman but is hollowed right out, the steersman using a bit of wood or board as a seat."

The direct attachment may be an indigenous local type, or it may be due to degeneration. Exactly the same problem occurs on the opposite side of the peninsula; an overland migration seems improbable. Miss McConnel was told that there were no dugout canoes on the Embley and Archer Rivers before the Mission was established at Mapoon, Batavia River, and also that the Archer type is a deteriorated and lazy way of making a canoe which was not needed to take sea voyages (personal communication).

Batavia River Type

Roth (1908, pl. L, fig. 4; 1910, pp. 11-12, fig. 10) describes the type of canoe (fig. 113, *c*) found on the Batavia River, which flows into the Gulf of Carpentaria at about 12 degrees south latitude:

> "The outer side of the body of the dugout is but little worked, except of course at the ends, where there is a projecting ledge beyond the excavated part; that at the bows forms a sort of platform" on which the hunter stands when on the lookout for turtle, etc.; "that at the stern forms a kind of lip, with the result that the line of keel makes a somewhat graceful angle with the former, but an almost abrupt ending with the latter. . . . The butt-end of the tree-trunk ultimately forms the bows, which accordingly ride wider and higher when floated. The greatest breadth in the bilge is not very markedly larger than the space between the gunwales; the sides tumble in but slightly."
>
> Two booms are fixed transversely over the body at about between the middle and outer thirds, the anterior third being the greater, that is, the outrigger apparatus is placed somewhat aft of the center of the hull. The booms rest on the gunwales and are lashed by a rope passed through a hole drilled in each gunwale. The float is a log of more buoyant wood than the hull; it may be narrower and also slightly turned up at the ends. The attachment of each boom to the float consists of two short sticks or pegs which normally are inserted into a single hole in the float and diverge slightly from each other above where they are lashed to the fore side of the boom. Apparently in many attachments the sticks slant gently forward from above downward. Rarely a pair of sticks may be lashed to the aft side of a boom, as in the nearest attachment (the front one of the right side) in Roth's photograph (1908, pl. L, fig. 4). "When a central staging is required, this is built up of two sticks tied parallel with the sides of the vessels, on to both booms, and smaller pieces in close apposition laid upon them transversely."

Roth (1910, p. 11) says: "It is noteworthy that now and again during the north west season foreign dug-outs are washed ashore at the mouth of the Batavia." In a letter he states that he thinks the canoe illustrated (1908, pl. L, fig. 4) was one of these, as its form is not typical. This photograph shows that below each boom a long stick passes through the gunwales and is lashed at its ends directly to the boom; the boom is also lashed to this stick on both sides of each gunwale. This "bracket-spar" (fig. 113, *b*), as I have termed it, is not shown by Roth (1910, fig. 10) nor does he allude to it, but it is shown in his photograph (1908, pl. L, fig. 4); the man is standing near the bow of the canoe.

Roth (1910, p. 16) refers to "toy sailing boats made by the boys at Mapoon (Batavia River), with a single outrigger, always on the weather side, which can be shifted from port to starboard and vice-versa as occasion requires; how far this innovation is due to civilising influences under missionary auspices, it is impossible to say."

There is a double outrigger canoe from Mapoon at the mouth of the Batavia River, Gulf of Carpentaria, in the Queensland Museum (Q. E. 17, 1215). According to information supplied to the Museum by the Rev. N. Hey of the Mapoon Mission, the canoe (*badra*) is made of *fibra* wood, cotton tree (*Bombax malabaricum*), as are the floats (*tradona*). The two booms (*tolsana*) are made of *tcherda*, mangrove (*Bruguiera rheedii*). The two diverging pairs of connectives (*a*, "hand") are made of a species of *Hibiscus*. The two sticks (*mo odo*), driven through the prepared holes in the hull to fasten the canoe and the booms together are made of *Premna obtusifolia*. The ropes used are obtained from various kinds of creepers and these should be soaked in water before being used. The two paddles are composed of the strong roots of the mangrove tree.

The Rev. W. F. Mackenzie of the Aurukun Mission, Archer River district, kindly informed me (August 1931) what an old native at the Mapoon Mission (Port Musgrave) had told him:

The idea of making canoes was passed from one tribe to another along the coast, but sometimes this took a long time, especially if there was a feud of long standing between two tribes on either side of a large river. The Mapoon people learned how to make canoes from the tribes to the north with whom they were related. Information came to them from Red Island, and the movement was traced thence to Muralug, Badu, Mabuiag, Boigu, and New Guinea.

I rather doubt whether this is an old tradition. Thomson, in a paper on a hero cult from the Gulf of Carpentaria (1934-a, p. 217), refers to the cult of a hero named Sivirri who made a drum and an outrigger canoe; eventually he went to Torres Straits where he did much fighting. This cult with the drum and double-outrigger canoe must originally have come to the lower Batavia River from Torres Straits. The "bracket-spar" or a straight stick through both sides of the hull under a boom, however, have never been recorded for Torres Straits or the south coast of Papua, though a similar stick occurs on the north coast from Cape Nelson westward. The language spoken at Mapoon is Chungungee [Roth calls it "Batavia River"].

The bow (*hree*) of the canoe (*partra*) in Mackenzie's sketch rakes up steeply and ends in a point. Close behind the bow a peg (*landrooee*) passes through the gunwales, to which is tied the mooring rope or the turtle-harpoon rope. The sides of the hull tumble home. The stern (*mbæukka*) is left solid and is flattened to form a seat for the steersman (*mbæar nummeroong*). Other seats are called *nveeah* and the paddlers *ndan kummeroong*. There is always a double outrigger, the center of which lies aft of the center of the hull. The two booms (*meree*, pronounced like Mary) pass over the gunwales; below each boom is a short pole (*landrooee*, "short stick"), which passes through holes (*ndæarpoonyon*) in the gunwales, and the boom is tied to the pole by three, or often five, lashings, with rope (*koe'uh*) made from wild *Hibiscus*. The float (*artemma*) has a flattened upper surface and is raked at the ends. The attachment consists of two pairs of short sticks (*landrooee*) which converge over the boom. Mackenzie was definitely informed by the headman that in former times the attachment consisted of two pairs of undercrossed sticks. If so, this arrangement could not have come from Torres Straits or the neighboring coasts of New Guinea.

After Mapoon was founded in 1891 a number of South Sea Islanders were sent as assistants, and later others, who did not return to their homes when *kanaka* labor in Queensland was terminated, came to Mapoon and among them several New Hebrideans. When a boy, Mackenzie saw undercrossed stick attachments at Vila. I agree with his suggestion that this was a temporary method at Mapoon and when the New Hebrideans died the original method of overcrossed sticks was reverted to. Well of canoe, *tshooro*; keel part, *mbæennie*; outside of hull, *yannang gar;* middle of canoe, *dennum-mar;* paddle, *ngumbah*.

From Port Musgrave the use of the canoe spread farther down the coast, but whereas the Mapoon people used the canoe before the foundation of the Mission and hence had their own names for all the parts, the people of Archer River (Aurukun Mission) did not know how to make canoes till the Mapoon people came down to help in the Mission, and here all the parts of the canoe are called by English names. During the past seven years the canoe has made its first appearance on the Kendall River [14° 4′ S.].

Mackenzie knows of two canoes having been washed up at Aurukun, one at Napa and at least one at Mapoon, which the natives believe came from New Guinea. He saw two, about 18 and 9 feet long, both beautifully made and so low that they could only have been river craft. He refers to two H-shaped vertical projections on each side near the bow and stern: "It seemed that pieces of wood had been jammed across the canoe fitting in the under clefts of the H." [I do not know anything in the canoes of southwest New Guinea which corresponds to these projections; the nearest I can find are two semicircular projections in similar positions on a Marind-Anim canoe figured by Wirz (1922, vol. 1, pl. 41, fig. 3).] There were no holes bored in the hull so there were no washstrakes. None of the canoes of the west or southwest parts of New Guinea have outriggers. The Queensland natives did not copy them in any way.

Cape York Types

A canoe somewhat resembling the Batavia River type made by the natives of the Cape York Peninsula at the entrance to the Gulf of Carpentaria, probably in Endeavour Strait, is figured by Wood (1870, vol. 2, pp. 7, 47):

The bow of the dugout ends in a blunt point and just behind it a short stick passes through both gunwales. Between the two proper booms are five poles, or false booms; a stringer is lashed to these and to the two booms and the inner connectives. The platform is composed of narrow longitudinal planks; there are no railings or crates, but the platform carries a fire.

Wood quotes from a letter from Mr. T. Baines, who made the original sketch:

The men had "shock heads of woolly hair and scanty beards. They were ornamented with scars and raised cicatrices tastefully cut on their shoulder and elsewhere." Bows and arrows and a typical Torres Straits bamboo tobacco pipe are mentioned. It is thus evident that these natives were more like the Kauralaig of Torres Straits than normal Queenslanders. Mr. Baines refers to several canoes, "some of very rude construction, being in fact mere logs capable of carrying a couple of men. . . . Others again were strictly double canoes, two of the narrow vessels being connected by a bamboo platform so as to lie parallel to each other at some little distance apart." So far as I am aware this is the only record of a double canoe for Australia; it was probably a local and temporary device.

At Cape York, according to Macgillivray (1852, vol. 2, pp. 15-17) the canoes

". . . are small, varying at Cape York between 15 and 30 feet in length. Even the Kowraregas [Kauralaig of Prince of Wales Islands] have much finer canoes than their neighbours. . . . The construction of a canoe in the neighbourhood of Cape York is still looked upon as a great undertaking, although the labour has been much lessened by the introduction of iron axes, which have completely superseded those of stone formerly in use. A tree of sufficient size free from limbs—usually a species of *Bombax* (silk-cotton tree) or *Erythrina*—is selected in the scrub, cut down, hollowed out where it falls, and dragged to the beach by means of long climbers used as ropes. . . . Two stout poles, fourteen to twenty feet in length, are laid across the gunwale and secured there from six to ten feet apart, and the projecting ends are secured by lashing and wooden pegs to a long float of light wood on each side, pointed, and slightly turned up at the ends. A platform or stage of small sticks laid across occupies the centre of the canoe, extending on each side several feet beyond the gunwale, and having on the outside a sort of double fence of upright sticks used for stowing away weapons and other gear. The paddles are five feet long, with a narrow rounded blade, and are very clumsily made. The cable is made of twisted climbers—often the *Flagellaria Indica*—and a large stone serves for an anchor.

"When desirous of making sail, the first process is to set up in the bow two poles as masts, and on the weather side a longer and stouter one is laid across the gunwale, and projects outwards and backwards as an outrigger. These are further supported by stays and guys, and, together with another long pole forked at the end, serve as a frame to support the pressure of the sails, which are usually two in number, made of matting of pandanus leaves, and average four and a half feet in width and twelve in height. The sails have a slender pole on each side to which the matting is secured by small pegs; when set, they are put up on end side by side, traveling along the backstay by means of a cane gromet. When blowing fresh it is usual to keep a man standing on the temporary outrigger to counteract by his weight the inclination of the canoe to leeward. From the whole sail being placed in the bow these canoes make much leeway, but when going free may attain a maximum speed of seven or eight knots an hour. Except in smooth water they are very wet, and the bailer (a melon shell) [not "melon husks" (Thomas, 1905, p. 68)] is in constant requisition." This type of canoe was copied from that of the Torres Straits Islanders.

F. and A. Jardine (1867, p. 83) admired the ingenuity displayed by the natives north of Newcastle Bay in the construction of their canoes, which are described as

". . . . formed from the trunk of the cotton tree (*Cochlospermum*), hollowed out. The wood is soft and spongy, and becomes very light when dry. The canoes are sometimes fifty feet in length and are each capable of containing twelve or fifteen natives." Two booms are "laid

athwart, having a float of light wood fastened across them at each end. . . . A stage is formed on the canoe where the outriggers cross, on which is carried the fishing gear, and invariably also fire. The canoes are propelled by short paddles, or a sail of palm-leaf matting when the wind is fair."

Describing his visit to Bird Islands, north of Cape Grenville in 1819, King (1827, vol. 1, p. 237) refers to two canoes which "appeared to be of similar construction to that seen at Endeavour River; but certainly were not more than sixteen or eighteen feet in length", but he does not mention whether the outrigger was single or double. He refers to Bligh (1792, p. 210) who says:

"On the north side [of Sunday Island, 11° 58′ S.], in a sandy bay, I saw an old canoe, about 33 feet long, lying bottom upwards, and half buried in the beach. It was made of three pieces, the bottom entire, to which the sides were sewed in the common way. It had a sharp projecting prow rudely carved, in resemblance to the head of a fish; the extreme breadth was about three feet, and I imagine it was capable of carrying 20 men." This was evidently the hull of a canoe of Torres Straits type with washstrakes, and King was wrong in stating that "it must have been of bark."

Jukes (1847, p. 134) says of the Murray Islanders of Torres Straits: "Their canoes appeared to be similar to those we had seen at Cape Direction" (about 13° S.).

There is no information concerning the method of the attachment of the float to the booms of the Cape York canoes, but the assumption is that it was of the old Torres Straits type, as also were the canoes. The Cape York natives had intercourse, sometimes friendly but often the reverse, with those of Torres Straits, especially with the inhabitants of Muralug. The Torres Straits Islanders in former days were in the habit of visiting islands and reefs within the Barrier Reef on fishing and turtling expeditions. They have been recorded as going as far south as 12° 30′ S., so the appearance of canoes of the Torres Straits type might be expected.

A large model of a double outrigger canoe with two booms in the Australian Museum, Sydney (E. 16080), was collected by Dr. Roth at Bloomfield River, Weary Bay (about 16° S.). W. W. Thorpe informs me that "the booms are continuous, fairly equally spaced along the length of the hull, pass over the gunwales, and are lashed in position with two-ply cordage, which passes under and over and through the perforations on the gunwales." Each attachment consists of one pair of sticks that meet over the boom. Bloomfield River appears to be the southernmost limit of this type.

Claremont Type

From about 11° 50′ S. to Balclutha Creek (14° 14′ S.) is found another type of double outrigger canoe with a direct tied attachment of the float to the two booms (fig. 113, *d*). This I have termed the Claremont type (1913, p. 617). It was first described by Jukes (1847, p. 105) at Cape Direction:

"The canoe was more than 20 feet long, made of a tree very much hollowed out, with the top sides tumbling well home. At both bow and stern was a projecting ledge, overhanging several inches. It had an outrigger on both sides, formed by laying a pole across the midship part, and another across the stern, projecting six or eight feet on each side, and fastening to the ends of these poles, which bent down so as nearly to touch the water, two flat boat-shaped pieces of light wood about eight feet long. . . . Their paddles were diamond-shaped in the blade, with long handles, so that they might be used by a man standing up. A coil of neatly formed rope lay in the bows, spare paddles, outriggers, spears, throwing sticks, small twine, fishing gear, large shells for baleing lay in the boat, everything neatly fastened into its place by a bit of line." Evidently it had no platform.

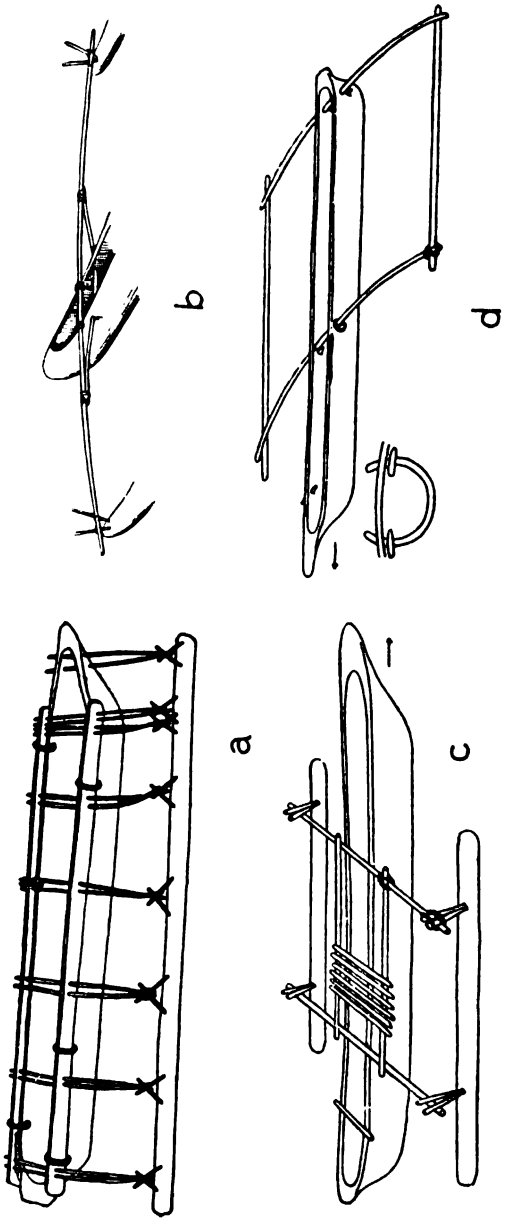

FIGURE 113.—Canoes of Cape York Peninsula, Queensland: *a*, Cape Bedford type (from Roth, 1910, fig. 12); *b*, Batavia River type, showing "bracket spar" (after Roth, 1908, pl. L, fig. 4); *c*, Batavia River type (from Roth, 1910, fig. 10); *d*, Claremont type (from Roth, 1910, fig. 11).

Roth (1910, p. 12, fig. 11, pl. 6, fig. 1) says:

"From Night Island [off Cape Direction] down to Claremont Point, the after boom is close to the stern, both booms being made to pierce the gunwale over which they are lashed to pegs driven through the sides below. Furthermore, the extremities of the booms are lashed on to the float direct, without any intervening pegs, an arrangement whereby the whole centre of gravity of the vessel is raised, the consequence being that the occupants have to squat in the bottom of the canoe. There may be a small peg forward to attach the line to. The paddle, worked in all dugouts with both hands, on either side of the canoe alternately, is fairly similar in all these northern types, with a long, comparatively narrow blade."

From Roth's photograph (1910, pl. 6, fig. 1) it is seen that the hull is clumsily made and stands high out of the water. The almost square fore end slants upward to form a projecting shelf and there is a similar but smaller one aft. The booms lie on the gunwales and do not pass through them. Below each boom is a short stick which passes through a hole in the hull and the boom is lashed to each end of the stick.

According to the recent account by Thomson (1934-b, pp. 242-244, pl. 29, fig. 2), double outrigger canoes are used by the Kawadji tribes, who range from the Wutati (Otati) in the north at Orford Bay to the Yintjingga of the Stewart River area, Princess Charlotte Bay:

The canoe (*tang'o*) is rounded at the bow (*pa'an*), cut away at the water line, and produced into a flat ledge (*yata*) on which the harpooner stands. On the starboard side of the bow a stick, 10 or 12 inches long, is driven through the hull close to the gunwale to form a support for the harpoon when not in use; the other end of the harpoon rests on the forward boom (*punta*). A sea-going canoe is usually 24 to 30 feet long and is manned by three or more men according to its size. The native words are in the Koka Ya-o language.

Thomson's photographs of a canoe of the Koka Ya-o, who occupy the coast and hinterland between Cape Grenville and Cape Weymouth, show that these canoes are of the Claremont type, but there is no record of a peg at the lashing as in the Archer River type. The culture hero is I'wai and the cult associated with him certainly came from Torres Straits.

SINGLE-OUTRIGGER CANOE
Cape Bedford Type

According to Thomson (1934-b, p. 243, pl. 30, fig. 1), the Koka Ompindamo, whose northern boundary is Balclutha Creek, Princess Charlotte Bay, and other tribes to the south have canoes with only one outrigger, which from his photograph are of the Cape Bedford type. Roth (1910, p. 13) gives the range of this type as from the Flinders group (about 14° S.) to Cape Grafton (about 17° S.), and says that "any such vessels found below this are not of local manufacture." In an earlier publication (1908) he says that these canoes come down to about the neighborhood of Hinchinbrook Island (18° 20′ S.) as is also stated by Howitt (1904, p. 10). Macgillivray (1852, vol. 1, p. 98) was told that at Palm Islands (18° 40′ S.) there were "large canoes with outriggers". Doubtless these had but a single outrigger.

The earliest record of the Cape Bedford type is that by Captain Cook on July 10, 1770 (Wharton, 1893, p. 286), who says that at Endeavour River he saw "a small wooden Canoe with Outriggers". This is the canoe referred to by Banks (1896, p. 286) as "a canoe made of wood with an outrigger". Banks (1896, p. 320) says:

"To the northward their canoes, though exceedingly bad, were far superior to these [the bark canoes to the southward]; they were small, but regularly hollowed out of the trunk of a

tree, and fitted with an outrigger to prevent them from upsetting. In these they had paddles large enough to require both hands to work them. Of this sort we saw few, and had an opportunity of examining only one of them, which might be about ten or eleven feet long, but was extremely narrow. The sides of the tree were left in their natural state untouched by tools, but at each end they had cut away from the under part, and left part of the upper side overhanging. The inside also was not badly hollowed, and the sides tolerably thin. We had many times an opportunity of seeing what burthen it was capable of carrying. Three people, or at most four, were as many as dare venture in it."

In 1819 near the entrance of "Blomfield's Rivulet", Weary Bay (15° 55′ S.), King (1827, vol. 1, p. 209) saw a dugout 21 feet long:

"Its greatest breadth in the bilge did not exceed fifteen inches, whilst, at the gunwale, the opening was only from six to eight and a half inches wide; an outrigger, projecting about two feet, was neatly attached to one side . . . and at each end was a projection, from fifteen to twenty inches long, on which the natives carry their fire, or sit; nothing was found in the canoe but two paddles and a long pole."

King (1827, vol. 1, p. 220) writes: "On the beach [at Endeavour River] we passed the wreck of a canoe, large enough to carry seven or eight persons; it measured nineteen feet in length and twenty-two inches in the bilge, and appeared, like that of Blomfield's Rivulet, to be made of the trunk of the *erythrina indica*, hollowed out either by fire or by some blunt tool." He gives a small drawing (1826, p. 225) of this type of canoe. There is a shelf fore and aft, the four booms pass through holes in the hull and their ends appear to be tied to the float, but the drawing can not be accepted as good evidence; the booms are represented as single and not twinned; the outrigger apparatus is placed more fore than aft.

At Rockingham Bay in 1848, Captain O. W. Brierly (1862, p. 304) states: "The natives have very neatly-made canoes; and further on, at a river opening in the mainland opposite the Frankland Islands [146° E., 17° 12′ S.] were not only catamarans or rafts, but canoes made out of the solid tree, and having an outrigger on one side; and it is somewhat remarkable that both the canoes and the catamarans at this place resembled those we afterwards met with at the south-eastern part of New Guinea." He also alludes to the Cape York canoes, but does not add to what was previously known. He continues: "There are at least six varieties of canoes and rafts along the north-eastern shore of Australia alone; and these are different from others found on the coast to the southward and in other parts."

The Cape Bedford canoe (figs. 113, *a*; 114, *b*) is figured by Roth, who says (1910, p. 13):

"Travelling from north to south, the stern projection gradually becomes more and more developed, until it closely approximates that of the bows, both extremities simultaneously changing from oval to square. The booms are all double, i.e., in sets of two, and form a staging on to which the spears and harpoons may be laid or tied. . . . Between the Flinders and Endeavour Rivers two wash-boards are lashed on to the outer sides of the gunwale, with or without an intervening coil of tea-tree bark, and through their upper free margins the double booms are pegged . . . They [the washboards] have already disappeared at the Bloomfield River, where the booms pierce the gunwale direct [1910, pl. 6, fig. 2; pl. 7]. The number of double booms will depend upon the size of the vessel, not less than four or more than eight having been observed, a double one occasionally being made to pierce the extreme bows direct; their two components are lashed—one above, the other below—to the angle formed by the tops of the crossed pegs morticed into the float. Two double-booms are sometimes placed in very close apposition."

The coil of the tea-tree bark referred to by Roth runs like a thick rope between the washstrakes and the hull in a model in the Köln Museum (fig. 114, *a*), and is continued around the aft end where the solid stern begins; it thus serves to prevent or to hinder water from washing into the canoe.

Roth (1910, p. 14) says that the best specimens of canoes are to be seen at Cape Bedford, whence the cast-offs and inferior canoes are traded to Cooktown. The bow end of the dugout is made from the butt end of the tree. He saw at Flinders Island in 1902

". . . a dugout with stretchers placed within it cross-wise, apparently with the object of preventing the sides approximating too much, an arrangement which recalled the crossed forked sticks supporting the ties in the Pennefather River bark canoes. The Bloomfield River dug-outs only differ from the Cape Bedford and Flinders type in the absence of wash-boards [washstrakes]. From the Mossman River down to Cape Grafton the dug-out is cut very square at either extremity [fig. 114, *b*], it often being very difficult, in the absence of the outrigger, to distinguish bow from stern, the former if anything being the larger; neither is raised above the level of the body. The space between the gunwales is extremely narrow, the sides being cut to overlap. The occupants sitting on the double booms are obliged to have their legs crossed one over the other. . . . This variety of dug-out can be made from at least five kinds of timber, and will range up to fifteen or sixteen feet in length." Mr. Thorpe informs me that there is a model in the Sydney Museum from Flinders Island collected by Roth which has not a washstrake; it resembles the British Museum model (Thomas, 1905, pl. 12).

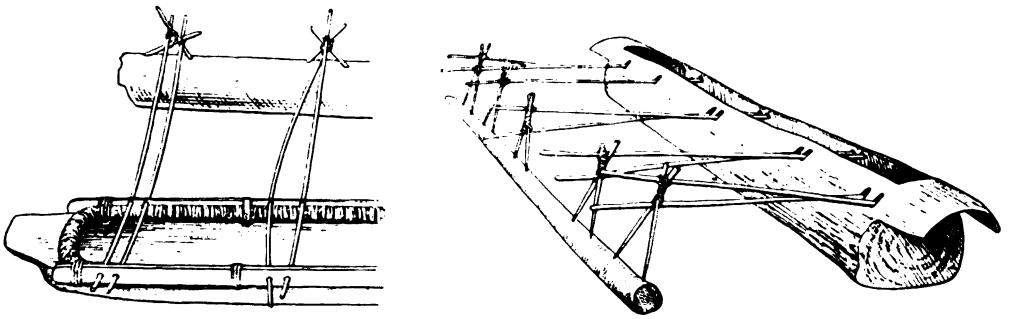

FIGURE 114.—Cape Bedford type canoe, Cape York Peninsula, Queensland: *a*, showing coil of tea-tree bark between washstrake and hull (after photograph of a model in Köln Museum); *b*, without a washstrake (after Roth, 1910, pl. 7).

Frequently at the fore end of the washstrakes there are two twin pairs of booms (four in all), close together, each pair having its crossed stick attachment, and there seems always to be a twin pair of booms at the bow in front of the washstrakes (fig. 113, *a*). The attachment for each of the twin pairs of booms thus consists of a single pair of undercrossed sticks. Sometimes one attachment stick is vertical and the other oblique, but neither rises above the boom; the lashing often obscures the exact arrangement of the parts.

Canoes with a washstrake are illustrated by Hutchinson (1906, vol. 1, pp. 52, 58) and Roth (1908, pl. L, fig. 3; 1910, fig. 12), and those without by Hutchinson (1906, vol. 1, p. 49), Roth (1910, pl. 6, fig. 2; pl. 7), and Thomas (1905, pl. 12, fig. 1). In a later edition of Hutchinson only the illustrations (n. d., pp. 89, 102) are reprinted.

A canoe from near Yarrabah, Cairns district, in the Queensland Museum, Brisbane (Q. E. 1827), has square ends, with the prominent fore-and-aft shelf concave-convex, the upper side being convex. The narrow float is as long as the hull. The four twin booms rest on the edge of the hull, to which they are lashed. Each element of a twin boom is lashed to the angle at the side of the crossing connective and not one above and the other below the crossing, as is typical. A similar lateral lashing of a boom to the crossed connectives is to be seen in a Cooktown canoe in the Melbourne Museum.

Mr. H. A. Longman, Director of the Queensland Museum, informs me that the Museum has received the hulk of an old canoe (Q. E. 3130) which was found on the north shore of the Endeavour River in 1930:

> "This is approximately 8 feet in length. Evidently there were four sets of booms, for there are four series of holes on each side. There are two holes on each side for the first and fourth booms, and three holes on each side for the second and for the third booms. The hull is shaped somewhat similarly to the Mapoon Mission one, and is not square-ended."

SUMMARY

The variety of the outrigger canoes of North Queensland (fig. 111) affords an interesting problem. Unfortunately there do not appear to be any traditions to account for any of them, nor, so far as I am aware, are there any other cultural traits that might afford contributive evidence. Thus, for the present, we have to rely solely upon a comparative study of the canoes themselves.

The most southerly form is the single outrigger or Cape Bedford type which extends from about 14° to 18° 50′ S. The booms are twinned and passed through both gunwales, or through the strakes when these are fitted. The twin booms lie close together side by side and the free end of one is lashed over the angle of a single pair of crossed sticks and that of the other under the crossing (or in a few cases the twin booms may be lashed to the angles of the sides of the crossing). The crossed sticks do not extend upward beyond the boom.

An attachment of undercrossed sticks is characteristic of most parts of the eastern half of New Guinea; it is found in a few places in the Bismarck Archipelago and also in the Banks Islands and northern New Hebrides. I do not know of any close analogy to the twin booms. In the Hermit Islands, west of the Admiralties, each boom rests on the crossings of several pairs of sticks. One end of a short spar (*bulen*) is lashed to the under side of each boom and its free end lies under the crossings; if the added spar were longer and inserted into the hull, as the booms are, the arrangement would be somewhat similar to that of the Cape Bedford canoe, but the Queensland canoe attachment consists of a single pair of undercrossed connectives as in the Gulf of Papua.

There can be little doubt that the Cape Bedford type of canoe has a Melanesian origin, but it does not seem possible to say more with safety.

The canoes of the central region of the Cape York Peninsula are characterized by double outriggers of two booms with a direct lashed attachment. A washstrake is absent, and apparently in the east (Claremont type, about 11° 50′ to 14° 14′ S.) the booms pass through the gunwales and are placed toward the aft of the hull. In the west (Archer River type, from about 13° to at least 14° S.) the booms lie upon the gunwales and are in a central position.

A direct lashed attachment is very rare in Melanesia, though it is widely but sparsely distributed in Indonesia. It is found to some extent in Micronesia. It is universal in the Hawaiian islands and it is found elsewhere in Polynesia but for the aft boom only. I saw one small canoe of this type in the Bamu Delta region east of the Fly in British New Guinea (p. 207), but this appears to have been merely a casual example of no distributional significance (Haddon, 1920-a, p. 125). The only Melanesian example known to me is the *kop* of Nissan, north of Bougainville (Krause, 1907, fig. 101; Friederici, 1912, p. 298; Haddon, 1913, p. 625, fig. 14). Here there is a double outrigger of two booms with a direct lashed attachment (fig. 73). The booms pass through the hull and are in a central position. The backward position of the outrigger apparatus in the Claremont canoes

is unusual, but it is found in small double-outrigger canoes with two booms and a direct lashed attachment at Sulu, Indonesia (Guillemard, 1889, p. 206; and photographs).

Farther north the canoes have a double outrigger of two booms and a stick attachment. The Batavia River type has an attachment of two slightly divergent sticks which are lashed to one, usually the fore, side of the boom. Roth's photograph (1908, pl. L, fig. 4) shows that each boom is further supported by a bracket-spar that passes through the gunwales, its ends being directly lashed to the boom; but this is probably merely a variant of the straight stick of the Archer River type.

The *tsine* canoe of Nissan has a precisely similar attachment and bracket-spar (*kisiu*). It also has two booms, but the outrigger is single. (See Krause, 1907, fig. 120; Friederici, 1912, fig. 98; Haddon, 1913, figs. 5, 6.) In a letter Friederici says: "These supporting spars beneath the outrigger poles of the *tsine* with one outrigger are also to be found in the canoe of northern Bougainville."

The correspondence of the Claremont and Archer River types with the *kop* and of the Batavia River type with the *tsine* is so remarkable as to lead one to suspect that an actual migration from the northern Solomons to North Queensland has taken place, but this assumption is beset with difficulties. Nothing like either of these types is found in the intermediate areas, and it is scarcely possible that such canoes could travel for a long distance in the open sea. The voyagers would have had to land for a longer or shorter time at numerous places on their way, and if the places were inhabited it does not follow that they would have had a friendly reception. The journey would thus take a long time. On the other hand the voyagers might have come fairly rapidly in some kind of seaworthy craft, but for this there is no evidence. The Nissan plank-built boat (*mon*) of the present day seems unsuitable for such a voyage.

Probably it will be generally admitted that the *kop* and *tsine* types of canoe belong to different cultures and that they were brought to Nissan by separate migrations. Nor must the possibility be neglected that two analogous streams of migration reached North Queensland direct from Indonesia, though the journey would be beset with the same difficulties as the indirect journey from Indonesia through Nissan. There does not appear to be any other cultural evidence to support either hypothesis of the introduction of these two canoe types to Queensland.

The Archer-Claremont type has its nearest analogues in the Philippine Islands, but the Batavia River type is unknown in Indonesia. A stick attachment is found there only in the Nicobar and Andaman Islands, but it is of a different kind and the canoes have only a single outrigger. The bracket-spar of the Batavia River canoe is doubtless related to the two sticks to which each boom is lashed in the Archer River and Claremont canoes. An attachment somewhat similar to that of the Batavia River canoe seems to have been used formerly in Torres Straits, according to a drawing by Melville (Haddon, 1912, pl. 24, fig. 1), but it is doubtful whether this was the usual form. It is, however, certain that the typical Torres Straits canoe was purchased and copied by the Australian natives of the Cape York area and that in a simplified form it extended sparsely down the east coast to about 16° S., or perhaps somewhat farther south. It thus overlapped the distribution of the other two types of the east coast.

The name of the Queensland double-outrigger canoes varies from area to area, but it must be remembered that elsewhere an outrigger canoe may have one term and the hull itself another, the name of the hull in many cases being that of the tree of which it is made. So it is probable that the following terms refer more

especially to the hull. The Nggerikudi tribe, Batavia River: canoe, *partara;* boom, *ar* (hand); attachment, *landrui*; float, *ar-temma* (little finger) (Roth, 1910, p. 15). Yaraikana tribe, Endeavour Strait, Cape York: canoe, *atu;* float, *tama* or *watari* (Ray, 1907, p. 275). Gudang tribe, Cape York: canoe, *angganya;* boom, *togo;* float, *charima.* Macgillivray (1852, vol. 2, p. 291) gives in parallel columns the names of the various parts of a canoe in the Gudang language and in that of the Kowrarega (Kauralaig) of the Muralug (Prince of Wales) Islands, who speak a dialect of the Western Torres Straits language. In the Kauralaig we find: canoe, *gul;* boom, *togo;* attachments, *sarim pati;* float, *sarima.* Other western island names are: boom, *tug*; attachment, *saiu pat*; float, *sa-ima.* In the Gudang and Torres Straits languages the term for float is a variant of the common Austronesian word. Ray (1907, p. 278) gives canoe, *kowata,* for the Otati tribe near Cape Grenville.

The names of the Queensland single outrigger and its parts are: Cape Bedford canoe, *wangga;* boom, *dabbul* (*tabul*); attachment, *kanna kanna;* float, *darman;* washstrake, *yirmbar;* hull, *banchirn* (*bantchan*); paddle, *biribe* (Roth, 1910, p. 15; 1901, p. 15 for the alternative terms). Canoe only, neighborhood of Cooktown: *wangga, marakan* (Phillips, 1897, p. 144). Curr (1886, vol. 2) gives the following: Endeavour River, *marigau* (Captain Cook), *maragan* (P. P. King); Weary Bay, *berongaboy* (T. Hughes); Granite Range at the head of Walsh River, *murregan* (R. R. Davidson), Curr (1886, vol. 2, p. 414) remarks that this is much the same as in the Endeavour River language. Edge-Partington in Thomas (1905, p. 74) gives for the Cairns district canoe, *patchie.*

Of these canoe names, *banchirn, marakan,* and its variants, *patchie,* etc., are doubtless indigenous terms for the hull and perhaps for canoes without an outrigger, or for bark canoes. *Wangga* is the equivalent of *waka,* which is the almost universal Austronesian word for an outrigger canoe and has many local variants, and the same applies to *darman* for float. For float we find in New Guinea: Motu, *darima;* Massim, *sarima, sama,* etc., and similar variants occur all over Melanesia, Polynesia, and elsewhere. Roth (1910, p. 14) says that the best specimens of canoes are to be seen at Cape Bedford, and here the original names are also best preserved. He also says that the natives of Cape Bedford speak the Koko-Yimidir language in its full purity; this language is spoken along the coast from the Annan and Endeavour Rivers to the northern side of Cape Flattery, although it is understood considerably beyond these limits (Roth, 1901, p. 5).

There does not appear to be any direct evidence concerning the relative chronology of the introduction of the types of outrigger canoes into Queensland, though it is certain that they were introduced. Thomas (1905, p. 73) says, "The single outrigger which obviously preceded the double form extends as far as 18° 13′ S. on the east coast, thus overlapping the area of the bark canoe." Probably he based this statement on the fact that it was the farthest from the original home and therefore the oldest, but it certainly belongs to a migration quite distinct from the others and alone has preserved the name *wangga;* to my mind there can be little doubt that it is the most recent of them all.

After the foregoing was written, Davidson has tackled the problem of the chronology of the Australian outrigger canoes (1935, pp. 9-16, 69-71) and other watercraft. He follows the method of the concentric zoning of traits in diffusion in order to draw therefrom historical inferences and thus comes to the conclusion that "it seems quite certain that the geographical sequence along the coast of the Cape York Peninsula from south to north represents the order in which these methods [of attaching the boom to the float] were introduced into Australia. . .

This conclusion is also supported by the little historical information available, which shows that diffusion has been southward along the coast of Queensland. . . The Australian evidence also demonstrates that the single-outrigger diffused earlier than the double-type." When dealing with sea-going vessels it should be remembered that it is probable that a more advanced type of craft may easily spread farther than less advanced types and thus nullify a purely zonal distribution. I still adhere to the view that the Cape Bedford type is the most recent type in the Cape York Peninsula. I suggest that this type did not travel coastwise from the east but came directly across the Coral Sea, perhaps by stress of weather and not by intention. [Owing to a misprint the terms "Cape Bedford" and "Claremont" on lines 2 and 5, page 631 of Haddon, 1913, were transposed. This has led Davidson (1935, p. 70) to state that I regarded the Claremont type as more recent than the Cape Bedford type, whereas the opposite is the case as the context implies.]

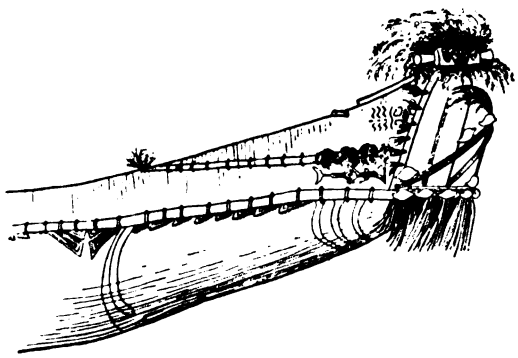

FIGURE 115.—Decorated bow of a *gul*, Mabuiag, Torres Straits (sketched in 1888).

TORRES STRAITS

The following information is taken with minor modifications from my previous accounts (1912, pp. 205-217, pls. 24-26; 1935, pp. 305-314). There was no essential difference between the old canoes (*gul*, W; *nar*, E) of the western (W) and those of the eastern (E) islands of Torres Straits. The older type had the following construction:

The hull (*gar*, W; *gem*, E) is a dugout 30 to 60 feet long, or occasionally longer, the ends of which gradually slope up to a blunt point. A washstrake (*garbad*) extends from bow to stern and it is laid on the edge of the hull; a split bamboo is placed over the joints and the whole lashed with sennit (fig. 115). A washstrake appears to have been absent from many of the canoes of the eastern islands of Erub and Mer and this is still the case. A long, triangular fore washboard (*sabi*, W; *werem sab*, E) is similarly attached to the bow. The strakes are closed in fore and aft by a breakwater (*gab*, W; *garbad*, E). In some canoes seen at Mabuiag the hollow stern end of the hull is cut square, as in the Bamu canoes, but here the end is boarded over and this aft breakwater is higher than the upper margin of the washstrakes (fig. 120, *a*). The front part of the *sabi* has a small decking (*awar*, W; *lak sop*, E) which is supported by crossbars or thwarts. A stout stick passes through the *sabi*, the end (*gudagub*) which projects on the starboard side serving for the attachment of the anchor rope. Crossed struts (*dami* or *doam*, W; *zirim*, E) may be inserted in the cavity of the hull to keep it more open (fig. 116, *a*).

A double outrigger (fig. 116, *a*) is lashed onto the washstrakes; it consists on each side of two booms (*tug*), made usually of bamboo and placed about 6 feet apart; these project 1 to 2 feet on the off side of the hull and about 10 to 12 feet on the float side; each boom of one side of the canoe is lashed to the corresponding boom of the other side. A platform (*natar*, W; *tam*, E) is built on the booms and projects a foot or two beyond each side of the hull and

these sides are provided with a wattled crate (*kusil,* W; *sal,* E) to carry food, gear, and other equipment (fig. 117). Occasionally in former times a mat or leaf awning was erected over the platform; there is generally a central fireplace.

The float (*saima,* W; *sirib,* E) is made of light wood and pointed at each end where it is usually gradually turned up; commonly the upper surface is slightly raised at the spots where the attachment sticks are inserted. The typical method of connecting the float to the booms is by means of two pairs of stick connectives (*saiu pat,* W; *kag,* E) which are inserted into the float and are lashed to each boom. The sticks of each pair usually converge over the boom, but do not necessarily cross over it, and each pair diverges from the other pair; or the sticks may be parallel (fig. 116, *b,* 1, 2). Drawings made by H. S. Melville, the artist on board H. M. S. *Fly,* indicate that in 1845 the attachment of an Erub canoe might consist of two sticks which diverged from each other and apparently were lashed to one side of the boom (fig. 118). Melville's drawing in Jukes (1847, vol. 1, pl. p. 169) also shows a central lashing of each attachment from the boom to the float. In a model of a canoe in the British Museum a similar attachment of two sticks occurs, but the sticks are attached to the fore side of the fore boom and to the aft side of the aft boom, as illustrated by Edge-Partington (1890, pl. 320, fig. 1).

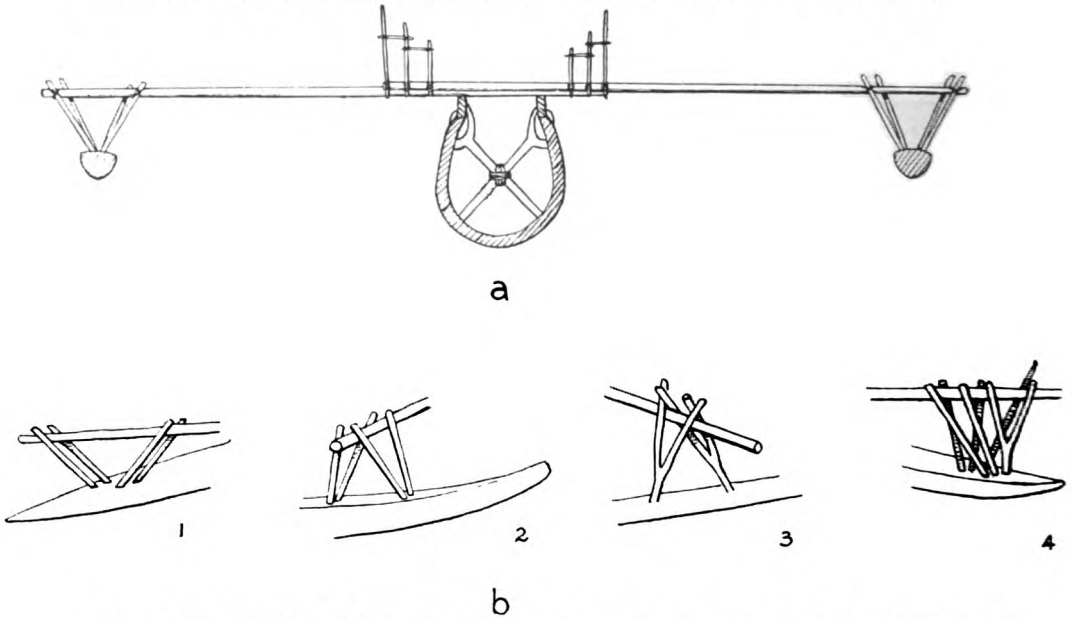

FIGURE 116.—Details of the *gul,* Mabuiag, Torres Straits. *a,* section. *b,* attachments: 1, parallel connectives; 2, the typical method; 3, typical Loyalty Islands attachment introduced into Mabuiag; 4, a composite attachment.

In 1888 there was a canoe at Mabuiag owned by a native of Uvea (Loyalty Islands) who had re-outrigged it according to the fashion of his own people with a single outrigger, four booms, and paired Y-stick connectives. Some local western natives were fitting up a canoe with a single outrigger in imitation of it, but ten years later many of the Mabuiag canoes still had the double outrigger (Haddon, 1912, p. 210). This is the origin of the anomalous Y-shaped stick attachment of a canoe with a single outrigger of four booms that was figured by me (1913, p. 624) and later was traced by me to the Loyalty Islands (1918, p. 114), where I record that when Dr. S. McFarlane founded the Mission in Torres Straits in 1871 he took with him Lifu and Maré converts; other Loyalty Islanders followed in their wake. I have a photograph, with no history, which was taken many years ago in Torres Straits. It is of a large canoe with at least seven booms and a very long float; each attachment consists of two converging Y sticks and between them are

FIGURE 117.—Double-outrigger canoe (*gul*) with platform, Mabuiag, Torres Straits (photographed in 1898).

two vertical sticks; the numerous booms also indicate foreign influence. Figure 116, *b*, 3 is a typical Loyalty Islands attachment introduced into Mabuiag; figure 116, *b*, 4 is a composite method, being based mainly on a somewhat simplified type of the attachment characteristic of the estuary of the Fly, but the Y stick has also intruded. Two of the attachments of a two-boomed double-outrigger canoe were of this mixed form, the other two were normal.

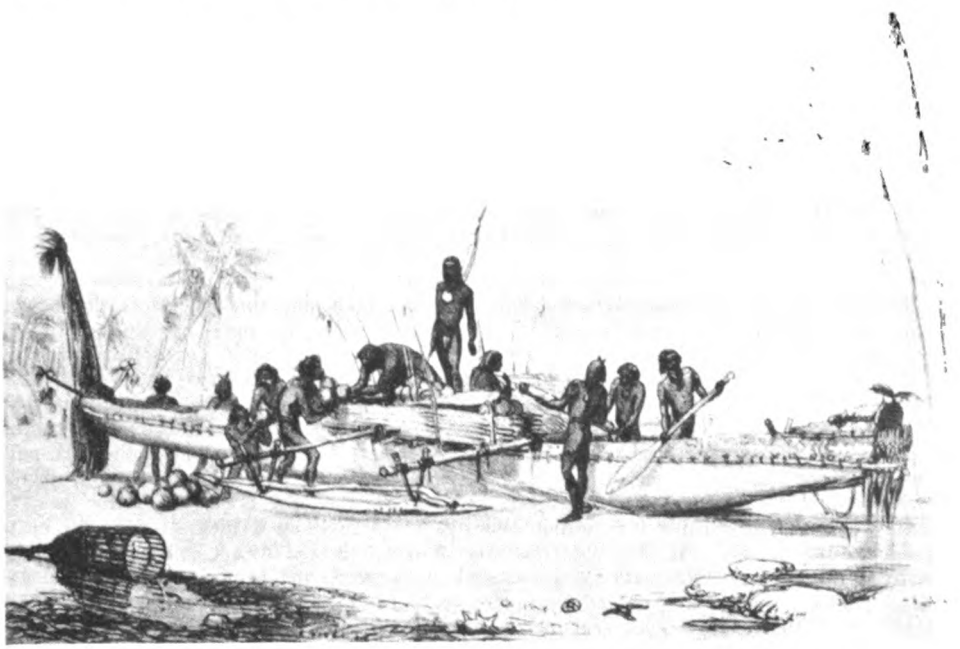

FIGURE 118.—Erub *nar*, Torres Straits (drawn by H. S. Melville, 1845).

The clumsy paddles (*kaba,* W; *uzer,* E), are about 5 to 6 feet long and are undecorated, but in some paddles there is a simple beading at the grip; the blade is an elongated oval. A board or large paddle is used as a rudder (*kuli,* W; *kor uzer,* E). Bamboo poles are used for punting the canoes in shallow water. A large stone attached to a rope is kept in the bow to serve as an anchor (*iadi,* W; *par,* E). A melon- or bailer-shell (*Melo diadema*) is generally used as a bailer, but a spathe of the coconut palm is often so employed (Haddon, 1912, fig. 208). Mats are often placed on canoes when they are beached as a protection against the sun.

The sails (*waku,* W; *moder,* E) of former days were large oblong plaited mats, which were kept rigid by being skewered on each side to a bamboo pole (*waku tag,* W; *naiwe,* E). A grommet (*guguba,* W; *gagob,* E) was attached to each side pole about one third of the way from the top, which enabled the sail to slide up and down the backstays. A canoe with one sail was rigged as follows:

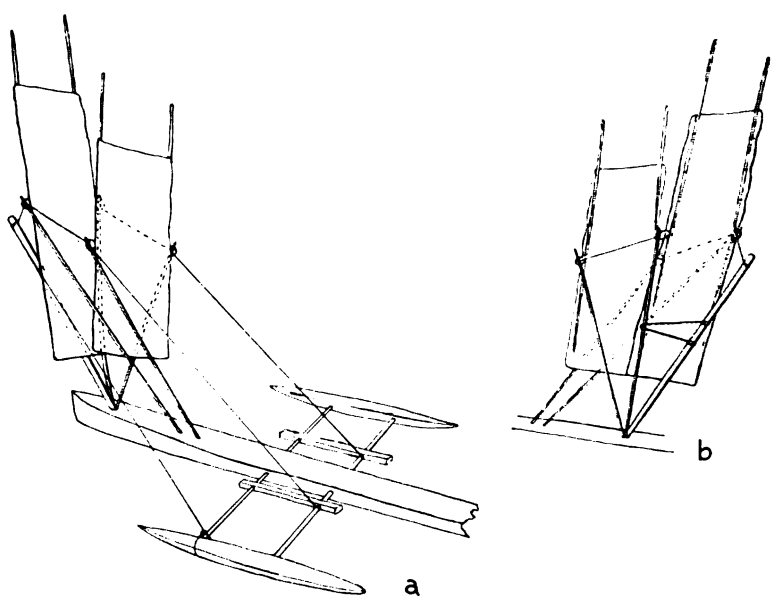

FIGURE 119.—Rig of a Mabuiag canoe with two sails, Torres Straits: *a,* seen from port side looking forward; *b,* seen from starboard bow (diagram based on temporary models).

A shoe (*tir,* E) was placed in the bow immediately behind the small fore deckboard. On it was stepped a stout mast (*rangad* or *rad,* W; *morgober,* E) made of mangrove wood, which sloped to port (or windward); there was also a second mast (*karas*) of bamboo, which was approximately vertical or sloped slightly to starboard. The two masts were kept from diverging too far by a cord (*lumulam,* W; *atakobi lager,* E), which was fastened by its ends to the *rangad* and looped round the *karas* (fig. 119, *b*). A guy (*gawal uru,* "rope of the *gau*") passed from the head of the port mast (*rangad*) to the outer end of the fore port boom, but more often to the end of a stout horizontal pole (*gau,* W; *geau,* E) that projected to windward in front of the port outrigger. A man stood on the boom, or on the *gau,* to balance the canoe by shifting his position and steadied himself by a stick stuck in the crate (Haddon, 1912, pl. 26). At Mer the *geau* was 12 feet long and was a constant feature; it was fixed between the two masts, and the stick with which the man steadied himself was similarly fixed. A backstay (*rangadal uru,* W; *morgober lager,* E) passed from the head of the port mast through the port grommet to the base of the aft port boom central to the crates, and was manipulated by a man who stood on the platform. Another backstay (*karasil uru,* W; *karas lager,* E) passed from the head of the starboard mast (*karas*) through the

starboard grommet to the base of the aft starboard boom, and was held by one of the crew standing on the platform. In setting sail the two backstays were passed through the grommets of the sail, which was pushed into position by means of two bamboo struts (*parungaizinga*, W; *narbet akmeret lu*, E); the end of each strut was cut into a fork. When the sail was home only the strut on the port side was retained, the fork fitted into the grommet and the strut propped up the sail against the masts, its lower end was lashed to the washstrake about halfway between the bow and the port outrigger. A *kupul uru* ("tail rope") or sheet was attached to the starboard lower corner of the sail and made fast to the first thwart of the platform.

Two sails (fig. 119) were generally used:

The second and smaller sail (*dada waku*, W; *keimer moder*, E) was placed close behind the principal one (*waku*, W; *narbet moder*, E). A starboard strut (*paupa tarai*, W, "lee, put upon") was stepped in the shoe and it sloped to starboard (leeward) aft of the front sail. The aft sail was run up the two backstays in a manner similar to the front sail and its starboard grommet was hitched over the top of the *paupa tarai*. This sail was propped up by a port strut as in the front sail, the lower end of the strut was fastened to the port washstrake behind the former strut. A sheet was attached to the starboard lower corner of the aft sail and was made fast to the front thwart of the platform.

Apparently there was no starboard strut for the *keimer moder* of Mer; it was supported by its two lateral *naiwe* and the port strut. Sometimes if they had light winds the Murray Islanders erected three sails, called *narbet* (elder), *eip* (middle), and *keimer* (younger) *moder* (sail).

A sailing canoe of Torres Straits, drawn by Lt. G. Tobin in 1792, is illustrated by Lee (1920, p. 184); it conforms in general structure with the foregoing. So far as I can understand his drawing of the rig, the *rangad* and *karas* are not shown, presumably being hidden by the front sail, but the end of the *paupa tarai* appears from behind the aft sail:

The *gawal uru* is tied to the end of the horizontal *gau* on which a man stands and steadies himself with a long bamboo pole projecting outward and upward from the bow; the backstays for the front sail pass through their grommets to be attached midships. The aft sail is run up on separate backstays. The port side backstay passes through the port grommet of the front sail and then through the port grommet of the aft sail to be attached midships; the starboard backstay is apparently tied to the *paupa tarai* and passes through the starboard grommet and is attached midships. There are two bamboo struts which are inserted respectively into the port grommet of each sail. If this interpretation be correct it follows that the fore sail is run up on backstays from the *rangad* and *karas* respectively and the aft sail on backstays from the *rangad* and the *paupa tarai*, and in these respects the rig differs slightly from that first described.

A lee-board (*walunga*) is fixed on the starboard bow when sailing and is kept in place by a bamboo which is lashed to the outside of the hull.

In former days the larger canoes were richly decorated fore and aft. A simple incised pattern (figure 115) ran along the edge of the dugout, and designs were painted at its ends, though but rarely along its whole length; devices were painted on the fore end of the strake and on the fore washboard. A carved and painted figurehead was attached to the breakwater and in front of the dugout was a horizontally projecting, V-shaped band decorated with cowry and *Ovulum* shells and a deep fringe; cassowary feathers were added in profusion. The stern carried a tall carved board (*kun*) and various inclined carved sticks (*gozed*) all of which were ornamented with feathers, tassels, and shells (figs. 117, 118).

Among the western islands European sails had not quite supplanted the original mat sails in 1888, but I saw none of the latter in 1898.

The canoes of the eastern islanders were in an interesting stage of transition in 1898. In some the old double outrigger had been retained though details were not so carefully made as formerly. In these, as in all other sailing canoes, the mat sails had given place to European sails, there being a mainsail, fore-

sail, and jib. The foresail still retained its old name of "elder brother sail" referring to the time when it was the more important sail, while the main sail was termed "younger brother sail". There was no bowsprit. On being questioned, the Murray Islanders admitted that the single outrigger had been adopted in imitation of canoes rigged by South Sea men, and attributed its introduction to Mataika, about 1873. Finsch (1914, p. 475) saw canoes with single outriggers and canvas sails at Mer, in 1882. In some canoes the float was exceptionally long and thin, in one it was practically as long as the hull. In many canoes the numerous booms of the single outrigger support an almost continuous platform from near the float to about an equal distance on the off side of the hull and the crate is absent; all these details are innovations.

I have dealt at some length with the foregoing as it is important to know when and how alterations in native rig occur.

Folk tales collected by Landtman (1917) are referred to by me (1935, pp. 307, 308); they state that in ancient times the islanders had only a canoe made of a solid hull fitted with a double outrigger, a little platform, and a mat sail. The western islanders learned from the natives of Saibai, and the Yam-Tutu people from those of Daru, how to make dugout canoes, but the Saibai and Daru folk had learned the art from the mainland of New Guinea, and these used only a single outrigger. The islanders added a double outrigger and made other improvements. In a version I obtained (1904, p. 48) two Tutu men who introduced the dugout from Daru voyaged there by paddling two logs of wood they had tied together. Landtman (1917, p. 499) records a folk tale which says that the original canoes of More (Mer, Murray Islands) were solid logs with two outriggers, and that later the Miriam procured dugouts from Kiwai which started the traffic in canoes that has continued ever since.

PAPUA (BRITISH NEW GUINEA)

WESTERN DIVISION

On the coast of New Guinea, opposite Torres Straits, outrigger canoes are employed only by the Kiwai-speaking peoples who live at Mawata at the mouth of the Binaturi and one or two villages to the east, and by the natives of the islands in the estuary of the Fly, the most important of which is Kiwai. The people who inhabit the estuary of the Bamu speak a different language, but have on the whole a similar culture; they also have outrigger canoes.

MAWATA

Landtman (1927) gives a good deal of valuable information about the ancient and modern canoes of the Kiwai-speaking peoples, more especially of those of the Mawata folk, and he records instances from folk tales of the utilization of floating tree trunks for traveling from one place to another. In some places a vine is suspended across the river, by the help of which people ferry themselves over, standing on a bamboo raft, or they pole the raft, which is a roughly made structure. Landtman (1927, p. 207) says:

> "The earliest craft of which Kiwai traditions bear witness was made of a solid trunk, sloped at both ends up to a blunt edge or point. Two or more pairs of sticks about ½ m long were driven into the trunk, forming oblique crosses, and over these were lashed two transverse booms rather more than 1 m apart. The long ends of each pair of booms were attached to a pointed float by means of similar sticks, driven into the floats. Over the middle of the trunk, on the top of the booms, a little platform was constructed, affording shelter from waves which

were washing over the trunk. In the bow was a mat sail in the shape of an elongated triangle, with the apex pointing downwards. The two poles or masts between which the sail was suspended were inclined slightly forward, and kept in position by two stays, the other ends of which were tied to the foremost transverse boom on either side of the platform. By tightening or loosening one stay or the other the position of the sail could be regulated according to the wind. To prevent the sail from being torn, a long rope was tied crisscross between the two supporting poles, so that the sail rested against the rope. A board was used for steering the canoe, and the steersman, standing at the stern end of the trunk, was often submerged over knee-deep in the waves. A stick driven vertically into the trunk in front of him served as a support."

In recent times the people in the Mawata district usually procured their canoes from or through Kiwai. In former times they were made locally though never on a large scale. Landtman (1927) and Riley (1925, pp. 108-116) give details of the making of a canoe and the rites and beliefs connected therewith. The following account is mainly a transcript from Landtman (1927, p. 209):

The bush was cleared round the tree to be felled and a bed prepared for it to fall on. When felled, the branches were removed and the upper part of the trunk was cut flat from end to end. The shaping of the canoes invariably began at the bow end, the stern was worked at when the rest was nearly completed. When hollowing out the inside, the workers usually cut first a row of holes longitudinally, afterward breaking away the intermediate parts of the wood. The stone axes were mostly used adz-wise by being turned round in their hafts. Only shallow cuts could be made with a stone ax, so the operation consisted principally in bruising the wood into rough splinters which were removed one by one. The interior of the hull was afterward burnt smooth, and the outside was also treated with fire to make the wood harder and less perishable. Water was kept handy to prevent the fire from burning the wood. After the hull was nearly completed in the bush, a great number of people were summoned to haul it to the shore or some creek; rollers were used underneath to facilitate transport. The craft was taken to the village and there provided with its final equipment.

In former times Kiwai canoes, both large and small, had a single outrigger which was invariably on the starboard side, and except for the resting of the booms directly on the sides of the dugout, the general structure was much the same as in the ancient log canoes and has been continued to the present time. A small platform (*kusi* or *taratara*) was built across the booms. Landtman (1927, p. 210) writes:

"The sails in the bow were of the same type as those of the log canoes. In a strong wind only one was used, but occasionally as many as four were rigged up more or less side by side in the shape of a fan. The sails [*tiro*] were made of strips of pandanus leaves (*tiro*) sewn together. Masts and sails had to be removed temporarily when harpooning was to take place from the bow, also in a head wind, when the craft was propelled by paddling only. There was also a balance arrangement in the bow, consisting of a pole [*gawa oti*] projecting horizontally from the masts to windward; a man would stand upon this to counteract the pressure of the wind, while a stick fixed obliquely upwards in the same spot gave him support. The pole and stick could be shifted from one side of the canoe to the other, according to the tack on which the craft was sailing. The canoe was steered with a paddle [*aibi*]."

A new canoe is elaborately painted and decorated with carvings and various ornaments, in connection with which are held certain observances narrated by Landtman (1927, pp. 210, 211):

The owner provides the bow of the canoe with painted eyes, also gluing on real eyes of a *ruburubu* or of a *wario* (two large hawks). After that the canoe "all same proper man he look, he see what place dugong, turtle he stop". An old couple also "wake up" the canoe by twice swinging a bullroarer close to the bow.

Landtman informs me that on some canoes the painted decorations, such as a row of hearts, a breastbone or shoulders, sinews, or a tongue (an inverted triangle) have a magical reference to fighting.

According to certain traditions recorded by Landtman (1917) dugout canoes were introduced to the western Torres Straits islands from the Kiwai district and it is also stated that the Kiwai peoples copied the double outrigger from the islanders and at the same time several changes were made in the construction of a canoe.

Landtman (1927, p. 212) says: "While the ordinary word for canoe is *pe*, one with a single outrigger is called *tataku*, and one with double outrigger *moto-moto* [*moto*, house], a particularly fine one *burai*."

The large Mawata canoe is essentially similar to that of Torres Straits:

> The hull is a dugout with both ends raked and produced to a blunt squared point. The stern end is called *pe wapu* (canoe tail). The cavity (*peniro*) of the hull may be provided with crossed struts (*doirome*). The sides of the hull are heightened by means of a washstrake (*bodo* or *aitami*) on which, at each side of the bow (fig. 120, *c*), is a triangular fore washboard (*sabi bodo*) the fore part of which is covered by a deck (*waro*), mainly for harpooners to stand on. A breakwater (*gabo*) closes in the front of the *bodo* and *sabi bodo*; to this a figurehead (*gopegope*), ornamented with cassowary feathers, may be attached. An aft breakwater (*wapu gabo*) closes in the washstrakes at the stern (fig. 120, *b*), and in front of it a small board is usually placed athwart the washstrakes. Each washstrake is sewn with rattan on to the edge of the dugout, a split bamboo (*maumaro*) having been laid previously along the junction inside and outside with its convex side outward. The longest canoe I saw at Mawata in 1914 was 48 feet 2 inches long; the greatest inside diameter was 3 feet 2 inches with 2 feet 8 inches between the washstrakes.

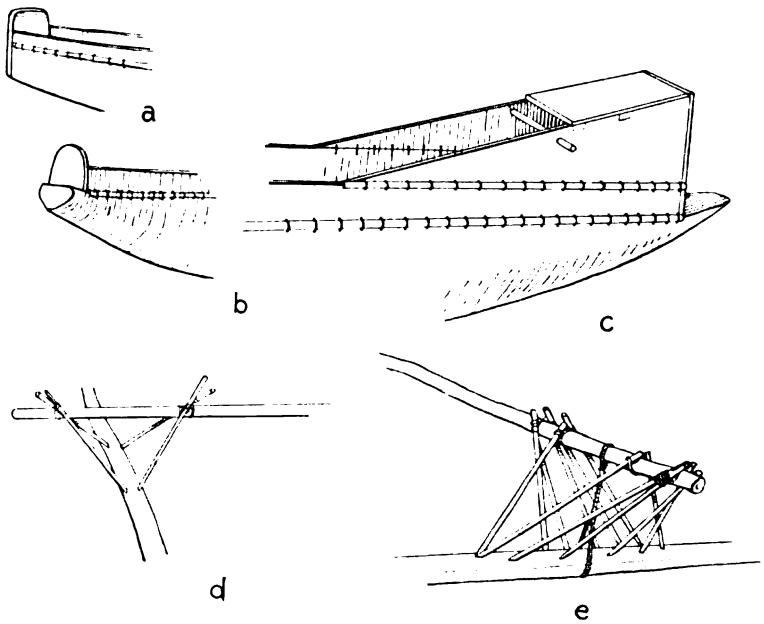

FIGURE 120.—Canoe details, western Papua and Torres Straits: *a*, stern of a Mabuiag canoe; *b*, stern, and *c*, bow of an undecorated canoe (*pe*), Mawata; *d*, *e*, simple and complex attachments, estuary of the Fly (sketched in 1914). Compare *e* with figure 165, *a*.

The steersman stands abaft at the bottom of the hull, and a steering board (*warega*), about 12 or 14 inches broad and about 6 feet long, has been substituted for the paddle of former days. This board is wedged between the side of the canoe and a pole (*raso*) which runs along the side, lashed to it with rattan. The *warega* is always held on the lee side when the canoe is under sail, and is shifted from side to side each time the craft tacks about. When the canoe is going to windward a *warega* is fixed inside the *raso* farther forward, to serve as a lee-board; such an arrangement existed in the old canoes which were steered by a paddle. The *warega*, or a paddle, is sometimes pushed through one of two holes, 12 inches long and

some 2 inches wide, in the center of the platform amidships and just outside the sides of the canoe. When the wind is aft two steering boards are used, one on each side of the vessel at the stern.

The outrigger is double with two booms (*tugu*): fore boom, *eburugabo tugu*; aft, *wapu gabo tugu*. They are 36 to 40 feet long and 6 feet apart and are tied to the top of the washstrakes. The float (*harima*) (Riley gives *sosome*, which is the name for *Hibiscus*, of which wood the float is made) is very much shorter than the hull, its length being generally equal to about twice the distance between the booms. Usually the float is fairly thick in its central half, whereas the ends beyond the attachments are generally decidedly thinner and taper to blunt points; the fore end has frequently an upward rake.

The attachment appears to be normally composed of two pairs of stick connectives (*harima-pata* or *piu*). The sticks of each pair converge over the boom but rarely cross right over it (as in fig. 120, *d*), or they may be parallel; each pair to a variable extent diverges from the other, as in Torres Straits attachments. Variations, however, occur which are similar to the attachments found in the Fly estuary. Landtman points out that the nomenclature does not seem to have been strictly established; some informants called the booms *piu* and the sticks *tugu* or *pato*. I can confirm this statement, as I made repeated inquiries in Kiwai where the sticks are called *tugu*. Attached to the center of the booms is a platform; that of a small canoe is called *taratara*, that of a large one, *motee* (Riley calls it *patora*). The *motee* is provided with lateral crates (*kusi*) for holding gear; they project about 18 inches beyond the sides of the hull. Thwarts are called *tutu*. The cavity (*peniro*) of the hull may be provided with crossed struts (*doirome*). The masts are stepped in a shoe (*hawambu*, "sail root").

For the old sails of *tiro* mats, plaited *hawa* mats of the old Torres Straits type were substituted. Nowadays a European rig of mainsail and foresail is carried. There is no jib. No canoes are now rigged with the obsolete mat sails, but in 1914 I was able to procure the services of three old men at Mawata, who in a short time made a model of the ancient rig, constructing it out of pith, leaves, and fiber. This was photographed as it was too frail to bring away. The following account is based on the model and explanatory sketches:

The model was provided with a double outrigger, three high oblong sails (*hawa*) in the bow, a board (*warega*) on the starboard bow to serve as a lee-board, and another *warega* on the starboard stern to represent the steering-board. At the stern were obliquely projecting, paired, notched sticks (*wapu guregure*) and a central one (*wapu meme*) which in the original would be provided with a fringe of shredded leaves along its length; it slanted forward and was surmounted with a crescentic piece called *baidam sano* (shark's tail). Stern ornaments of this kind were characteristic of the old Torres Straits canoes.

There were two somewhat divergent masts in the bow (*hawanua* to port and *karasi* to starboard) which were kept from diverging more from one another by a loop of rope (*ivi*), the ends of which were fastened to the starboard mast while the loop passed round the port mast. On the port side a pole (*gawa oti*) projected horizontally from the bows. A rope (*gawa ivi*) passed from the end of the port mast to the end of the *gawa oti* and was fastened to the end of the fore port boom (*eburugabo tugu*) of the outrigger. A second rope (*hawanua ivi*) passed from the end of the port mast through three grommets (*hageu ivi*), each of which was attached to the port side of a sail (*hawa*), and passing around the base of the fore port boom was attached to the base of the aft port boom (*wapogabo tugu*). Formerly each sail was supported along its long edges by two spars (*tago*) to which it was secured by skewers; the grommets were lashed to these spars. Three port struts (*tago*) projected upward and forward at regular intervals from the gunwale of the port washstrake (*bodo*) in front of the outrigger. The *hawanua ivi* passed through a slit cut in the end of each of these struts, the free end of which propped up the port edge of their respective sails at the spot where each grommet was fastened on the sail. A third rope (*karasi ivi*) was attached to the end of the starboard mast or *karasi*, passed through the starboard grommet of each sail, and was fastened to the base of the fore starboard boom (*eburugabu tugu*). There were two struts behind the middle and aft sails; these were stepped close to the stepping of the two masts and leaned to starboard, their ends reaching respectively to the grommet of the middle and aft sail. Canoe masts were stepped in a shoe (*hawa mabu*, sail root) in the cavity of the hull. As might have been expected the rig is identical with that of the contemporary canoes of Torres Straits. It may safely be assumed that the old sailing canoes of the estuary of the Fly were rigged in the same manner.

Sir William Macgregor (1893, p. 48) says: "The Mawata people have developed the sailing powers of canoes in a most intelligent and surprising manner; they have their sea-going canoes now all schooner-rigged with canvas sails." The same development had occurred in Torres Straits, before my first expedition in 1888, where it was certainly due to the influence of Europeans, and it is more than probable that the Mawata people followed the example of the progressive islanders as they had previously done in other matters. (See also Beaver, 1920, pp. 76-77.)

In 1914 at Mawata there were also some small canoes (*sobope,* small canoe) with single outrigger and without a washstrake. In these the float was usually longer and more slender than in the large canoes. They generally had the attachment described above, but in one canoe an attachment consisted of the normal arrangement with the addition of one pair of central sticks which converged over the boom; the other attachment had two pairs of central sticks and four divergent pairs of convergent sticks, thus showing Kiwai influence.

Small canoes with a single outrigger are used all along this coast for short trips from place to place and for going up the rivers. (See Haddon, 1912, p. 207, pl. 39, fig. 1.) Though the Binaturi is fairly wide at its mouth the people never travel up the river in their double-outrigger canoes. In former times the double canoes were confined to Torres Straits and now, where there are canoes with double outriggers along the coast, canoes with single outriggers are used as well.

Simple dugouts (*tatagu*) without washstrakes or outrigger are employed on the creeks and small rivers. The *pei ere* which is frequently used in creeks is really a large piece (*ere*) of the side or bottom of a canoe.

The same canoe terminology appears to extend from Mawata eastward and up the Dudi coast to Dawari.

If tradition may be accepted as evidence, it seems that: 1, the original craft was very rude and consisted of a solid log, a double outrigger, a triangular pandanus-leaf sail, and a steering board; 2, a dugout was introduced and fitted with a single outrigger and central platform, a balance pole, several sails of the old type, an *upa* or *gope* at the bow, and a steering paddle; 3, the double outrigger was copied from Torres Straits for the large canoes together with washstrakes and breakwaters, oblong plaited mat sails, and a steering board; 4, European rig of mainsail and foresail has become universal.

It is interesting to find that with the exception of a slight variation in the attachment of the booms to the float, the original craft corresponds very closely to that described by Neuhauss (1911) from Sialum, Huon Peninsula (fig. 171, *a*).

It appears that the large canoes are not made at Mawata or Turituri, or in the southern and eastern parts of Kiwai. They are made at Wiorubi (northeastern side of Kiwai); Paara or Sumai, and Auti (northwestern Kiwai); and in Dudi, which is the mainland of the right bank of the estuary. They are made also on Waboda, an island northeast of Kiwai, and on the left bank of the estuary at Manawiti (Manouette), and at Dibiri village on the coast, whence come the most famous canoes. Near the mouth of the river on the left bank, Chalmers (1903, p. 123) saw quite a hundred large canoes which were for sale; they were covered with coconut leaves. The manufacture of canoes at Gowaburai (Gauoarubi of Macgregor, 1897-a, p. 48), west of the mouth of the Segaro River, belongs to this center. Landtman (MS. and 1927, p. 215) says that there was almost constant warfare between Kiwai and Waboda; canoes were raided in war time, but in peace times the Kiwai men bought them. The trade became so important that it put a marked restraint on hostile excesses.

A. H. Jiear (1905, p. 70) gives a detailed account of the canoe traffic and the prices charged, as do Landtman (1927, p. 213) and Beaver (1920, p. 164).

Estuary of the Fly

There is no essential difference between the large sailing canoes with double outriggers of the Fly estuary and those of Mawata. The smaller canoes are simple dugouts without strakes; the hulls slant upward gradually at each end to form a long horizontal point, and they have but a single outrigger. These alone are employed to about 70 miles up the river. In the following list of terms the Kiwai name is given first; those in parentheses are of the islands east of Kiwai, which are similar to those of the estuary of the Bamu: canoe, *pe* or *pei* (*peri*); small canoe, *sobo pe* (*tataku*); boom, *piu* (*tupu*); connective sticks, *tugu* (*tugu*); float, *sarima* (*totoka*). More than once I was given the word *sosome* for float in Kiwai; this is the name for *Hibiscus tiliaceus*. One often finds that an object has the same name as the material from which it is made. I was told that the floats were also made of *warakara* (*Erythrina*, coral tree) which has a very light spongy wood. *Piu* is the name for mangrove. Struts are called *tutu*.

Landtman (1927, p. 210) gives illustrations about which he writes:

"Both ends of the canoe projected well above the surface to keep out the water. In olden times neither end was closed in by means of any special structures, as in the present day. A shield (*upa*) of basket-work was, however, placed in the bow, supported by stays and decorated with leaves," one purpose of which is said to have been to prevent the waves from beating into the canoe (fig. 121, *a*). In other canoes the people rigged up a *gope*, or board, deeply carved with a human face and other designs; the carving faced the interior of the canoe. As *gope* were at intervals hung outside the main entrance of the long-houses to keep off illness, we may conclude that they and the *upa* also served to bring good luck to the canoes. Landtman adds: "Both the *upa* and *gope* are still commonly to be seen in Fly River canoes."

The booms, always two in number, are very long. The float is short in the large sailing canoes, but long in the smaller craft and may be as long as the hull. Usually in the large sailing canoes the attachment consists, as at Mawata, of two pairs of parallel or convergent sticks, one pair diverging from the other; in some canoes there may be added a pair of central sticks. In the smaller canoes there are typically for each attachment four pairs of oblique sticks which converge over the boom; the two pairs on one side of the float diverge widely from those on the other side. Usually in the median line of the float there is an additional pair of sticks (central sticks) which are inserted into the float far apart and converge over the boom (fig. 121, *a*); or there may be two pairs of these, thus making a total of 12 sticks for each attachment (fig. 120, *e*); occasionally there is a vertical lashing in the center of an attachment.

The outrigger apparatus is amidships in the large canoes and the booms are not far apart. In the smaller canoes the booms are farther apart and the apparatus in some canoes is placed much nearer to the bow than to the stern.

Very occasionally in the estuary there is a stringer connecting the two booms directly over the float to which it is connected by a vertical lashing in the center and an oblique one at each end. An arrangement of this kind is common in Indonesia and occurs in northern Melanesia, but I do not know of it elsewhere in Papua.

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At Urio, or Purutu Island, I saw a small canoe (*tataku*) with a single outrigger, two booms, and an attachment of the Kiwai type, without central sticks. The hull was 19 feet 7 inches long, the booms 8 feet 8 inches long, and the float 21 feet 4 inches long. There were also canoes with double outriggers, identical in all respects to the old Torres Straits type, except for the modern mast. One of these was 30 feet long with a float 8 feet 4 inches long, which was 13 feet 6 inches distant from the hull. This canoe cost 4 knives, 4 tomahawks, 2 pieces of calico, and 10 cowry shells (*porto*). The long paddles have an elongated well-shaped blade; the top of the handle is a flattened oval with a carved human face.

At Tirio, on the right bank of the Fly, some 35 miles up the river at about 143° 4′ E., all the canoes (*gwawa*), when I saw them in 1914, had a single outrigger with two booms (*gugububu*); the attachment to the float (*sarima*) was most often the typical Kiwai one with a single pair of central sticks (*iatu*), but some had two pairs.

I have been informed that from beyond Dawari, on the Dudi coast, and up the Fly River as far as Daumori (Domori) Island and the neighboring north bank, the canoe terms are: canoe, *pe*; boom, *komori*; sticks, *ha-hawa*; float, *harima*. Thence up the river as far as Aduru, the terms are: canoe, *kwa-wa*; boom, *wawa*; sticks, *asau*; float, *saba*; and from Weridai (Tagoto) as far as Karama, below D'Albertis Island, they are respectively: *kouk, kisuk, gaba tutu,* and *sarim.*

The estuary natives usually sit when paddling, but stand if they are in a hurry; this seems to have been done formerly in Torres Straits. The usual bailer (*garo*) is the coconut spathe.

Macgregor (1897-b, pp. 55, 56) says, "With small rods and twine they rig up little oblong sails in the estuary, for going before the wind. Between the Fly and the east end of the Gulf of Papua the sail seems to be quite unknown."

There does not appear to be any tradition in the estuary of the Fly concerning the origin of the simple dugout, but its history may have been forgotten, as the dugout is found throughout New Guinea. Neither is there any recorded tradition of the origin of the single outrigger canoe of that region. It appears to me to be extremely doubtful whether it is in any way directly related to the existing single outrigger canoes farther east in Papua. The attachment is essentially similar to that of the Torres Straits canoes, but there are more sticks. I can only conclude that it belongs to the same cultural drift as that which reached Torres Straits, and that a single outrigger replaced the double one for greater convenience in river navigation; perhaps this was copied from Torres Straits. A change of this kind is widespread, even as used in navigation on the open sea.

In Kiwai the name for the float is *sarima* and a short distance farther up the Fly and along the Daudai coast as far as Mawata it is *harima*. In the western language of Torres Straits we have *saima* or *sarima,* but in the eastern language it is *sirib,* for which I can find no parallel. It is thus evident that the name for the float of the outrigger among the Kiwaians and in western Torres Straits is a word that is common to the Austronesian group of languages; it could have arrived direct from Indonesia, but it is almost certain that it came from Indonesia by way of the extreme west of Melanesia. The structure of the Torres Straits and Fly River outrigger disproves a direct Papuo-Melanesian origin, though there is little reason to doubt that a double-outrigger canoe with a float called *sama,* or some such term, arrived at an early date from western Oceania. If this be admitted, it seems probable that the single outrigger of the Fly estuary was a modification, presumably made to suit local conditions.

Estuary of the Bamu

As might be expected, the canoes of the western portion of the estuary of the Bamu and the adjacent mainland resemble those of the Fly estuary, but divergencies occur in the eastern portion.

The canoes (*peri* or *peeri*, the native names, were obtained at Waradirio on the mainland) of the estuary of the Bamu are simple dugouts without a washstrake (fig. 121, *b*). The bow has usually a more decided rake than the stern and is more or less open in front; the stern is cut off squarely so that it looks like the cutting edge of a gouge. Sometimes each or only one end is plugged with the dense sticky mud of the district to prevent water from coming in. Struts are called *tutu*. The outrigger is single with two long booms (*tupu*) placed very far apart. A canoe of this type seen at Murray Island (Haddon, 1912, pl. 25, fig. 1) was probably obtained from the estuary of the Bamu.

The float (*tatoko* or *totoka*) is a simple pole about as long as the hull and sometimes crooked. The attachment of the larger canoes observed at Waradirio consists of 16 sticks (*tugu* or *koro*); on each side of the float six sticks are inserted at fairly regular intervals, three of these converge over one side of the boom and three over the other. Each set of six sticks diverges widely from the other so that looked at from above they appear like two fans, the apices of which are far apart on the boom (fig. 121, *b*). Two pairs of central sticks are inserted into the top of the float beyond the other sticks; the sticks of each pair meet over the boom, but the pairs diverge from each other. The boom is frequently connected with the float by means of a single vertical lashing in the center of the attachment. In smaller canoes there are only four sticks on each side, the central sticks may be present or absent, but the lashing is a constant feature. The Waradirio attachment is the most complex in this region but all intermediate forms between it and the simple Torres Straits-Mawata type are seen in the estuary of the Fly.

There is often a central platform (*patora*) resting on the aft boom only. Two longitudinal poles are laid over the aft boom and on short thwart poles on the edges of the dugout; transverse poles are lashed to these and they are secured by a longitudinal pole lashed over their ends. The platform projects over both sides of the hull and on the off side it may be provided with a railing (*motogidio*) which slants upward and outward and is of similar construction to the platform (fig. 121, *b*).

At Wododo, on the north side of Dibiri which is the most southerly island of the estuary of the Bamu, were canoes of the local type, with two or three divergent pairs of converging sticks on each side of the float, the two pairs of convergent central sticks being either present or absent. A simple platform was sometimes added. A triangular, cane framework (*kupe*, the *upa* of Kiwai) was erected in the bow of some canoes, ostensibly to keep out the spray, but as there was great difficulty in buying one, it is evident that they have a magical significance.

Beaver (1920, pp. 226, 228) writes that the most famous canoes in the west are said to be made by the tribes of the northern end of Aramia, the large island at the head of the estuary, but the export trade is almost entirely in the hands of the Waboda people. Very large canoes, 60 to 70 feet long, without an outrigger, are found in the estuary of the Bamu. Small single-outrigger canoes are used on the Bamu and at some distance up its affluents, the Wawoi and Aworra; thence they are replaced by rafts. In the western and upper Bamu the men paddle sitting down, while at Buniki they almost invariably stand up as they do farther east.

At Buniki on the east bank near the mouth of the Bebea, the northerly mouth of the Bamu, very few canoes were seen in 1914. One or two were rudely made dugouts cut off square at the stern so as to be quite open behind and without an outrigger. One had a single outrigger, one boom of which had two pairs of parallel sticks which diverged slightly from each other, each pair being reinforced by an oblique stick. The other boom had, on the outer side of the float, one pair

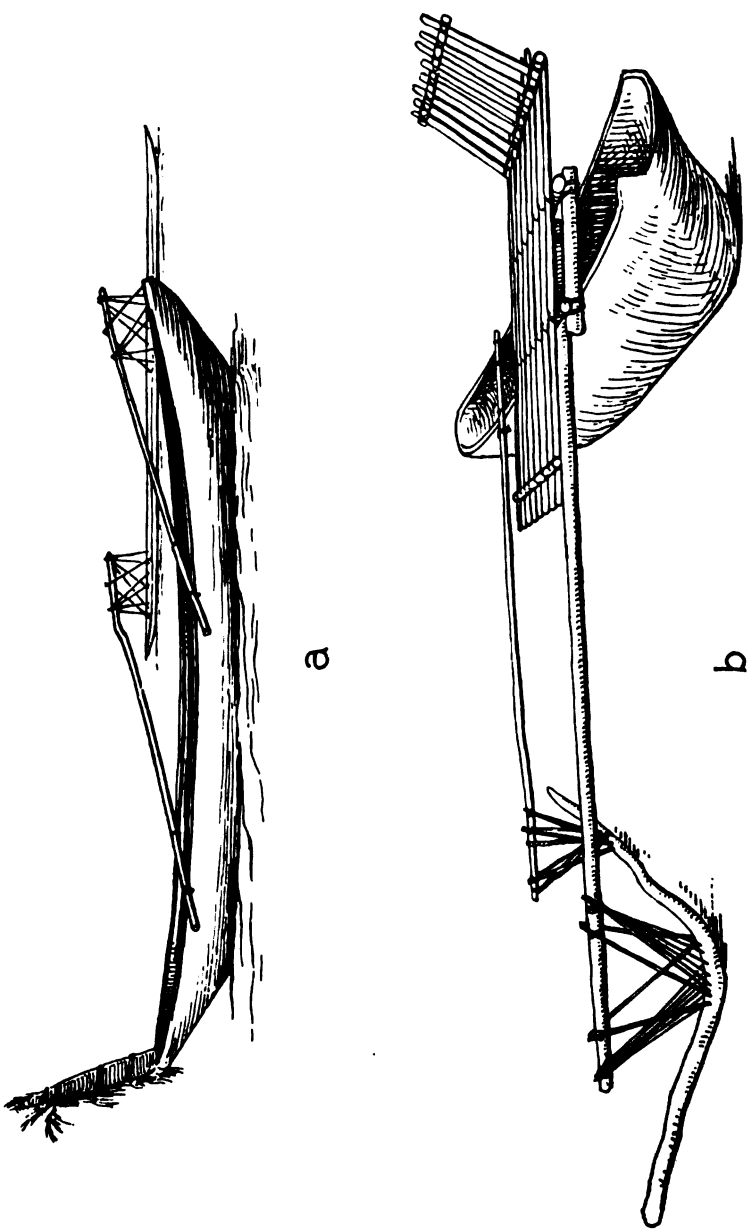


FIGURE 121.—Western Papuan canoes: *a*, *pe* with bow shield of basketwork (*upa*), Sumai, Kiwai Island, estuary of the Fly (after a photograph by Dr. Gunnar Landtman); *b*, *peri*, forcshortened, Waradirio, estuary of the Bamu (after a photograph by Kathleen Haddon, 1914).

of convergent sticks and on the inner side two pairs; the two sets were divergent.

One canoe at Buniki was a very small dugout, but had pointed closed ends, the bow had a greater rake than the stern and was more definitely pointed; thus the hull was quite different from the usual dugout of the Bamu district. The two booms of the single outrigger were lashed directly to the float, but there was a small peg inserted into the float on the outer side of each boom and lashed to it; evidently its purpose was to prevent the lashing from shifting, as occurs also in the Archer River type of north Queensland. This is the only direct attachment as yet recorded from any part of New Guinea. Inquiries made at the time and subsequently have led to the conclusion that it was an individual occurrence of no special significance, and probably merely a temporary contrivance. Unfortunately we were unable to communicate with the man in this unique canoe. From Buniki eastward the use of outriggers ceases till the area of the Gulf tribes is reached.

THE PAPUAN GULF

The canoe-making tribes of the Gulf district are, from west to east: the Moreaipi at Orokolo and Vailala; Uaripi at Uaripi (Kerema group); Milaripi, from Silo, east of Cape Cupola, to Wamai; Kaipi at Kaipi (Karama); Toaripi ("Motumotu") at Toaripi; and the Moaripi at Lese, Miaru, and Jokea. All the canoes of these tribes are much alike. This information was placed at my disposal in the form of manuscript notes made by J. H. Holmes about 1902.

The traditions of the Ipi tribes relate that they came from the upper waters of the Purari and southern slopes of the Albert Victor Range (Holmes, 1903, p. 126; Haddon, 1920-b, p. 261). It is hazardous to generalize from insufficient data, but it seems that provisionally the Ipi tribes may be regarded as being a late coastward movement from the mountains in which the Purari rises. Holmes considers that the Moreaipi settled on the coast about 1800 A.D., or perhaps somewhat earlier, whereas the Toaripi did not reach the sea till about 1850. These dates appear to me to be much too recent. If the ancestors of these tribes had a canoe, it would certainly have been a simple dugout without an outrigger. A canoe of this kind requires great skill in balancing, so the substitution for it of a double canoe, or an outrigged canoe, is quite natural along a coast which is notorious for the extent and strength of its ocean rollers and breakers. If this be so, we must look to the east for these innovations, though the type of outrigger is unlike any other in New Guinea. Furthermore, it would be remarkable if these tribes should have become expert fishers and have developed a coastal trade in so short a time.

Outrigger Canoes

From personal knowledge I can describe only the Orokolo outrigger canoes (*iloki* or *iroki*) (fig. 122):

Both ends of the hull are pointed; the bow (*oropa*, in front) tapers from below upward much more gradually than the stern (*hiha*, a boil), but the whole upper edge of the hull is horizontal. There is no washstrake, though on each edge of the hull there is a thin pole, or sometimes two poles one above the other (*pere* or *pele*), over which the outrigger booms are lashed. The ends of the thwarts (*huhu*) either lie on the gunwale of the hull and below the single pole, or between the two poles. There are often transverse struts (*havi*) across the hold. The bow and stern are usually carved in a fairly simple manner, typical forms of which are shown in figure 124, *a-e*, though some are less elaborate; usually the two ends are similar. A drawing by F. E. Williams (made in 1932) of the upper surface of an old canoe prow shows simple carved and painted designs on the fore end and a human face between the lateral

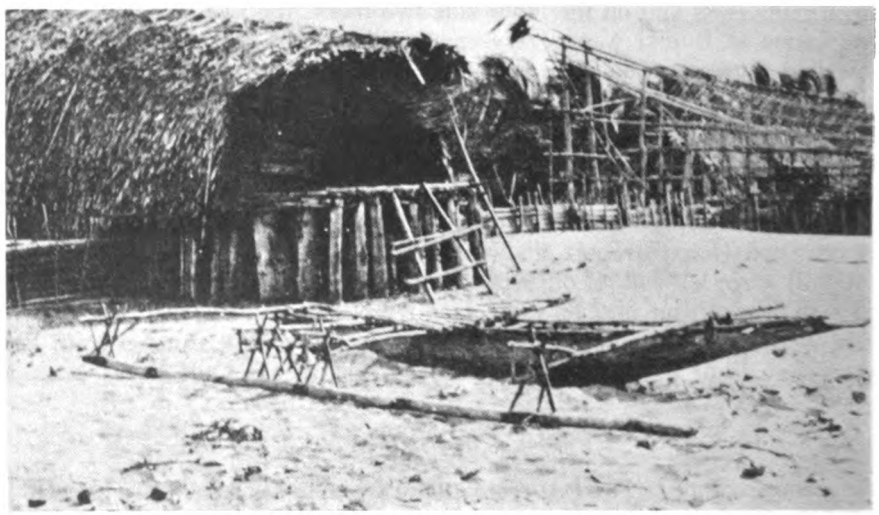


FIGURE 122.—Outrigger canoe (*iroki*), Orokolo, Papuan Gulf (photograph by Kathleen Haddon, 1914).

wings. Probably decoration of this kind was common formerly. The lateral wings of the carving are sometimes perforated by one, two, or three pairs of square holes. The under side of the carved ends, usually only the stern, is often furnished with a row of a variable number of downwardly pointing flat triangles (*kaokao; kao,* tooth). Occasionally there is at both bow and stern an erection (*pepe kola*) (fig. 123) consisting of a curved stick slit at the free end, which bears some resemblance to the neck and head of a darter (*Plotus*) or similar bird, or even to a snake. The erection is ornamented at intervals with bunches of fiber. On one I saw a small bag suspended a short distance behind the slit or "mouth". The Rev. H. P. Schlencker informed me that *pepe* is the term now used for a flag, and that *kola* is a tree. The fringes are called *ma'e poporo* (*ma'e* is a woman's petticoat); apparently these are only put on new canoes as ornamentation (*moupa*). Schlencker suspects that the bag was connected with sorcery, but probably it was merely a charm. Williams gave me the name *biha* for stern.

FIGURE 123.—Outrigger canoe (*iroki*), with a *pepe* at each end, Orokolo, Papuan Gulf (photograph by F. E. Williams, 1932).

The outrigger is always single and in the great majority of canoes has five booms; of these two are near the ends, the other three being close together about the center (fig. 122). One canoe had only two central booms, as had the few canoes seen at Baresi on the Alele River and on the Aivei farther west. The booms (*laka*, also the word used for the branch of a tree, *ndaka* at Arihavi) rest on the *pere* and are lashed to the hull. The free end is forked, as the boom is made of a branch or sapling from which a branch springs at an acute angle; usually the boom is so placed that the branch limb of the fork is underneath, but there is no regularity in this. Frequently the tips of the fork are connected by a cord lashing (*lava*), which is the name of the vine from which it is made; the lashing of the sticks to the boom is also called *lara*. The float (*milo*, *biro* or *bido*) is a slender pole of about the same length as the hull. The attachment consists of a pair of crossed sticks (*haura; hoda* at Arihavi); the upper limb of the fork of the boom rests on the crossing, while the lower limb passes under it. The sticks are made of the hard rind from the trunk of the sago palm. Frequently a third stick (*haura*) arises from the float beneath the crossing and passes obliquely upward and inward (toward the hull). Usually the *haura* is lashed to the fork; rarely it is long and is set so obliquely as to be fastened to the boom some distance from the fork; Schlencker says that it is put on to strengthen the attachment when it becomes rickety. The central booms project some distance beyond the off side (*hariva-ukai*) of the hull and support a small platform (*haha*) of longitudinal sticks. The outrigger side of the hull is called *milo-ukai*. The thwarts or seats for paddlers are called *huhu*, and paddles, *kaita*.

Holmes (1924, p. 100), speaking in general terms, says: "The float was usually about two-thirds of the length of the dugout; it was of lighter wood; its fore and aft ends were bevelled slightly upwards, and its surface was generally a little flattened." His further description does not add anything new—he says this type of canoe was used by the shark-fishers of the Ipi tribes.

Canoe-making is not practised by all the families of a tribe. The difficult part is relegated to old and expert men. Holmes can not say whether it is a hereditary occupation, but he knows that there are only a few men in each tribe who are considered expert enough to hollow and shape a canoe from the log. He says in his manuscript notes:

> These men still (about 1902) do quite a large part of their work with stone adzes; when this is done and the outside and sometimes the inside of the canoe has been charred with fire, the rest of the work, the lashing, etc., is undertaken by younger men. There does not seem to be any fixed period for canoe-making. The Ipi tribes do not carve their canoes, beyond an attempt here and there; the carving is characterless.

The following are the measurements of a typical canoe: length, 21 feet 6 inches; width in center at the gunwales, 11.5 inches; width at center of hull, 16 inches; distance of first boom from bow, 41 inches; distance of last boom from stern, 18 inches; length of float 21 feet 11 inches; distance of float from hull, 50 inches; length of platform, 53 inches; breadth, 33 inches. Measurements of another canoe: length, 20 feet; distance of float from hull, 5 feet.

Holmes says (MS.) that the outrigger canoe is in daily use, often being in the charge of women and children. It is employed for fishing, going to the gardens, and for all sorts of journeys by water. The outrigger is generally on the port side. The canoe is propelled and steered by paddles (*kaita*) about 4 feet 6 inches long; the width of the blade is from 10 to 12 inches.

Photographs of Vailala River canoes (Carne, 1913, pls. 5, 19) show that they are precisely like those just described. E. W. P. Chinnery has given me sketches showing the same construction. A thin pole of wood is lashed on to the gunwale on each side of the hull, on which are laid the seats. Over these is lashed a stouter pole, upon which the booms are lashed. There are only two central booms. Neither of these sources shows the additional stick at the attachments nor a lashing between the forks of the boom.

A general account of the canoes of the Gulf Division is given by Bastard (1922, pp. 70-79); he recognizes 10 districts from west to east. I have added the names of the tribes according to Holmes (1903):

1, Orokolo tribe (Moreaipi), Arihava to Aivau, about one mile east of Vailala River; 2, Muru villages, inland from Orokolo; 3, Kiri tribe, Keuru group of villages, 7 miles east of Vailala [this is the Haura tribe of Holmes (1903, p. 132) which has made its appearance on the coast only within the past few years; he says Keuru is the Motuan for Hai, which village is about midway between Vailala and Kerema]; 4, Kerema tribe [according to Holmes, "The Uaripi tribe claim precedence of arrival at the coast, having come over the Albert Range of mountains and down the Opau Valley to the sea in Kerema Bay"]; 5, Opau, behind Kerema Bay [probably a split from the Muru at a not very remote date; for another version see Lambden (1925, p. 18)]; 6, Lorabada tribe, Kerema Station to east side of Cape Cupola; 7, Newo tribe, Silo, about 3 miles east of Cape Cupola to Koaru, about 3 miles west of Tauri Delta [Milaripi and Kaipi]; 8, Movi-avi, Savaiviri, and Papala on the Tauri [a branch of the Toaripi settled at Eavara, which is their name for the village—Holmes says Mobiabi or Movi-avi is the Motuan name]; 9, Toaripi, coastal villages from western side of the Tauri, including Lese and Biaru, to Jokea [the Toaripi live at the mouth of the Lakekamu; the almost extinct Moaripi live at Moaripi (Lese), Miaru (Biaru), and Fave (Jokea)]; 10, Oiapu [the Lepu live at Oikapu (Oiabu)] about 10 miles west of Cape Possession.

Of the above the Muru (2), being an inland tribe, have only simple dugouts (*alakaita*) similar to those of the Purari Delta. Outrigger canoes according to Bastard are made only by the Moreaipi (Orokolo, 1), Haura (Kiri, 3), Lorabada (6), and Milaripi and Kaipi (Newo, 7); they are all of the same type as that of the Moreaipi. The upper fork of the boom, however, in the Milaripi and Kaipi canoes does not rest on the crossing of the connectives but is tied outside at the point where they cross. The small canoes (*ala-a*) of the Lorabada are poorly constructed and are used only on calm days for inshore fishing. The dugouts are about 12 feet long, and 17 inches deep; the thin forked booms are about 5 feet long, there are one at each end and two in the middle. The float is called *biko*: the paddle, *kai-ako-o*. Bastard (1922, p. 75) says: "The Lorabada people have only of recent years come down to the coast and did not, apparently, have canoes previously", hence their name for the canoe and they evidently adopted the Milaripi canoes. The canoes (*iloti*) of the Newo tribe (Milaripi and Kaipi, 7), are from 12 to 18 feet long and from 16 to 21 inches deep. There are four booms (*elealaka*) about 5 feet long. The crossed connectives (*nakaitoro*) are inserted into the float (*milo*). The *iloti* hold up to four men.

F. E. Williams, Papuan Government Anthropologist, has recently sent to me the following information about the outrigger canoes of the Gulf of Papua:

Simple dugouts (*arakaita*) of the Purari Delta type are used in the creeks behind Arihava, the westernmost village of Orokolo. Thence to Vailala, the outrigger canoes (*iroki*) are of the Orokolo type already described, as are those of the Keuru villages (fig. 124, *f-i*) which are also called *iroki*.

The Keuru [Kiri or Haura, 3] are really an inland people who have come fairly recently to the coast from the middle Vailala River and have copied the canoes of the Vailala coastal villages. His sketch [fig. 124, *f*] shows a horizontal strut in the hold and two gunwale poles on each side between which the paddlers' seats (*papa*) are wedged. The boom (*laka*) rests on the upper poles and a platform (*haha*) of longitudinal and transverse poles is fastened on the booms. The float is called *biro*, connectives *karira* (fig. 124, *g*). Bow and stern carvings are shown in figure 124, *i*, *h*.

In Kerema Bay there are extremely few outrigger canoes; double canoes are employed instead.

From Cape Cupola to the Lakekamu River the construction and carving of the outrigger canoes are identical in the villages of Silo, Wamai, Karama and Koaru—the Newo tribe [7] of Bastard.

According to Holmes (1903, p. 134), Levu (Silo) and Milaripi (Wamai) belong to the Milaripi tribe (M) and Kaipi (Karama) and Koaru to the Kaipi tribe (K). Williams gives the following terms:

Canoe, *eroti*, M, *kauma*, K; hull, *pao*, M, K; bow, *haraha*, M, K; stern, *evo'e*, M, K; upper carving fore and aft, *kirori* M, K; under carving, *harau*, M, K; struts inside hull, *hami*, M, K; gunwale pole, *keke*, M, *soafe*, K (*pere* at Koaru); boom, *bere'a*, M, *laka*, K (*nakai* at Koaru); stringer, *soafe*, M, K (*horu* at Koaru); platform, *fosa*, M, K; connectives, *saukwa*, M, K; float, *bizjo*, M, K; bailer of coconut shell, *ko'u* M, K.

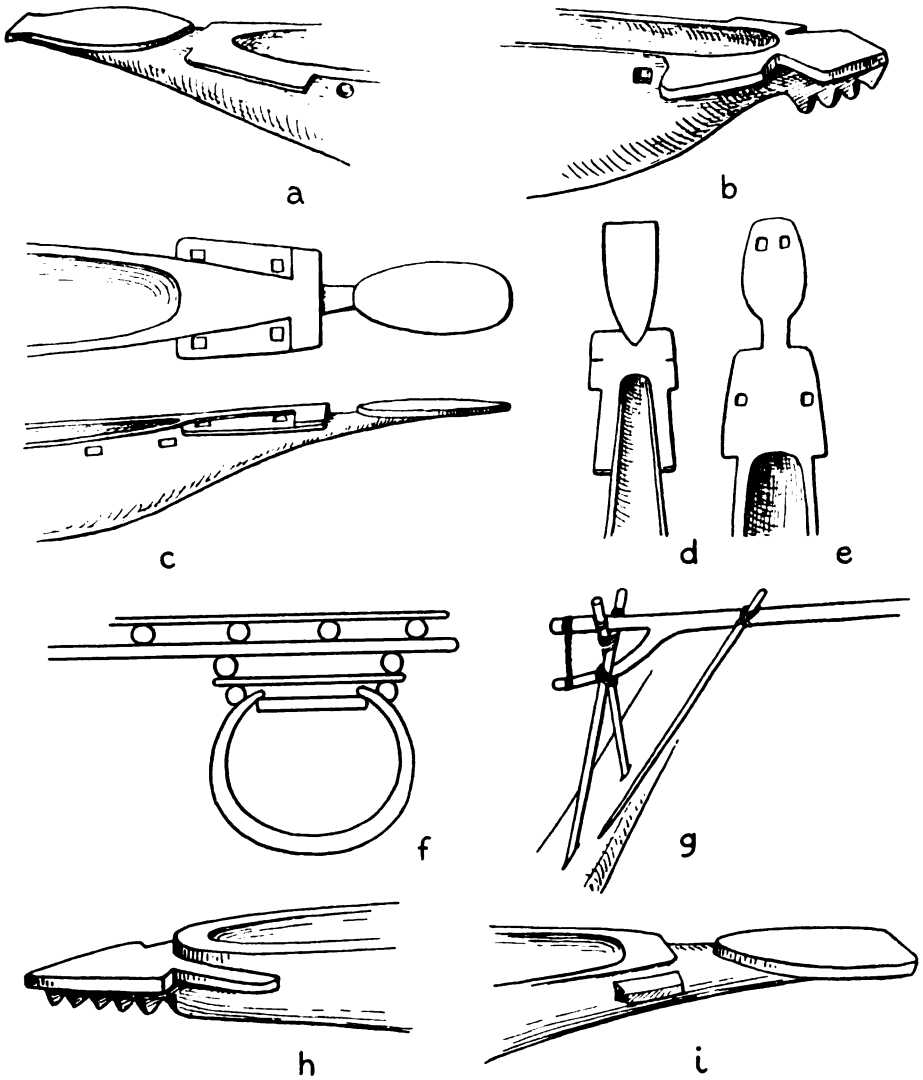


FIGURE 124.—Details of Papuan *iroki*. Orokolo: *a*, bow, *iroki-oropa*; *b*, stern, *iroki-hiha*, Arihava (after F. E. Williams); *c*, upper and side views; *d*, upper view of a bow; *e*, upper view, both ends similar (sketch by A. C. Haddon). Keuru: *f*, diagrammatic section of hull, showing boom and platform; *g*, attachment; *h*, stern; *i*, bow (*f-i* after F. E. Williams).

According to information sent to me by F. E. Williams there are two kinds of Kaipi outrigger canoe:

1, The *kaua* (fig. 125, *a*, *b*), which has not previously been recorded, is small, about 12 feet long; the bow and stern are similar with dentate carving underneath. Two or three very thin poles (*pere*) of mangrove saplings are tied on to the gunwales. There are three booms (*keki*), two of which are close together near the bow; on these is placed the gear for shark-fishing; the paddler sits in the stern. There is no platform. The float (*mihyo*) is as long as the hull; the attachment consists of undercrossed sticks (fig. 125, *a*). These canoes are used at sea, especially for shark-fishing.

2, The large outrigger canoe used for communal fishing with a seine net may be more than 40 feet long. The float is in the form of a small dugout—"it is not a mere float". Williams made sketches at Koaru (fig. 125, *c*, *d*) of the bow and stern of the only two realistically carved canoes that he saw. According to R. G. Speedie the most common type of bow and stern carving in the area is that shown in figure 125, *e*, *f*. The carving of the upper surface is called *kirori* and the toothlike carving underneath is called *harau*.

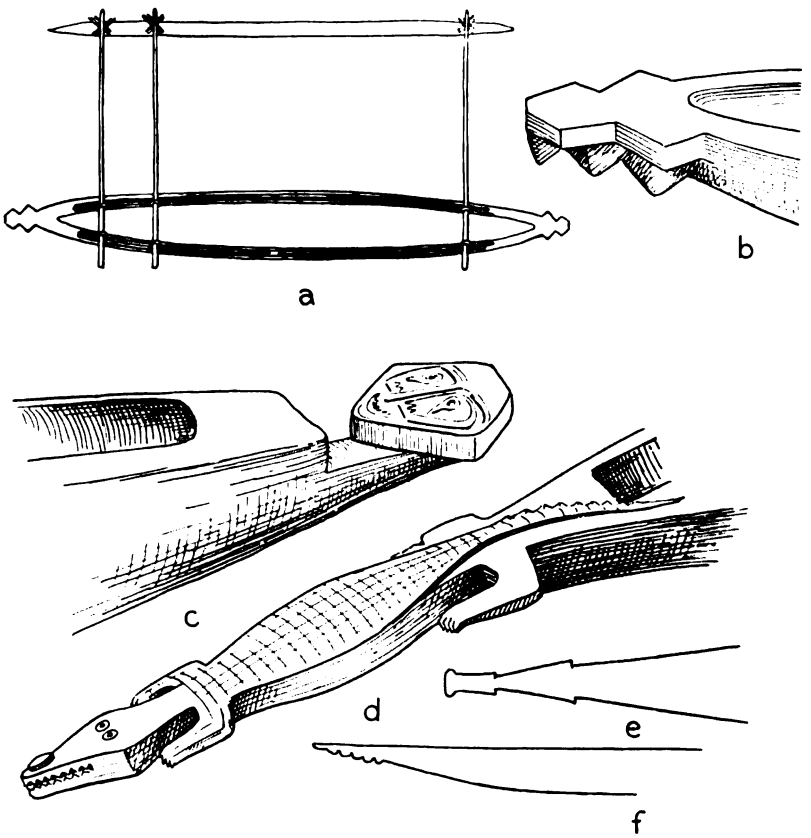


FIGURE 125.—Outrigger canoe (*kaua*), Koaru, Gulf of Papua: *a*, plan; *b*, end carving, both ends are similar; *c*, stern (*evoe*) of a canoe 40 feet long; *d*, bow of a canoe 45 feet long, crocodile is more than 5 feet long; *e*, *f*, upper and side views of the most common type of fore and aft carving (*a-d* after F. E. Williams, *e*, *f* after R. G. Speedie).

Mr. Speedie informs me that the two central of the four booms are not always exactly amidships. In the smaller canoes which are 10 to 12 feet long, they are often placed three parts of the way forward or even more, to allow room for the paddler aft and to give better balance. The longer the canoe, the closer to the center are the two central booms. The smaller canoes are handled by one man, and the outrigger is nearly always to starboard. Two men usually manage the larger canoes, which are 14 to 20 feet long, and in these it can not be said that the outrigger is placed to port or starboard. In each type of canoe there is a defined bow and stern which is usually determined by the thin and the thick ends of the original

log, the thick end usually being aft. The attachment in some canoes is identical with that at Orokolo, but often the fork of the boom is lashed to the side of one crossed stick below the crossing. The ends of the forks of a boom are often connected by a rope and the upper ends of most crossed sticks are lashed to the boom at the shoulder of the fork. As at Orokolo there is often a third stick passing obliquely from the float to the boom. In some canoes the float is not immediately beneath the ends of the booms but may be as much as five inches farther from the hull than the extreme ends of the booms; this is said to make for greater stability in bad surf.

According to Bastard (1922) the outrigger canoes have neither side planks nor sail. They are owned individually and the owner generally acts as captain. They are not traded, but complete canoes without an outrigger are sometimes exchanged by the Kerema (4) for partly chopped-out hulls from the Opau (5). There are no ceremonies connected with their making. He states that among the Orokolo (1) and Kiri (3) the elders of both sexes rest on the platform and young women paddle.

Double and Multiple Canoes

The great double canoes (*haruka* of Orokolo) consist of two large dugouts of equal length lashed together with an interval of about 2 feet:

The hulls are of much more massive construction than those of the outrigger canoes; the ends, which are alike, are finished off quite simply. One hull measured 49 feet 5 inches long; in the center the width at the gunwale was 22 inches, at the widest part of the hull, 28 inches, but they vary somewhat in size. Saplings of equal length, their ends flush with the sheer lines of the dugouts, are laid equidistantly across the gunwales and are held rigidly in place by cane lashings passed over them and through holes about 3 inches below the gunwales. On these are laid longitudinal planks, which are usually cut out of old canoes; this continuous, commodious platform or deck extends from the stern to about 3 feet short of the bows. Spaces are left open on each side for the paddlers and steersman, who stand in one of the two hulls. Holmes says that the rowlocks and oars used today on this type of canoe are copied from the white man.

If there is a mast (*auvia*) it is stepped on the platform, but Holmes thinks this too is borrowed from Europeans. He says that the native method is to fasten long mat sails (*eara* or *iala*), which are 10 to 12 feet long and 4 feet wide, to two long poles and to place the lower ends of these poles in the bottom of the canoe when sailing. The sails are furled by rolling them round the poles until they meet in the middle. These large canoes are used for long voyages on the deep sea and for bringing in large quantities of food at feast times (Holmes, MS.).

Neither Holmes nor Schlencker know of any tradition as to the origin of either the outrigger or the double canoe. Holmes (MS.) saw a small double canoe on the upper waters of the Vailala.

Williams informs me that large double canoes were used formerly by the Orokolo for trading voyages as far as Toaripi. Originally they were paddled, later they were rowed with oars, the rowlock being fitted to the platform; the rowing method was copied from whaleboats. Further developments were regular masts and sails, and superstructures for housing the crew and carrying sago and other commodities. These large double canoes are still in use, but are now being supplanted by multiple sailing canoes (*bevaia*) which are copied as exactly as possible from the Motu *lakatoi*. The eastward trade is assuming considerable proportions, though the Gulf people are not yet really expert seamen. Vailala villages sent out 12 or 13 *bevaia* in 1932.

The following information is taken from Bastard (1922):

At Orokolo there are a few double canoes (*iloki*) of the same type as those at Kerema. Multiple canoes of four and five hulls are made for special trips eastward; they have mat sails, and oars (*bara*) are used with a loop of *belowe* vine as a rowlock. The Kiri tribe (3)

to the east do not make double or multiple canoes, but recently two villages have done so, owing to the numerous crocodiles. [Williams says that the experiments of the Keuru with multiple sailing canoes (*bevaia*) are very recent indeed.] The Kerema tribe (4) [the Uaripi] make only double canoes. The dugouts (*iloti*) are of *sofea* (*ilimo*) wood, the transverse poles are called *tora*, in the center of which a platform (*fasa*) is built. The length of the platform is about one third that of the hulls. Canoes are made for 2, 4, 6, 8, and 10 men, but are chiefly of the smaller sizes. Multiple canoes of four dugouts with mat sails, and oars (*bara*) used with a vine rowlock, were formerly made for trips to the east. [Williams is under the impression that these voyages were made in large double canoes.] The Opau tribe (5) also make only double canoes (*iloki*), the largest dugouts of which are 14 feet long. There are six transverse poles (*halu*), one at each end of the hulls and four in the center, resting upon gunwale sticks (*pele*), while similar sticks, also called *pele*, lie over the poles above the gunwale sticks; all are tied with the *ela* vine. In the center there is a board platform (*haka*) about 4 feet wide which is sometimes made of old canoes, but more often of the areca palm. The width between the dugouts is 3 feet 6 inches, and the depth of a dugout is 15 inches; they hold four men. There are no sails, oars, or a fixed steering paddle (paddle, *kai-ie*). The Lorabada (6) have a few double canoes at Ururi. Among the Newo tribe (Milaripi and Kaipi, 7), small double canoes (*nakea-iloti*) are used on the Karama River; the dugouts are about 12 feet long. There are also large fishing canoes (*lahea-iloti*) the main dugout of which is about 30 feet long, the smaller is about 10 feet long; a platform extends from the small dugout to the center of the larger one, and on it a large fishing net is carried; the crew consists of five men. Large sailing double canoes (*saliwa-iloti*) are made especially for long trips. The steering oar is "used fixed with wooden pegs" or thole-pins (*norcketora*). Sail, *loi-ia* or *au-uvia;* paddle, *taika;* oar, *fala.*

On the Tauri River (8) at Eavara (Moviavi) and other villages there are no outrigger canoes, but small double canoes (*iloti-sega*) and larger ones (*iloti-nawaia*) are in use. Multiple canoes (*kakau*) of four or five dugouts are made for special trips to the east. The dugouts are from 12 to 30 feet in length. There is a thin stick (*halu*) over each gunwale upon which the cross poles (*pele*) are fastened. The whole of the canoe is decked with a platform (*susu*) made either of pieces of old dugouts or of the *fai-ia* (*goru*) palm. Paddles (*taisa*) are used in the small canoes, and oars (*fala*), held in a rowlock composed of a loop of *morove* vine, in the larger canoes. There is a fixed steering oar (*tali*) only in the large canoes. Sails (*auwia*) were formerly made of matting, but calico is now being used. The crew consists of from 4 to 20 men, according to the size of the canoe.

Ownership is individual in all the canoes of the foregoing districts (1-8). No ceremonies are connected with them.

At the important village of Toaripi (Motumotu) and at the villages down the coast as far as Jokea (9), only double canoes are employed for local use. Mat sails (*kite* or *au-uvia*) are made from pandanus, but calico sails are now often used. Multiple canoes (*mavai-a*) of from four to seven logs, are made for trading sago to the east. The small double canoes (*olotisaieka*) are used only in the estuaries and rivers:

> The dugouts are from 12 to 30 feet long. A thin stick (*ilitolo*) is laid along each gunwale. Over the *ilitolo* are lashed the cross poles (*olotiholu*) at irregular intervals. On these cross poles above each *ilitolo* is lashed another longitudinal thin stick (*alaripeli*). A platform (*susu*) made of old dugouts is fastened over the cross poles, but not over the dugouts; such a platform may be up to 10 feet in width. A paddle is called *taisa*. There is no fixed steering paddle in the small canoes, but in the large ones an oar (*fala*) is used for this purpose; it is tied with a loop of *morove* vine which serves as a rowlock. Small canoes are owned by individuals, but large ones are the property of all the men of an *eravo* (clubhouse). After a large double canoe is made, the *eravo* responsible for it gives a feast to others in the village, apparently for help in the making of the canoe.

Mr. R. G. Speedie informed me in 1931 that the first double canoes found east of Cape Cupola occur at Karama where there are two types: a small one (*eroti*)

used only in creeks, and a large sea-going canoe (*mavaia*). In the *croti* of Karama (Kaipi, 7) and the *oroti seita* of Eavara (Moviavi), Kukipi, Toaripi (Motumotu), and other villages at the mouths of the Tauri and Lakekamu (districts 8, 9), the booms rest on the gunwales; over them above each gunwale is a longitudinal pole. The booms are lashed to the pole and the pole is lashed to the hull through holes several inches below the gunwale. The fore and aft ends of the hull are carved simply. In the villages at the mouths of the Tauri and Lakekamu there is also a double canoe (*oroti louaia*) identical with the *croti* and *oroti seita* but much larger. The large sea-going double canoe is here called *mamea*, these are dismantled in the southeast season. In the large double canoe (*oroti louaia*) and the smaller kind (*oroti seita*) the end carvings as seen from above are called *kirori*. The teeth or knobs below, which occur only at the stern of double canoes, are called *harau;* they may be from 3 to 5 in number.

Bastard (1923, p. 46) says:

> The Toaripi build quite the best canoes in the Gulf Division, which are all double canoes. They trade with the natives of the Central Division as far east as Hula, supplying canoes, sago, and betel nuts in exchange for cooking pots and shell armlets, but now they prefer cash. Originally the natives of the east came to Toaripi for trading purposes, but of late the Toaripi have visited the eastern villages, making large multiple canoes for the purpose.

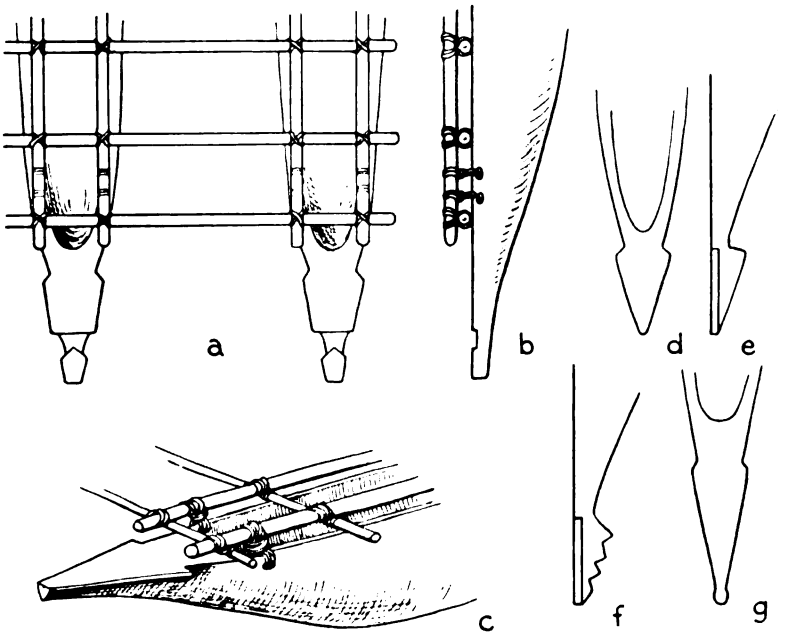


FIGURE 126.—Double canoes (*iroti*), Jokea, Gulf of Papua: *a*, bow end; *b*, side view of bow; *c*, bow end of another hull, there should be two lashings of the *peri* to the hull; *d*, *e*, upper and side views of usual type of stern (*iroti evoi*); *f*, variant of stern end, called *iroti halau*; *g*, variant of a bow (after F. E. Williams).

In the double canoe at Jokea, according to Williams, the connecting booms (*haru*) are laid on the edges of the hull but not tied thereto; over them and above each gunwale is laid a stout pole (*peri*) to which the booms are lashed; the *peri* is strongly lashed at intervals to the rim of the hull (fig. 126, *a*, *b*, *c*). The upper surface of the bow is called *iroti soso* (canoe face; fig. 126, *a*, *c*). The stern, when it has the usual median ventral keel, is called *iroti evoi* (fig. 126, *e*), but

when the keel is toothed it is *iroti halau* (fig. 126, *f*); *halau* is a pod used as a rattle. The carving at the ends of canoes varies considerably, but it has the same general character as occurs farther west.

In describing the Toaripi, Chalmers (1898, p. 327) says:

> Logs are felled up the river and floated down, the canoes being laid close to the village on the banks of the river. They use paddles (see Edge-Partington, 1895, pl. 202, fig. 2) and generally sit when paddling the canoe. The large war canoe (*lakia*) consisted of two canoes lashed about 6 feet apart and connected by a platform on which the fighting men stood with a large supply of bows and arrows fastened to a railing; the men stood up when paddling.

In his manuscript notes Holmes writes:

> The Toaripi are preeminent among the Ipi tribes in every respect as regards their canoes. Both the large and small canoes are generally double. Few have outriggers, though among the other tribes more outrigger canoes are to be found than double canoes. The outrigged canoe predominates only among those tribes who fish for sharks, whereas the double canoe is in general use only in riparian villages, probably on account of its greater carrying capacity. Apparently outrigger canoes, as compared with double canoes, are, or were, more common from Orokolo to Kaipi (Karama); and less so from Kaipi to Jokea.

Abel (1902, pp. 72-79) gives an interesting account of a voyage in an *olote* from Toaripi to Port Moresby in about 1891, and of some of the magical practices then employed. The *olote,* which is the same as the Motu *lakatoi,* consisted of six huge dugout canoes lashed together. Around the outside of these canoes was a kind of fence, nearly 5 feet high, which enclosed the whole of the cargo, consisting of sago. Abel writes:

> "Outside this wall there was a platform five feet wide, strongly decked with rattan, which entirely encircled the ship. At each end of the vessel, within the enclosure, a house was erected the width of the canoes, its open front facing the inside of the ship . . . she had an immense mast amidships, and a smaller mast at each corner; she carried on her mainmast a tremendous claw-shaped sail made of matting. Her smaller sails were oblong [Abel's photograph does not show these] . . . Her anchor was a huge piece of rock stoutly bound about with thick cane, with a piece of hard wood about six feet long lashed across the top. This was to facilitate the mariners hauling the anchor on board. The anchor chain consisted of a very long, strong cane which, as it could not be coiled up like a rope . . . had to be bound round and round the outside of the huge vessel when the anchor was weighed."

Holmes (1902, p. 431) says:

> During the northwest monsoon many of the Elema [Ipi] tribes send large double canoes loaded with sago to various Motu villages some 200 miles down the coast. Prior to setting out on this voyage, a village sorcerer is engaged to intercede with Avaralaru, the god of the northwest wind, and with the god of the sea, that they may give the voyagers a safe return journey. Two old men, who are considered to be sacred during the voyage, accompany these expeditions so that they may exert their influence on these gods.

At Oiapu (10), immediately north of Cape Possession, according to Bastard (1922, p. 78), there are only double canoes (*oloti*) with calico sails (*kilc*). The cross poles (*mauti*) of light wood are placed at intervals of approximately 1.5 to 2 feet; longitudinally over these and above each hull is bound a bamboo pole (*pele*). (Bamboo is called *teto.*) The platform (*pasa*) is decked from end to end with split bamboo. Oars (*fala*) and the steering paddle are used with loops of *molowe* (*loia*) vine; the paddle is called *tai-ita.* Canoes are not used in the heavy southeast season, but are suitable for long trips along the coast in moderate weather. The dugouts are from 18 to 30 feet long, 3 to 4.5 feet wide, and 1.5 to 2 feet deep;

they carry from five to ten men. Generally a canoe belongs to two men. When a new canoe is finished the owners give a feast to the villagers for assistance rendered; no dance is held.

Rafts

Rafts are recorded only for the Orokolo and Kiri; they are constructed of five *iohea* (*ilimo*) logs tied together and braced by five transverse *iohea* sticks. Those of the Kiri are about 28 feet long and 5 feet wide and are used for the transportation of building material. Nowhere are tree trunks or floats employed for water transport.

Summary

According to the traditions collected by Holmes, the Uaripi, now of Kerema Bay, were the first of these inland tribes to reach the sea. According to Bastard they had no outrigger canoes in 1922, though it is probable that they had them formerly. The Milaripi and the Kaipi (Newo) followed the Uaripi. The Moreaipi (Orokolo) seem to have settled in relatively recent times at Orokolo. We may conclude, provisionally, that outrigger canoes and double canoes were introduced to the Uaripi, Milaripi, and Kaipi; perhaps first to the Milaripi and Kaipi. The use of sea craft was adopted by all these inland tribes on their several arrivals at the coast, but simple outrigger canoes do not seem to have found favor either among the Kerema, Opau, and Tauri peoples, or in the Freshwater Bay district and down the coast to Cape Possession.

The Port Moresby legend of the origin of the *hiri* given by Barton and the legend given by Chalmers (1887, p. 33) may be regarded as recording the introduction of sea craft to the Gulf of Papua. The Gulf type of outrigger with its forked boom and one pair of undercrossed connectives presents a difficulty. Forked booms occur east of Port Moresby as far as Aroma, but the two connectives are vertical and parallel. At Port Moresby the simple booms have one pair of undercrossed connectives, with an additional stick; this continues as far west as Hall Sound and possibly up to the east of Cape Possession. Forked booms with parallel connectives also occur in New Ireland and the Gazelle Peninsula (figs. 81, 85).

The carvings at the ends of the hulls are usually more elaborate than those of the canoes of the Motu peoples. An inspection of a considerable number of sketches leads to the conclusion that the carvers had in their minds a human head and body, which is not surprising as the human head and form play a predominant part in the decorative art of the Gulf natives. The crocodile and human motives may be regarded as analogous to the prow-carvings of the middle region of the Sepik River in the Territory of New Guinea, and it is quite possible that they are related to one another.

The Gulf Division affords an interesting example of inland peoples who, on arrival at the coast, have to a varying extent adapted themselves to seafaring and in very recent times also to long trading expeditions by sea.

CENTRAL DIVISION

The coastal area from Cape Possession to Cape Rodney inclusive (148° 23′ E.) may for the present purpose be regarded as one ethnographical province, with minor subdivisions, of the western Papuo-Melanesians of Seligman (1910, map, p. 6). Throughout this stretch of coast, as in the Gulf Division, there are two main types of canoe, the small canoe with a single outrigger and the double canoe. It will conduce to clearness if I deal with each type separately, describing them in geographical order from west to east.

Outrigger Canoes

The Roro-speaking tribes extend along the coast from Kevori near Cape Possession to Delena at the eastern margin of Hall Sound. The Paitana dialect is spoken by the natives of the lowermost reaches of the Angabunga (St. Joseph River).

Certain designs or objects called *oaoa* are the distinctive badges of each *itsubu* or clan and each clan of these tribes seems to have the exclusive right to a particular name for its canoes, all of which are called by the same name, and at Waima each canoe name is associated with a particular sign or badge. Each canoe name (*nepuwai*) is the name of a *marea* or clubhouse. It is recorded by Seligman (1910, p. 214) that the majority of canoe names had been bought or stolen from the Motu. Thus it would seem that in this area, as among the Toaripi, there is clan ownership of canoes as well as of clubhouses.

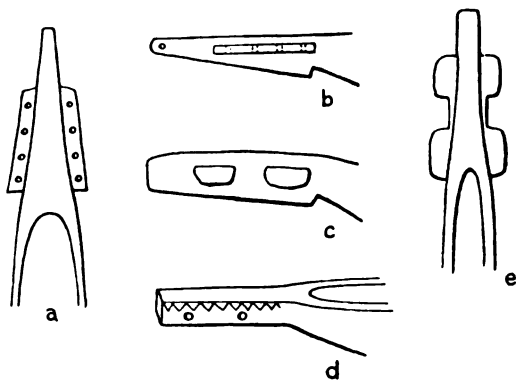


Figure 127.—Details of outrigger canoes (*vanagi*), Delena, Central Division, Papua: *a*, *b*, upper and side views of bow (*bodina*); *c*, *e*, the same, of another canoe; *d*, another type of bow (sketches by A. C. Haddon, 1914).

No descriptions are at hand regarding the structure of the outrigger canoe along the coast from Cape Possession to Hall Sound. Referring to the Waima (Maiva) people, Stone (1880, p. 29) says: "The sails of their smallest canoes are very primitive, being sometimes composed of a single sago palm-leaf [as I saw in the Purari Delta] or else of two sago palm-stalks supporting between them a sort of cloth made of tappa." Seligman (1910, p. 204) says that the canoes are made locally at Waima and at Siria on Yule Island, and probably at other villages of the Roro-speaking tribes, but they are frequently bought from the Toaripi. Judging from a photograph taken by the Rev. H. M. Dauncey, the Waima canoe is similar to that of Delena.

The following canoe terms occur at Waima (W) and among the Roro (R): canoe, *ahi* (W, R); boom, *idaba* (W); float, *karimo* (W), *banaki* (R) (compare the Motu term *vanagi*, canoe).

Delena

The village of Delena possesses a considerable number of single and double canoes; the hulls of the former are much smaller than those of the latter.

The bow (*bodina*) of most outrigger canoes (*vanagi*) is prolonged horizontally into an elongated quadrangular projection with a squared end, the sides of which are often furnished with shelf-like wings, which may be perforated for tassels (fig. 127). There is thus a resem-

blance to the carved ends of the canoes of the Gulf region. There are no washstrakes, but there may be a thin gunwale pole (*haiiana itovana*).

The four to seven booms (*irava* or *ilava*) are approximately evenly spaced, but in some canoes the outer booms are more widely spaced than the inner booms. The float (*tarima* or *talima*) is nearly as long as the hull, its upper surface is straight and flat, and the lower surface slopes up to the usually pointed ends.

The typical attachment consists of four sticks (*ikoko*) the arrangement of which seems to be a modification of that characteristic of Port Moresby, but in Delena, instead of a central pair of undercrossed sticks, the two central sticks are lashed to one side of the boom; thus one stick passes under the boom and the other is either vertical or convergent over the boom (fig. 128, *a*). There are also two oblique sticks which are inserted into the float and diverge from each other, one slanting outward and the other inward toward the hull; they are tied either on both sides of the boom, or on one side only. Rarely do the central pair of sticks cross under the boom. There may be slight divergences from the typical arrangement of the attachment.

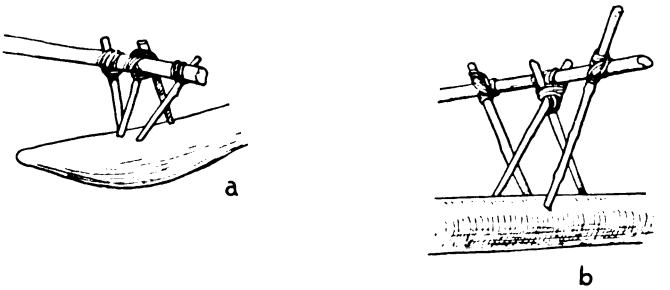


FIGURE 128.—Connectives of *vanagi*, Central Division, Papua: *a*, Delena; *b*, Port Moresby.

The long platform (*itara*) is supported by the booms; it extends beyond the hull on both sides, but to a greater extent on the outrigger side; it is made of bamboo (*kemo*). I was informed that the longitudinal bamboos are called *kumoz* and that the transverse ones which strengthen the platform are called *ikopoki*.

A photograph taken by De Rautenfeld near Inawai, on the Angabunga River, shows the Delena type of outrigger canoe. I do not know whether it was merely visiting there, or whether such canoes normally occur on the river.

PARIWARA ISLANDS

According to Macgillivray (1852, vol. 1, p. 294) the canoes (*wanagi*) at Pariwara Islands, off Redscar Head, were

". . . nearly of the same description as those commonly seen at the Brumer and Dufaure Islands, but the outrigger float [*darima*] was rather shorter, having only five poles [booms, *ilava*] to support it instead of seven or eight, and the bow [*kura-kuro*] and stern [*tareiya*], especially the former, much sharper and more raking. On the side opposite to the outrigger there was a small slightly projecting stage of two planks only. The paddles [*hawta*] were six and a half feet in length, much clumsier than those seen in other parts of New Guinea [southeast], and without the carving on the handle, the blade also differed slightly in shape, being more elliptical. . . The sail [*geda*] resembled the common one of the Louisiade, being long, narrow, square at the ends, and stretched between two yards or masts [*aiwar*], and in setting was merely stuck upon end and supported by guys fore and aft."

Macgillivray seems to have made a mistake in his comparison. This sail was undoubtedly of the same type as the now obsolete quadrangular sail of the Motu, which is described later. From his vocabulary (1852, vol. 2, p. 322) we learn that there was a pole (*eiwara*) along the gunwale. A wooden bailer (*dihu*) was used. His unconvincing illustration shows that the attachments consist of several

more or less vertical sticks lashed to one side of each boom; it thus appears to belong to the Delena type.

The Motu-speaking peoples live along the coastal region from the mouth of the Vanapa River, Redscar Bay, to Round Head (147° 30′ E.).

PORT MORESBY

The small indigenous canoes (*vanagi*) of Port Moresby (fig. 129) have long sharp ends (*kurukuru*); the bow (*dama* or *bodina*) more particularly is usually produced into a long spur which is flat above and below, but some ends are square. The sides of the spur, which generally converge in a wedgelike manner, may be decorated and provided with perforations from which tassels may depend. The cavity of the hull is called *laloma*.

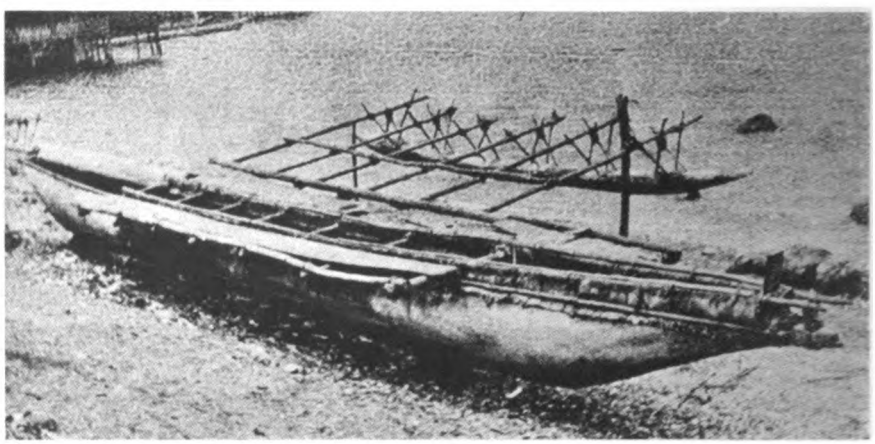


FIGURE 129.—Small canoe (*vanagi*), Port Moresby, Central Division, Papua (photograph by Kathleen Haddon, 1914).

A pole (*laralara*) made of mangrove with red bark is fastened on each gunwale from bow to stern where its end is lashed to the terminal spur (*kurukuru*). The booms lie on these poles and over them are lashed two other poles (*halasi*), which are of wood or bamboo. They extend from the stern to the first boom or slightly beyond it, with their aft ends lashed to the stern spur and their fore ends lashed to the hull. Coconut cloth (*nuru*), the sheath of the leaf, is placed beneath the lower pole of each side, this covers its inner side and passes over the upper pole and downward over the outside of the lower pole. The cloth is kept in position by having the two sides sewn together below the upper pole and by a split bamboo (*ikahi*), which is fastened over the cloth and below the lower pole on the outside of the hull (*kununa*). The lower edge of the cloth is trimmed off below the bamboo (fig. 130). The screen is closely packed inside with dried banana leaves (*dogoro*). A split bamboo lath is sometimes lashed over the cloth that covers the upper pole. This structure forms a weather-screen which extends from the stern to the fore boom (fig. 129). A small vertical breakwater (*babari*) fills up the space between the weather-screens at the stern and is packed to keep out the water. When there is no weather-screen only the *laralara* is present. There may be one or two thwarts (*tumo*).

F. E. Williams has recently informed me that he was told that the weather-screen might extend from end to end, but in the larger canoes it extended only as far as the fore boom. It was explained to him that when fishing in more or less calm water the canoe normally travels bow foremost. When fishing it is more convenient to have the fore end of the canoe unenclosed by the screen. The polers prefer to stand on the edges of the dugout and this is easier if the screen is absent, otherwise they are liable to be tripped up. If a large canoe rides heavily it is sometimes necessary to enclose the whole length and put up with the inconvenience. At the present time the screen is often replaced by a washstrake and the fore and aft ends of the dugout are also boarded over.

The booms (*ilava*) pass through the weather-screens—that is, between the two gunwale poles—and were formerly always six in number; now there may be five or seven. The ends of the booms which project over the off side of the hull bear a narrow platform (*enoeno ilaha*) for the crew to sit upon. This consists of one or two planks and a stringer (*ilaha gevahu* or *gevageva*), or there may be two or more stringers. A similar platform (*darima ilaha*) on the outrigger side is used for nets and other gear. Formerly its stringer was prolonged toward the stern (*gabena*), to which it was lashed, and the three planks were of corresponding length;

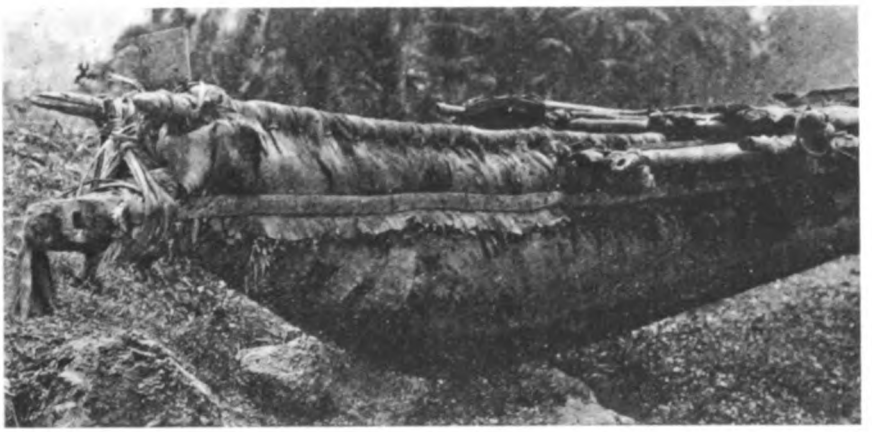


FIGURE 130.—Weather-screen of a *vanagi*, Port Moresby, Central Division, Papua (photograph by Kathleen Haddon, 1914).

they, as well as the planks of the off platform, were supported by a thwart pole (*koinai*) (fig. 131, *a*). The stern extension of the platform was formerly a constant feature, though now it may be absent. There may be a fireplace (*rahurahu*) on the platform. Frequently there is a stringer (*darima gevahu* or *gevageva*) about the middle of the length of the booms and there may be another where the oblique connectives (*tor*) are fastened to the booms. The booms should be made of mangrove, but the stringer may be made of any kind of wood. I am indebted to Williams and Seligman for some of these details.

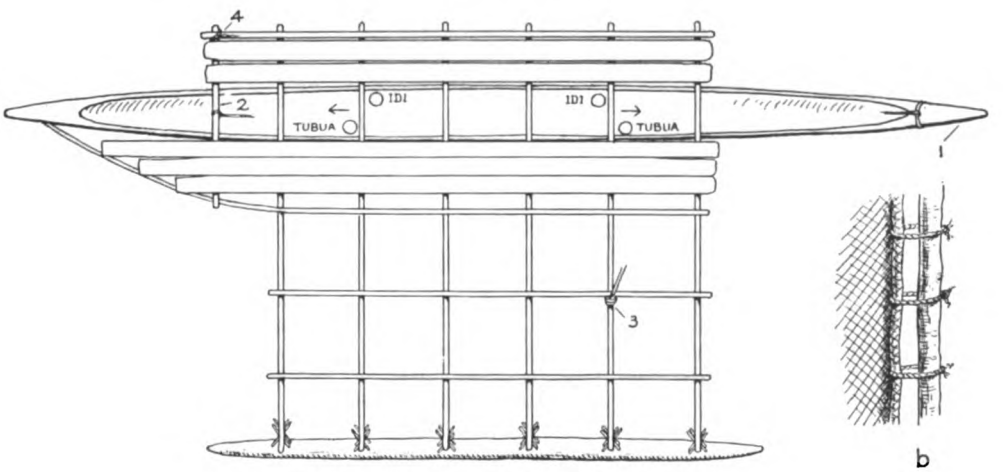


FIGURE 131.—Details of a *vanagi*, Port Moresby, Central Division, Papua: *a*, plan, when sailing bow foremost the fore-and-aft stay is made fast at 1 and 2, the *irami* at 3, and the sheet at 4 (from a sketch by F. E. Williams, 1932); *b*, method of fastening the sail to a spar.

The float (*darima*) is shorter than the hull and is pointed and raked at the ends; it may be made of any kind of wood. The typical attachment consists of a pair of crossed sticks (*ikoko*) of mangrove wood, on the crossing of which the boom rests, and an oblique stick (*ta* or *tor*), which arises below the cross, passes upward and inward to be attached to the boom. Often there is a second oblique stick which passes upward and outward and is fastended to the boom beyond the crossed sticks (figs. 128, *b;* 129). One photograph shows attachments of two pairs of undercrossed sticks only, but this is very unusual.

These canoes were frequently rigged for sailing with a rectangular matwork sail (fig. 132), but this has in the neighborhood of Port Moresby been entirely replaced by a European sail and rig. Williams kindly made inquiries for me, and some men of Elevala, which is the real fishing village of Poreporena, were very pleased to demonstrate the old fashion for him:

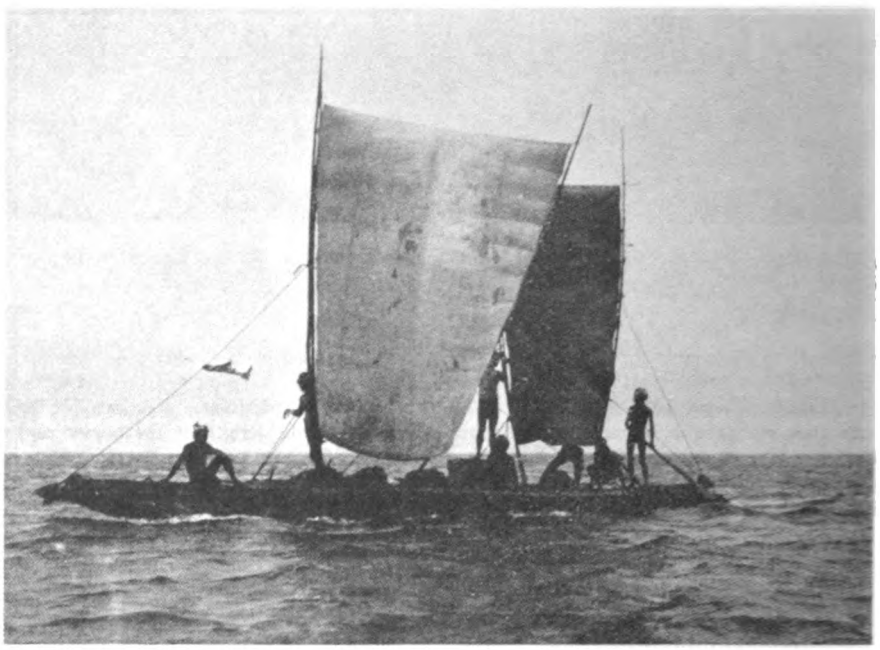


FIGURE 132.—*Vanagi* under sail, Port Moresby, Central Division, Papua (photograph by C. G. Seligman, 1904).

The rectangular sail (*geda*) was made of plaited *geda*, a river plant, presumably a kind of rush. The word *geda* is also used for the plaited sleeping mat of the same material. Pandanus leaf is not used by the Motu for these sails. The edge of the mat sail was bound all around over a bolt-rope (*kwanau*). On each side it was attached to a vertical spar by a series of loops of a light rope called *rosi*, not by a continuous lacing (fig. 131, *b*).

The vertical spars were mangrove poles (*aivara*) such as those used for poling canoes. There was no kind of fixture for stepping them; when the sail was set they were simply allowed to stand on their bases in the bottom of the canoe. The use of the sail and spars was purely temporary and there was no regular fixed mast. The spar on the windward side was called *tubua*, which is the word for mast both in the modern outrigger canoe and in the *lakatoi*. The spar on the lee side was called *idi*. The *tubua* which had to stand a greater strain was the stouter spar and when it bent too much before the wind it was reinforced by the addition of another *aivara;* the two were tied together, as can be seen in figure 132. The canoe always sailed with the outrigger to windward; when it was necessary to go about the sail was shifted to the opposite end of the hull.

The *tubua* was placed immediately in front and the *idi* behind the second outrigger boom, according to the direction of the canoe in sailing (fig. 131, *a*). When traveling bow (*idama*) foremost, the *tubua* was held in position by a long fore-and-aft stay (*tubua-kwanau-na*) one end of which was tied to the bow (fig. 131, *a*, 1) and the other to the thwart pole (*koinai*) (fig. 131, *a*, 2); it was knotted to the *tubua* about halfway up. When traveling stern end foremost the rope was probably tied to the stern and inboard to the last boom. The other stay, a strong rope (*irami*), was tied to the *tubua* rather low down, at just about the bottom of the sail, and made fast to the second boom just outside the central stringer (fig. 131, *a*, 3). There was no wooden strut for the *tubua*. The *idi* had only a sheet (*idi-kwanau-na*) tied about halfway up, with the other end made fast to the end of the *koinai* (fig. 131, *a*, 4). When the canoe was sailing in the opposite direction the points of attachment for the *irami* and *idi-kwanau-na* had to be adjusted accordingly. The two sail spars spread out somewhat to a V-shape. The man holding the sheet could, to some extent, let out the sail or draw it in. When waiting for a wind, the *idi* was brought over to the *tubua* and the sail wrapped loosely round both. A fore stay might be fastened about the middle of the *idi* and made fast to the outer corner of the *enoeno ilaha* in order to prevent the sail from flapping about; there was no need for such an arrangement in actual sailing. Outrigger canoes sometimes had two such sails, which were placed in the positions just described, but the *tubua* of the aft sail would be placed in front of the fifth boom and the *idi* behind it.

FIGURE 133.—Outrigger canoe (*ai*) at Hula, Keapara area, Central Division, Papua (photograph by Capt. Frank Hurley).

I am much indebted to Mr. Williams for his permission to publish this first account of the method in which a *vanagi* was sailed.

Throughout the Central Division the hull is a dugout of the Port Moresby type. There is no washstrake, only a gunwale pole on which the booms rest.

KEAPARA AREA

A distinctive type of outrigger attachment begins at Tupuselei, east of Bootless Inlet, and extends to the eastern border of the Aroma villages and possibly somewhat farther east. From Tupuselei to Round Head, Motu is spoken. To the east are the allied dialects of: Hula, spoken in the villages of Hood Peninsula; Keapara or Kerepunu on the east side of Hood Lagoon to Kepel Point; Galoma or Aroma from Maopa village in Keakalo Bay to the head of Cheshunt Bay

(148° 18′ E.). Thus according to Ray's map (1907, p. 288) this type of attachment is employed by tribes of western Papuo-Melanesians who speak different dialects. It is desirable for the sake of reference to give a definite name to this area, so I propose to term it the "Keapara area", as that village is a great center for the making of canoes. The Hula (Bula'a) terms are given below, those at Tupuselei are mainly the same as those of Port Moresby.

The outrigger apparatus from Tupuselei to Keapara consists typically of six forked booms (*viaro* or *biaro*), but they range from four to ten in number according to the size of the canoe, usually the branch is uppermost. The float (*ralima*) is shorter than the hull, but may be nearly as long; the ends are raked and bluntly pointed (fig. 133). Each attachment consists of two vertical sticks (*ginigini*), one on each side of the fork, to which they are lashed; sometimes they are not directly opposite each other. The upper ends of the sticks may be lashed together (fig. 134). Occasionally one or more attachments of a canoe may have but a single stick.

FIGURE 134.—Connectives, Tupuselei, Keapara area, Central Division, Papua (photograph by Kathleen Haddon).

A stringer (*hivihau*) is sometimes lashed over the booms close to the forks (fig. 134), or there may be one at about the middle of their length or nearer to the hull. On each side of the hull and close to it one or two poles (*ese*) may be lashed over the booms. All these variations have no special significance.

The canoe terms from Delena to Kapakapa are: canoe, *vanagi* or *wanagi*; boom, *ilawa* or *ilava*; float, *darima*. At Tupuselei I obtained *idimo* for canoe. Sinaugolo: canoe, *ngasi*. Ikoro: canoe, *gasi*. Hula: canoe, *ai*; boom, *viaro* or *biaro*; float, *ralima*. Keapara: canoe, *ai*. Keakaro tribe from Vererupu to Paramana Point: canoe, *gai* or *ai*. Paramana (Aroma): canoe, *vai* or *gaii*; boom, *karawa*; float, *lalima*. Farther east beyond Aroma—Domara: canoe *auna*; Mailu, *vaona*. Perhaps the distinctive name for canoe in the Keapara and Aroma areas is due to the retention of an old term for a dugout and may be equated with the *asi*, or dugout of a multiple canoe, of the Motu. Macgregor (1897-b, p. 56) says:

> "The great majority of the ordinary working canoes for the central district are made at Keapara [Kerepunu], nearly 60 miles east of Port Moresby. . . The whole village is practically composed of professional canoe-builders, of which craft, from half a dozen to half a score are always in course of construction."

When I visited Keapara in June 1898, the sand beach presented a busy scene (Haddon, 1901, p. 220, pl. 15; 1932-a, p. 112, fig. 12):

"The trees of which the canoes are made grow up the Vanigela River; they are cut down, and their trunks are floated down the stream to its mouth. The Kalo men sell the lumber to the Keapara men, who tow it to their village. [The wood is soft and has a very disagreeable odor when it is cut.] The outside of the canoes is cut with steel tomahawks obtained from the white man, but the logs are hollowed out with stone adzes, the stone blade of which can be shifted round to any angle by turning the holder on the shaft. . . After the canoes are dug out and trimmed down they are charred by fires lit outside and inside them; the effect of this is to harden the wood, and I suppose to somewhat fill up the pores so as to make the craft more seaworthy. I believe that one result of applying fire to the canoes is to make them open out more widely."

AROMA

Paramana at the western end of Keakaro Bay has the same type of canoe (*gaii* or *vai*) as those farther to the west. The gunwale pole is called *rabu*. In 1914 I saw some small canoes with one or two of their booms (*karawa*) without a fork; this may have been due to carelessness, or more probably to influence from the east. In one canoe a boom had a three-pronged fork. Normally the attachment consists of two vertical sticks and frequently also a third oblique stick which passes upward and inward from the float (*lalima*). I noticed in one canoe two sticks (*iaro*), one on either side of a fork and in another there were four sticks all on one side of the fork. There is throughout the Aroma district, which lies east of 148° E. to about Cape Rodney, more irregularity in the outrigger apparatus than occurs between Tupuselei and Keapara.

Armstrong photographed numerous outrigger canoes at Velerupu (McFarlane Harbor, Aroma) all of which belong to the Keapara type.

Double Canoes

Double canoes are found in various degrees of frequency along the coast from the Gulf Division to Orangerie Bay. In the Gulf and down the coast as far as Delena, and to a less extent much farther east, the hulls of the largest double canoes are much longer, more massive, and usually less carefully constructed than the hulls of outrigger canoes. The ends of the hull are rounded and usually have an upper flat horizontal projection. The Motu name for such a hull is *asi*. At Kapakapa I saw a double canoe of this type that was about 40 feet long and doubtless came originally from the Gulf.

The Waima (Maiva) villages lie a few miles east of Cape Possession; beyond them is Kevori, the most westerly of the western Papuo-Melanesian settlements. Finsch (1914, p. 475) says: "Sometimes two *vanaka* are tied together. Ten men came from Maiva to Port Moresby in one of these double canoes." This may have been true, but it is more probable that it was really composed of two small *asi*. I was told that the Waima name for a double canoe is *ahi rua iviri*. Other names are: small canoe, *ahi koikoi-ina*; boom, *idaba*; sticks, *ikoko*; float, *karimo*; platform, *itara*.

According to Seligman (1910, p. 214) the majority of the Waima names given to canoes are those of fish, but some are taken from bird names. It is said that the majority of such canoe names had been bought or stolen from the Motu. The use of a canoe name by another local group (*itsubu*) is resented. Seligman (1910, p. 204) says that the canoes are made locally at Siria, a village on Roro or Yule Island, and at Waima, and probably at other villages of the Roro-speaking tribes, but they are frequently bought from the Toaripi. The Roro tribe have

learned from the Motu to build *lakatoi* and to make pots, and one *lakatoi* usually leaves Yule Island each year for Toaripi. Sometimes a Waima double canoe bearing a cargo of coconuts may visit Port Moresby. Waima has long done a small coastal trade with the Papuan Gulf.

The double canoes at Delena are composed of two *asi* lashed together a foot or two apart. The ends of the hulls may slope up gradually from the median ventral line to a rounded extremity, or they may end more or less abruptly, being continued above into a horizontal spur. The *asi* are provided with a washstrake; over the junction of this with the hull a split bamboo may be placed with the convex side outward, or the seam may be calked with leaves. The washstrake is sometimes continued around the end of each hull. A platform extends nearly the whole length of the hulls and sometimes well beyond them; it is composed of a series of transverse poles lashed to the hulls; usually there is a similar pole fore and aft which connects the end of one hull with that of the other. Narrow planks are frequently fixed longitudinally over the cross poles and occasionally on these poles when they project beyond the outer sides of the hulls. We took a photograph of a double canoe off Delena in 1898 which had an oblong sail amidships supported by lateral spars. At the present day a sprit sail may be similarly hoisted.

Semon (1899, p. 319) gives an illustration of a "lakatoi", which is really a double canoe, on the beach at Siria, Yule Island. The deck is fitted like a *lakatoi* and he says the masts had been removed. The *asi* are shown as being composed of two pieces, one above the other; the terminal spurs are prolongations of the upper half which is sewn on to the hull. No mention of this built-up *asi* is made in the text, nor does anyone else allude to such an arrangement. Although Semon speaks of his illustration as a photograph, I believe it to be a drawing which may be based on a photograph. In another illustration (1899, p. 345) Semon shows in a "Papuan pile-village" a *lakatoi* under sail, a Massim canoe, and an outrigger canoe with an unknown single-stick attachment—a combination craft which could not easily occur in one locality. This illustration has been copied by Weule (1912, pl. 62), who describes it as "Ein Pfahldorf in West-Neuguinea"!

Stone (1880, p. 65) says that the Port Moresby double canoe (*akona*) is usually composed of two *asi* with a platform and is used for minor local transport. A smaller form is called *atsi*.

Photographs of "house-boats" which are in the collection of the Royal Geographical Society were taken by R. E. Guise at Bula'a (Hula) about 1898. They show a long rude shelter built on the platform of very long double canoes. The platform extends laterally a long way beyond one canoe; this side of the hut may be walled in or the roof may slope down to within a short distance from the platform. The other side is quite open; the ends are covered with matting and leaves. Nothing has been recorded concerning the significance of these erections.

From Port Moresby to Cape Rodney one finds small double canoes. Some are of the *asi* type, but most of them are built of two ordinary canoes (*vanagi*). At Kapakapa my daughter photographed a double canoe composed of two *vanagi* about 2 feet apart, which were connected by a platform that extended along the whole length of the hulls and consisted of closely lying poles lashed to the hulls over thin gunwale poles. The free ends of the cross poles were kept in position by a longitudinal pole (fig. 135).

Our photograph at Paramana, Aroma district, shows an essentially similar arrangement, but the cross poles were farther apart and the interval between the hulls was boarded over; the decking was flanked on each side by an additional longitudinal pole. W. S. Armstrong photographed a similar canoe on the Vanigela River, but the longitudinal poles were absent. Sometimes closely-laid longitudinal poles are used between the hulls instead of boards.

A photograph (Ann. Rept. British New Guinea 1897-98, 1898, pl. 22) of a "canoe decorated (Central District)" is presumably a double canoe with a single mast, but the crab-claw sail is unlike any I have seen; one horn is very broad and the other is much shorter and acutely pointed. There is no indication of its provenance.

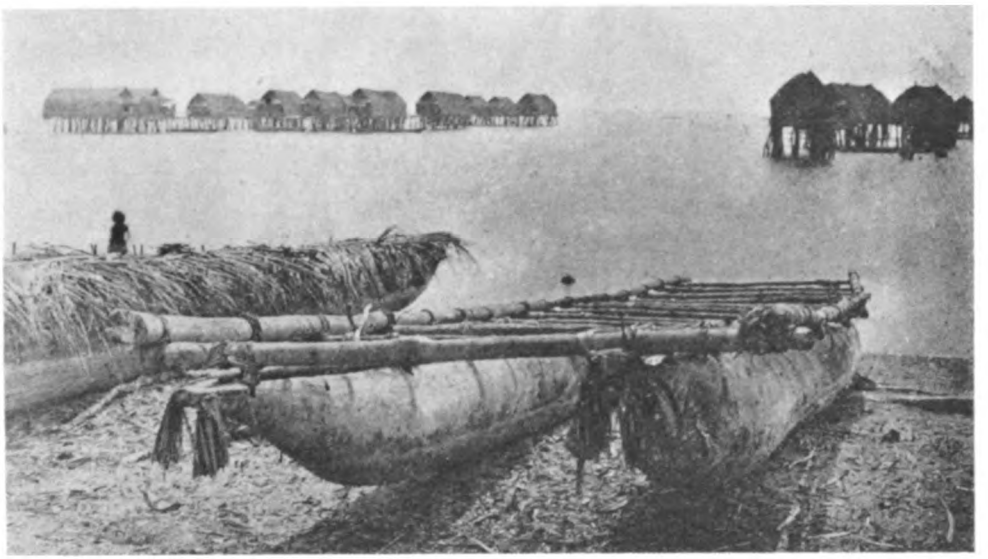


FIGURE 135.—Double canoe, Kapakapa, Keapara area, Central Division, Papua (photograph by Kathleen Haddon).

LAKATOI

The most characteristic of the Port Moresby craft is the *lakatoi*. The name is derived from *laka* (Motu form of *wa, waka, waga,* etc.), and *toi* (Motu form of *tolu,* three). Illustrations of *lakatoi* can be found in most books that deal with this part of Papua.

The following account is taken mainly from Barton's contribution to Seligman's invaluable book (1910, pp. 96-120):

A *lakatoi* is composed of three or more *asi,* which are made of a soft-wood tree (*ilimo*) of great size that grows close by rivers in their low alluvial reaches in the Papuan Gulf district. The Gulf natives fell the trees and float them to the *lakatoi* that have arrived on a trading expedition (*hiri*). The trunks are hauled on to the bank of the river, where the visitors hollow them out and shape them. Fire is not employed in this operation. An *asi* is a clumsy dugout with rounded or squared ends prolonged above into a projecting flat beak. An unusually large one measured in 1886 had a length of 47 feet 8 inches from the tip of one beak to that of the other. Other dimensions were: length of bottom of hull, 36 feet 7 inches; length of each beak, 2 feet 3 inches; greatest circumference, 15 feet 7 inches; inside depth, 3 feet 2 inches; inside middle width, 2 feet 7 inches.

The *asi* are secured together by numerous cross beams which are tied by lashings that pass through square holes cut in their gunwales. Over these beams a large platform or deck (*ilaha*) is constructed; this must be made very strong as it has to stand the strain of the great waves of the Gulf. The platform extends beyond the *asi* especially fore and aft. In 1884 the largest *lakatoi* which arrived at Port Moresby from the Gulf consisted of 14 *asi* and measured 59 by 51 feet; two smaller ones measured 54 by 37 feet.

Lyne (1885, p. 40) says that at each end of the platform a deck-house is constructed of split bamboo and pandanus leaves. They are oblong huts entirely open toward the center of the craft and have a flat roof that slopes away from the opening. On each side of the platform large strong crates are made with great care to safeguard the cargo of pottery.

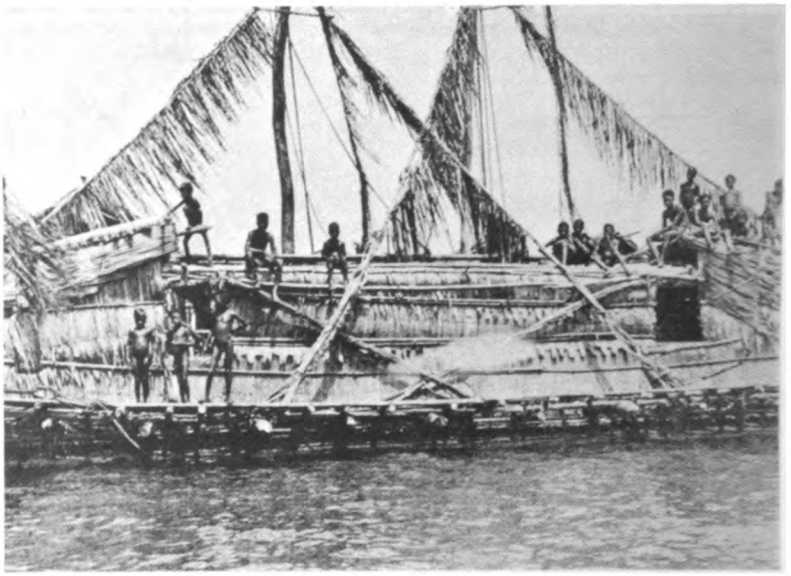


FIGURE 136.—Multiple canoe (*lakatoi*), Port Moresby, Central Division, Papua (photograph by W. E. Armstrong).

Two photographs taken by W. E. Armstrong show that a screen about 2 or 3 feet high runs along the whole length of the side of the *lakatoi*; it is a framework neatly and closely thatched with palm leaves and thus serves the purpose of a weather-screen. Amidships this screen is much higher and evidently serves to protect the cargo in the crates from spray. A strong rattan lashing is fastened to the upper end of a higher screen and passes amidships to be attached to the end of a cross pole of the platform; the lower ends of these guys cross each other (fig. 136). A gap is left between each end of the higher screen and the deck-houses to serve as an entrance into the *lakatoi* (fig. 136). Similar arrangements are shown in another photograph of a *lakatoi* (Ann. Rept. British New Guinea 1900-01, 1901, pl. 1).

Pratt (1906, p. 72) states that to form a *lakatoi* the *asi* are so ranged that amidships they are about 6 inches apart, though there is a wider gap at the ends.

Across the *asi* are placed long bamboos which extend for a considerable distance beyond the sides of the outermost hulls. At regular intervals, along the gunwales of each hull stout bamboo uprights are erected, and to these the horizontal cross bamboos are lashed. A floor of split bamboo is laid longitudinally across the framework. Openings are left in the floor above each dugout to enable the pottery to be stored in the hulls of the canoes. Wooden masts are stepped amidships and held in place with stout stays.

The anchor (*dogo*) is a large stone encased in a network of heavy lashings. The cable consists of lengths of rattan knotted together. Anchors are in the highest degree sacred (*helaga*) and nobody is allowed to step across the cable when the anchor is down.

There are two masts, each carrying an Oceanic lateen sail. A mast is made of the stem of a sapling of a species of mangrove, the top having a natural fork over which the halyards

pass. The larger roots of the tree are cut off to a convenient length and lashed strongly to the cross beams of the platform. The stay rope of the mast is the tough stem of a climbing plant, probably it is usually a rattan.

The sails (*lara*) have the form of an elongated ellipse, one end of which is pointed and the other very deeply emarginate, hence the term "crab-claw" sails. They are made by the sail captain of plaited mats (calico may now be used) sewn together and attached on either side to a long tapering mangrove pole or spar. When under construction sails are carefully measured to ensure that the two horns of each are of equal length.

Pratt (1906, p. 73) says of the sails:

"Being stretched on a frame they can not bulge, but swing like boards. Their points rest on the deck and work freely in a socket. The sails are hung lightly to the mast by braces, and there is no clewing up. In spite of their comparative rigidity they are quite manageable, and in case of sudden squalls can easily be let go."

Lawes (1896) gives the following names: *lara*, a large mat sail of *lakatoi*; *geda*, a mat, a sail, a plant which grows at the side of rivers, of which mats are made.

Stone (1880, p. 65) writes: "Some of their *lakatois* are propelled by half a dozen square sails, made of matting, each set between two masts, and others with a single elliptic-shaped sail." He gives a rough sketch of a *lakatoi* with six oblong sails set on end, one behind another in three groups of two. So far as I am aware this is the only record of a *lakatoi* fitted only with such sails. Macgillivray, as we have seen, saw a similar sail on an outrigger canoe at Redscar Bay, and I saw one on a double canoe off Delena. These sails were evidently similar to those used with the *vanagi* of the Motu.

Unfortunately there were no *lakatoi* rigged when I was at Port Moresby. Judging from numerous photographs and illustrations and the imperfect accounts in books, the rig appears to be as follows:

There are two masts (*autupua*, upright wood) stepped amidships on the platform by their truncated roots. Each is supported by a fore and an aft stay (*hadeolo*) which are fastened to the masthead and diverge widely; a short distance from the apex they are united by a cross-tie which gives the appearance of an A with long legs. The lower end of each stay is twisted on itself to form a loop, and this is lashed to a long loop of rattan the lower end of which is fastened to the end of one of the strong cross beams of the platform. This is clearly shown in Armstrong's photographs (fig. 136). I do not know whether such an arrangement is usual, at all events it is similar to that in the Mailu *orou*. A line is fastened to each side of a sail about one third from its upper end. One of these, the halyard, passes over the fork or notch at the top of the mast and by it the sail is hoisted and hauled close to the mast. The line on the opposite side of the sail serves as a sheet, it may be single or double. The lower apex of the sail works freely in a socket in the deck when the sail is vertical. When the ship is at anchor the sails are horizontal. All the illustrations represent two masts and two sails.

Various accounts have been given of the great trading voyages in the *lakatoi*, but by far the most complete of these is that given by Barton (see Seligman, 1910), on which the following brief account is founded:

Every year at the end of September or the beginning of October, the season of the south-east trade wind being then near its close, a fleet of *lakatoi* leaves Port Moresby and the neighboring Motu villages on a voyage to the mouths of rivers of the Papuan Gulf. They carry earthenware pots and ornaments, and of late foreign-made articles to barter for sago and the right to make *asi*. The origin of these trading expeditions (*hiri*) is veiled in obscurity. Barton carefully describes the inception and preparation of a *hiri*; certain men and objects are *helaga* (sacred, set apart, charged with virtue), and various magical rites are performed. The *asi* are repaired and the *lakatoi* are constructed and fitted. Beside the usual streamers and other decorations they are adorned with the badges of the clans of their captains, and

an ornament consisting of a framework of cane to which are affixed *Ovulum* shells is fitted upon the top of each mast.

When all is ready and the *lakatoi* are decorated a competitive trial sailing takes place. Young girls dance on the springy projecting platform (*maramara*) which for the time being is in front; the aft platform is occupied by some half dozen men wielding heavy steering oars. When everything is found to be satisfactory, the vessels are taken back to their moorings and shortly afterwards they are loaded with their cargoes of pots.

Various rituals are employed when sailing and ceremonies are performed on arrival at the destination. Each man selects a Gulf native to be his *tarua* or special friend, and presents are exchanged. The trading then begins and new *asi* are made, as has been previously noted. The *lakatoi* are taken to pieces and reconstructed with new *asi* on a larger plan, but till the reconstruction is complete the *sede* may not be beaten nor songs sung; when finished, any of the *lakatoi* songs may be sung except the *lara toa*. The sago is then loaded. Ritual observances are maintained on the return journey. During the absence of the fleet the wives of the chief men have to observe the same taboos as their husbands, and their fires are never allowed to go out.

A trading language is spoken by the Elema (Gulf) natives and their visitors according to Barton (Seligman, 1910, p. 119). Thus a canoe is called *oroti*; ship, *mevara*; sail, *lara*; paddle, *taita*.

Barton (Seligman, 1910, p. 114) gives some idea of the magnitude of these trading voyages:

> For several years an average fleet consisted of 20 *lakatoi*, with about 29 men in each. In 1885 four *lakatoi* left Port Moresby, each carrying an average number of 1628 pots. In 1903 a *lakatoi* of four *asi* carried 1296 pots, or 324 for each *asi*. (Assuming that 20 *lakatoi* sailed that year, each composed of four *asi*, there would be a cargo of 25,920 pots.) This *lakatoi* took in that year 57 shell armlets (*toia*), 2 pearl-shell crescents (*mairi*), 8 shell necklaces (*tautau*), and other trade. This vessel on her return voyage consisted of 10 *asi*, her cargo was about 25 tons of sago. In 1884 the largest *lakatoi*, consisting of 14 *asi*, returned with 34 tons of sago; it measured 59 feet by 51 feet. Two other *lakatoi*, each with 30 tons of sago, measured 54 feet by 37 feet.

The voyages were mainly to Gulf villages, and as the Motu required sago and the tree trunks for *asi*, only villages at the mouths of the rivers where there were sago swamps would serve their purpose. Toaripi was the nearest and the most important of these. Voyages were, however, undertaken to the vast sago district of the Purari River. Barton (1907, p. 6) says that the Kaimari tribe is the farthest westward of any tribe visited by the *lakatoi* fleet. Kaimari is on the west of the Purari Delta, up a creek from Port Romilly.

The villages that equip *lakatoi* are those of Port Moresby and the Motu villages to the west as far as Manumanu in Redscar Bay. All but two of these villages make pots and these buy their supplies from other villages. The women of Tupuselei, Gaile, and Kapakapa also make pottery and the men are first-class sailors, yet they equip no *lakatoi* and their pots are mainly bartered with the bush tribes for food. The use of these great sailing rafts, for such they practically are, is thus confined to a limited area and to Motu-speaking peoples, but there can be no doubt that the *lakatoi* is merely a development of a double canoe with a crab-claw sail. The absence of washstrakes and the more simple construction than that of the *orou* of the Mailu may be reductions due to different conditions.

The Toaripi of the Gulf, who made *lakatoi* similar to those of the Motu, used to pay return visits. They would arrive toward the end of the northwest monsoon and return with the beginning of the southeast season; thus like the Motu they sailed with a more or less following wind. Barton gathered that the customs in vogue by the Toaripi on *lakatoi* were similar to, but less strictly ceremonial, than on the Motu *lakatoi* and that they had adopted them from the Motu.

Barton (Seligman, 1910, p. 97) gives the legend of the origin of the *hiri*:

Edai Siabo, who very long ago lived at the Motu village of Bœra, west of Port Moresby, was instructed by Edai, a mythical being, how to make a *lakatoi* and to conduct a *hiri*, and he declared that when sailing on a *lakatoi*, instead of drums, they must use the *sede*, a bamboo percussion instrument. [This does not occur elsewhere, it is a cylindrical instrument with a free tongue, something like a jew's harp (Edge-Partington, 1895, pl. 197, no. 1). *Sede* are played only in connection with the *hiri*. The origin of the *sede* has long puzzled me, and I am now inclined to believe that it is derived from a bamboo bailer such as that from Nissan (fig. 73, *b*).]

EASTERN DIVISION

The official Eastern Division of Papua extends from Maopa to the southeast end of New Guinea and round the north coast to include Bartle Bay. For ethnographical reasons the mainland east of Mullens or Mullins Harbor, the north coast as far as Cape Nelson and all the groups of islands are known as the Massim district.

Mailu District

The Mailu-speaking tribes inhabit the islands of Mailu (Toulon Island), Laruoro, and Ainioro in Amazon Bay, and the neighboring district on the mainland from Cape Rodney (148° 23′ E.) in the west to Gogosiba in the middle of Orangerie Bay in the east. They are the most eastern of the western Papuo-Melanesians. The Aroma peoples are the link uniting the Mailu with the other members of the group. Influence of the culture of the southern Massim is more conspicuous among the Mailu as regards material culture and artistic production, but the social life is typically western Papuo-Melanesian, with its definite communities, patrilineal clans and patrilocal marriage, and it has been unaffected by the Massim culture. This is the most easterly limit of the double canoe with its crab-claw sail and the most westerly limit of an outrigger attachment by means of two pairs of undercrossed sticks. The language, however, is "Papuan" and Ray (Seligman, 1910, p. 25) says the Mailu language shows no trace of Melanesian grammar, though there are Melanesian words in the Mailu vocabulary. A grammar of the language is given by Saville (1912).

In 1914 I paid a visit to Mailu and made notes of the canoes; in the description I afterward wrote I was greatly aided by the Rev. W. J. V. Saville, the resident missionary. Malinowski (1915) has made an admirable detailed study of the Mailu, and Saville (1926) has published an extremely good description of the people and their culture. The following account is based on these three sources and on various photographs; where there is any discrepancy I follow Saville, as he is a practical sailor and has lived for many years among the people, and begin with an abstract of Saville's information regarding the various stages of canoe-making:

The Mailu have outrigger canoes for paddling and poling, the larger of which are fitted with a removable mast and sail; and they also have three kinds of double canoes. The outrigger canoes (*waona*) are simple dugouts with pointed ends. *Waona* are essentially similar to the *vanagi* of the Motu and allied tribes, and are without any carving (fig. 137). There is no washstrake, but there is a pole (*waona pou*) on each gunwale upon which the straight booms (*iado*) rest. In very small canoes the booms may be only four or five in number, in the larger they may range up to ten. The float (*larima*) is of about the same length as the hull; it is a simple log with a rough raked point at each end; it is attached to each boom by two pairs of crossed sticks (*gini*) which diverge slightly from each other; the boom rests on the crossings and is lashed to them. In some canoes there are accessory oblique sticks which

pass upward and inward from the float at the crossed sticks to be attached some distance along the booms. These oblique sticks are only used when stays are necessary to strengthen the attachments when the crossed sticks have to be higher than usual. There are usually two stringers (*larima pou*) near the ends of the booms; one is immediately inside and the other outside the crossed sticks. Occasionally there is another stringer across the booms not far from the hull.

FIGURE 137.—Canoes (*waona* and *orou*) at Mailu, Eastern Division, Papua (photograph by Kathleen Haddon).

The material used for lashings is the long, naturally twisted stalk of a creeping bush vine (*sinari, sinau* of the Motu). When a platform (*waona wawau*) is present it consists of a number of sticks, small saplings, strips of palm, or narrow planks, placed longitudinally across the booms near to the dugout and for a short distance outward. These rest only on the central booms and never extend to the fore and aft booms, and frequently the next booms are left free, in order to give the forward and aft paddlers the chance of paddling on either side of the dugout. The ends of these platform planks may be secured by a fore-and-aft transverse pole.

Malinowski (1915, p. 575) says that small outrigger canoes (*karo*) are made for the benefit of the boys; they are so small that no grown man could sail in them, but they are large enough to support one or two urchins. In these the boys sail within the reef, but sometimes venture farther out even in fairly rough weather and exhibit great skill and daring. Small accurate models of the *orou* are similarly made for the lads to play with in shallow water during the calms of the northwest monsoon season.

Poles (*wara*) are used for punting in shallow water. The paddles (*leva*) have lanceolate blades and very often are really well made and have slight carving on them. It is worth noting that toward the east the paddles improve and take the form, workmanship, and carving of the culture of the tribes farther east, Daui for example. The paddles of the Magi or Mailu are much more rude toward the west, as at Cape Rodney. The overlap of culture is thus also marked in the type of the paddles. Armstrong informs me that there is an overlap of the Daui type of canoe with the Aroma type at Velerupu, on the east side of McFarlane Harbor, and that the Mailu double canoes also reach this spot. He photographed at Daui a very small double canoe which was of the Aroma type.

There are three kinds of double canoe in the Mailu district:

1. When considerable carrying capacity is required for short distances, the hulls of two *waona* are fastened together to form a *gebo* by fitting cross poles or booms (*iado*) to support a platform; the poles are lashed to the hull in the same manner as the booms of an outrigger canoe. The *gebo* admits of a much larger number of paddlers, as they can sit in the hulls on the *iado* and paddle on the outer side of each hull. The space between the gunwales is so narrow that the knees of the paddler have to be crossed and the thighs overlap the gunwales.

2. The old war canoes (*bobore*) were built on the same plan as the *gebo*, but they were longer, more highly decorated, and built for speed. They were generally 35 to 40 feet long and carried 15 to 20 men. The hulls were of equal length. The fore and aft projections (*are*) were produced as far as possible with as much rake upward as the log would permit. From each bow a curved piece of wood was fixed which carried decorations and regalia of war. Its front edge bore the *toru*, which might be a white saucer-shaped piece of shell, or a wooden plate ornamented with red seeds, or two boar's tusks tied together; the *toru* were held in the mouth when fighting. Bunches of cassowary feathers were tied at intervals along the length of the curved piece and white *Ovulum* shells were fastened all along the outer and inner curves. A pole was fixed slanting backward on each stern. Fibrous tassels dangled from all the projections. No platform was laid down over the booms; on them were placed the 16-foot long spears and light soft-wood shields, and the long poles for use in shallow water. The headmen of the various clan clubhouses were the masters of the war canoes which had their distinctive names. The canoes were built of a light wood (*ilimo*). They were so deep that many of the men had to stand while paddling, while others rested one foot on the bottom of the hull, half sitting on the gunwale. These war canoes were used by the coastal villages west of Mailu Island.

3. The specialty of the Mailu Islanders is the large double sailing canoe (*orou*) for which they have a well-deserved reputation (fig. 137). The hulls are invariably made of the trunks of a large buttress tree (*moda*) by men of certain mainland Mailu villages who own the forests and possess the hereditary magical authority over the wood spirits. The technical and magical operations are vividly described by Saville, from whom I have received additional information. The islanders buy the roughly hewn dugouts and do the final adzing at home. The large clumsy hulls of the *orou* may be of equal size, but the one (*tauna* or *orou aura*, or simply *orou*) that carries the mast is often slightly larger than the other, which is termed *larima aura* or *larima* (as is the float of the *waona*). The ends are alike and are but slightly rounded; they rise obliquely from the under surface and are produced above to a projection (*are*) which is flat on its upper surface; rarely is it ornamented.

A deep washstrake (*sipa*) is lashed on to each of the four gunwales, this plank may be 28 to 30 feet long and 14 to 16 inches or more wide. The planks are made of softer wood than the hulls and their lower edges are adzed to fit the irregularities of the gunwales of the hulls. The two washstrakes of each canoe are connected fore and aft by a tall breakwater (*birisa, biritsa*). These breakwaters have some simple pierced carving and terminate in two scrolls. They stand on the *are* just in front of the point where the cavity of the hull begins. A *birisa* roughly represents a man's head, shoulders, and trunk. A secondary use of the *birisa* (as the word itself implies—*biri*, a room) is for the support, in the upper notch of the carving, of the long spars of the sail after it has been untied when arriving at anchorage. These spars form longitudinal supports on which the lower edges of the thatch can rest. The thatch (*laela*) consists of leaflets of the *nipa* sewn together to form two mats about 6 or 8 feet long; the tops are sewn together, so that they can be thrown over a temporized ridgepole (*ivara*). This is rigged up over the platform by tying it to three short poles (*laela ana*) which are set up on the bottom of both the hulls and lean inward against the inner strakes. A complete shelter is thus formed, for when at anchor on a voyage the crew rarely sleep ashore. When not in use, the *laela* can be neatly rolled up and thrown in the hold of a hull.

In building these canoes, the hulls, which are 30 to 35 feet long, or more, are placed parallel to each other about 4 or 5 feet apart. Holes are adzed out at intervals along the gunwales. The knees (*ae*), which consist of a right-angled fork of tough wood, are placed one pair amidships and a pair toward each end, with a limb of each knee lashed together from gunwale to gunwale; the other limb is vertical and holes are made to lash them to the washstrakes. The washstrakes are then lashed to the gunwales and to the knees.

Two tenoned poles (*lurau* or *lulau*) of equal length are mortised into the two inner strakes only, one fore and one aft (fig. 138), and the two hulls are forced as near together as the tenons will allow. To keep the two hulls firmly in that position until all the lashing is done, the two *are* are enclosed in a noose of strong rope and then the noose is twisted up upon

itself by means of a pole, which is then made fast. The object of the *lurau* is to keep the hulls equidistant and to prevent them from coming together in a seaway, and thus to relieve the tremendous strain on the lashings (*sinari*).

About 6 to 10 or even 12 booms (*iado*) connect the hulls for a distance equal to about half of their length; they pass through holes in the four strakes. These holes alternate with those for the strake lashings, and they are as nearly as possible in a vertical line with the holes in the hulls, down to which the booms are firmly lashed both inside and outside the strakes. The booms are produced about 2 feet beyond the outer strake of the *larima;* on the outer side of the *orou,* only the central ones, four to seven in number, are similarly produced; the others on this side are cut off as near the strake as the lashings will allow (fig. 138). The fore and aft oblique poles (*bona iado*) have nothing to do with the platform, but act as braces to keep the two hulls in the same horizontal plane in a seaway and to do for the actual dugouts what the tenoned poles (*lurau*) do for the strakes. One end of each *bona iado* is thrust through holes (*iado posi*) in both strakes which are so bored that the *bona iado* passes at an angle downward and forward so that the other end may rest on and can be lashed to the projection (*are*) of the other hull. When all the booms are in position the lashing begins, and thin poles or saplings (*pou*) are lashed longitudinally above and below so as to clamp the ends of the booms on each side; these are the *orou pou* and the *larima pou.* All this work is a community affair. When it is completed, the owner and his relatives give a public feast and the rest of the rigging of the canoe is his personal concern.

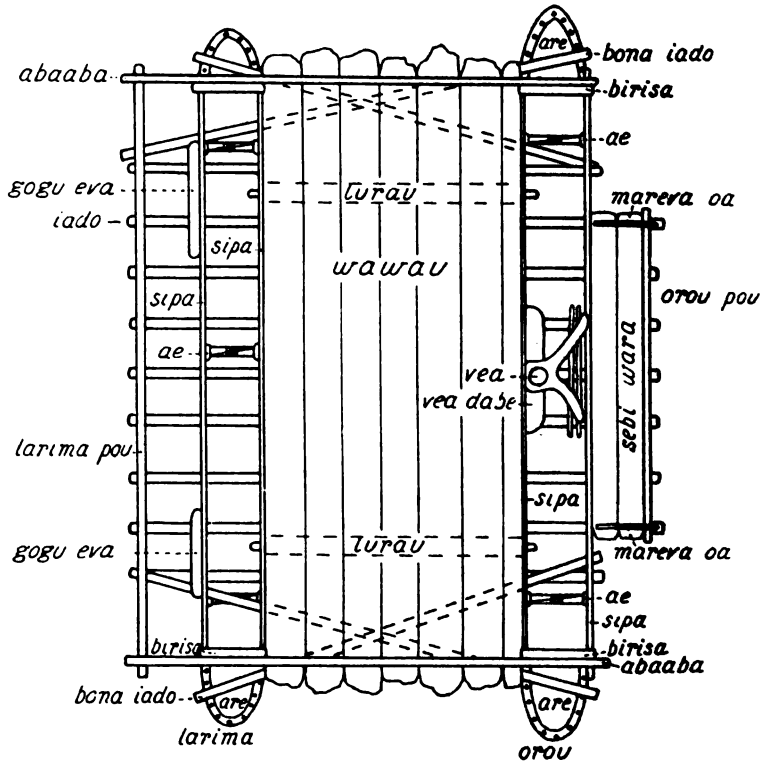


FIGURE 138.—Plan of a double sailing canoe (*orou*), Mailu, Eastern Division, Papua (after Saville, MS. and 1926, p. 131).

The platform (*wawau* or *vavao*) consists of longitudinal boards lashed over the booms between the hulls only. The ends of the boards are clamped between two transverse poles (*abaaba*), which may be flattened; these run in front of the *birisa* and extend from the outer strake of the *orou* to the *larima pou,* which they also clamp; they are also connected by a long lashing with the ends of the *bona iado.* A heavy log (*vea dabe*) is lashed longitudinally within the *orou* canoe over two central booms, or in large canoes over three, on this the mast is stepped (fig. 138).

Two shorter planks are lashed to the produced central booms (*iado*) on the *orou* side, and a longitudinal pole (*orou pou*) is tied above and below the ends of these *iado*. A vertical transverse board, or a curved piece of wood (*marewa oa*) is lashed to each end of this narrow platform (*sebi wara*). The board is generally carved to represent a bird, the head of which faces the sea. The neck of the rudder rests on the bird's back and is attached to it by a piece of rope. The platform also forms the stage on which the men stand when hoisting sail. No platform is built on the produced *iado* on the *larima* side, but longitudinally across them and between the strake and the *larima pou* are laid the long oars, poles, or other gear. Two short pieces of wood (*gogu ewa*) are firmly lashed fore and aft to the *iado* and close to the outer washstrake of the *larima;* to these the stays are fastened. The hold (*orou guni*) of a hull is not decked over. At each end of the platform a fireplace (*kau*) is made of laths of palm covered with clay and sand.

All seams, cracks, and holes are calked with *kaiso*, the calking material which is the scraped inner red surface of the bark of the *kaiso* tree, which is rolled up in the hands and moistened with salt water. It soon gets very hard and sticks firmly to the wood.

The washstrakes are often painted with simple designs. Sometimes the central part has merely vertical lines and the ends have circles, rayed circles or other devices (fig. 137).

The mast (*wea*) is cut from a strong sapling (*oailo*) selected for its lateral roots arising from small buttresses; the tap root is cut off and the buttresses cut at convenient lengths. The principal one, which has to take the great weight of the mast and sail, is firmly lashed to the *wea dabe;* the other buttresses rest upon longitudinal poles that lie by the inner side of the outer washstrake of the *orou* and are tied to the *iado* (fig. 138). These buttresses render a shoe unnecessary. A hole (*oraora posi*) is bored through the mast near the top for the halyards. The fore-and-aft stays (*gogu*) are of twisted strands of rattan; they really are one continuous stay which is looped in the middle for insertion over the mast above the hole; the thickening of the mast or an inserted small cross piece of wood prevents it from slipping down. The lower ends of the stays are turned back on themselves and bound so as to form a loop or "eye". Other strands of rattan are threaded through the eyes of the fore-and-aft stays; they are turned back on themselves and twisted into a very strong rope and their ends are tied respectively to the fore and aft *gogu ewa* of the *larima*, which is always to windward. These and many other details of an *orou* are clearly shown in Bernatzik (1935, pls. 65-74). (See also "The Illustrated London News", August 3, 1935.) The stays are often ornamented with streamers of the leaf sheaths of the coconut (*nunu*), as is occasionally the top of the mast, where the flag is called *lagi*.

Armstrong took a photograph of an *orou* at Domara, Cloudy Bay, which shows the deck roofing with the eaves resting on the sail spars, which in their turn rest on the *birisa*. It also shows the truncated roots of the base of the mast resting on the small platform (*sebi wara*) on the *orou* side and lashed to the *iado*. Malinowski (1915, p. 616) says that the mast is erected on the *tsebi* (*orou*) dugout close to, and sometimes practically upon, the small platform. His photograph (1915, pl. 28, fig. 1) in this respect resembles the foregoing. The arrangement as given by Saville is more typical.

Saville (1926) gives a detailed description and an illustration of the manufacture of the large and beautiful crab-claw Oceanic lateen sail (*ilo*), which is nearly twice the length of the mast (fig. 139):

It is made of strips of matting (*eba*) about 12, 15, or 20 feet long and 12 or 15 inches wide. The material is always split rushes (*eba*) which are prepared by the women, but the men do all the sewing and making of a sail. A stout hem is sewn over a continuous length of strong rope, or bolt-rope (*laea maru*), which runs around the periphery of the sail. The two peaks (*gege*) are strengthened by being bound with the fibrous sheathing from the young coconut leaf-butt. At short intervals down the two sides small pieces of the same material are doubled over the edge of the sail and sewn in position; these are to take the sail lashings, which consist of short lengths of thin rope (*laea maina*) tied around the edge of the sail for attachment to the spars. Each of the two sail spars (*isau;* upper gaff, *atana isau;* lower gaff, *auna isau*) is made of two, or even three, long saplings spliced together; they are much longer than the canoe itself.

When the owner is going to use the canoe the sail is brought from his house, unrolled and laid along the deck, and the two spars are laid along its sides. The peaks and the foot

are first tied to the spars. The spars have knobs (*loulou*) at their heavier ends to prevent any slipping of the rope that keeps them near together at the foot (fig. 140). The end of another, longer rope (*bo oraora*) is attached to the foot to bring it down to the base of the mast and is made fast to the base of the mast and to the *iado*, upon which the mast stands.

FIGURE 139.—Double canoe (*orou*) under sail, Mailu, Eastern Division, Papua (photograph by Kathleen Haddon).

The halyards (*deueu oraora*, "pulling rope") are generally two in number, but sometimes three. They are tied near the center of the longer spar or yard about two thirds distant from its lower end. Two long ropes are attached to about the center of the other spar or boom, one of which acts as a mainsheet (*atae*) and the other as a guy (*loroiri*) to prevent any possibility of the sail jibbing. The sail when being hoisted rises in a horizontal position; when the yard has reached as high as it will go, the foot is brought down by pulling on a rope (*bo oraora*) which is fastened to the foot of the yard; the rope is then made fast to the foot of the mast (fig. 140). The halyards are made fast to the *iado* within the *orou*, and the boom ropes to the ends of the *larima pou*. When the rudder is shipped and the mainsheet pulled in the canoe gets under way.

When tacking, they "about ship" (*doedoe*) by letting go the mainsheet; the sail hangs out free over the water in the breeze; the rudder is unshipped and reshipped at the other end of the *sebi wara*. What was the guy becomes the mainsheet and vice versa and what was the bow of the ship becomes the stern. The mainsheet is pulled in and the vessel gets under way on the other tack. In a fresh breeze the craft will travel at 8 knots. In a very stiff blow they shorten sail by undoing the lashings some distance up from the foot of the sail, and reef that part by rolling it up. To shorten sail further they reduce the peaks and the sail looks as if it had a square top. When the wind is blowing very hard indeed, and from behind, the halyards are made fast to the foot of the sail without any spars, and the foot drawn right up; poles are tied across the sail like yards, to spread it out.

The elongate-spatulate steering paddle or rudder (*mareva*) is about 10 to 15 feet long and about 20 inches in its widest part; from its broadest part it gradually tapers to a neck, then broadens into a circular head about eight inches wide. Through the broadest part of the paddle two holes are bored, through which are threaded the ends of a short piece of rope (*doi*), which are knotted or tied together. A pole or tiller (*mareva dora*) about 8 feet long is inserted through the noose thus formed, and the rudder is shipped in position with its neck resting edgeways on the *mareva oa* and securely lashed there; holes are usually bored through the latter for this purpose. The rudder lies obliquely with its broad surface against the side of the *orou*. The steersman stands on the *are* and holds the vertical tiller with one hand and pushes it out or pulls it in according to the direction in which he wants to steer; his other hand holds on to the *birisa* for support. When the canoe is under way, the rudder acts as a lee-board.

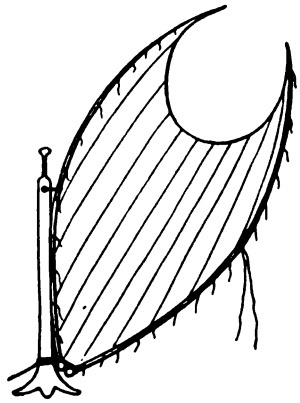


FIGURE 140.—Sail when hoisted, Mailu, Eastern Division, Papua (after a sketch by W. J. V. Saville).

The canoes are poled in shallow water. When becalmed in deep water the crew row with oars (*goga*). A temporary ring of rope or rattan is made and twisted into a figure-of-eight. One of the nooses thus formed is passed round the end of an *iado* and the handle of the oar thrust through the other noose; a rowlock is thus improvised and the oar rests on the *pou*. The men sit to row; the stroke is more of a jerk than a steady pull. Saville asserts that rowing is absolutely an indigenous art. The oars are of very rude construction and have practically no carving upon them, the shafts end off simply at the grip.

Saville (1926, p. 142) says, "In true sailor fashion there is nothing on our savage sailor's canoe but has its reason for being there, and therefore bears its own particular name." He adds that there are 115 named parts of a double sailing canoe.

Formerly each clan, or sub-clan, owned an *orou* which had its special ancestral name. The headman of the clan was the chief master of the canoe and his brother or uncle the second master (Malinowski, 1915). Saville says that one man may be the owner of the *orou* dugout and a near relative that of the *larima* dugout, but the former is more frequently referred to as the owner of the canoe. There is a communal use of the canoe within the sub-clan.

It is admitted by Europeans that the *orou* is the best sea-going vessel in the Territory. It is quite as fast and manageable as the *vaga* of the Massim, is more seaworthy in heavy weather, and can carry more cargo. It is able to sail close to the wind and makes but little leeway. It is the only permanent, built-up, double sailing canoe in New Guinea, or indeed in Melanesia, with the exception of New Caledonia and Fiji. The *lakatoi* of the Motu has the crab-claw sail, but this clumsy vessel which can travel only with a fair wind is a "tramp" and is rigged only for particular trips, whereas the great sailing double canoe of the Mailu is in almost daily use and can travel for miles against the wind.

Newton (1914, pl. p. 40) illustrates a *"lakatoi"* of Samarai, but this is certainly a Mailu *orou*; the same vessel is shown by him (pl. p. 44) with a sail reefed below and a man steering. A similar *orou* (pl. p. 124) shows the roof over the platform.

Macgillivray (1852, vol. 1, p. 287) saw in 1850 in Orangerie Bay a large canoe with "a triangular or latteen sail set with the apex downwards, thus resembling those in use on the north coast of New Guinea, among some of the Malay Islands, and those of the Viti Archipelago." The following terms are given by Macgillivray (1852, vol. 2, p. 322) for Dufaure Island (Mugula): canoe, *waga*; float, *sarima*; booms, *saeya*; connectives, *tuturi*; twisted lashing of booms, *mamadi*; paddle, *reha*; melon-shell bailer, *heko*.

Malinowski (1915) gives a most interesting account of the trading expeditions of the Mailu Islanders and Saville (1926) has a valuable chapter on the same subject. The Mailu were true traders, they not only exchanged their own products for the things they needed, but they were active middlemen between east and west. In the old days they traded with Aroma in the west, especially with the large village of Maopa, and with the Daui section of the southern Massim in the east, but they never went east of Suau Island (South Cape). Now they travel to the Louisiade Archipelago and the D'Entrecasteaux Islands. The various voyages always take place at stated seasons. Mullens Harbor used to be a great emporium for an overland trade route from Bartle Bay, to which area the northern Massim brought their goods. Saville (1926, p. 161) notes that the Mailu have introduced culture objects of one people into the district of another, but, except to a certain extent among the distributors themselves, the traded articles seem to pass through the tribes without making any very perceptible difference. Malinowski remarks that while some of the objects travel a long way to the west, the general influence of the Massim culture does not extend beyond the Mailu district.

Mr. R. H. Vigor took a photograph of a Mailu *orou* at Tupuselei and beside it a typical local outrigger canoe with forked booms. This is the most westerly record of a Mailu voyage that I know of.

Barton (Seligman, 1910, pp. 100 ff.) gives details about the two chief men of a *lakatoi,* who practice certain taboos; but the "mast captain" and the "sail captain" and the crew have charge of the vessel. Each chief appoints an *udiha*; generally he is the man's son and properly should be a boy who has not reached puberty, and he, too, becomes *helaga* (sacred). The *udiha* are also subject to taboos and are treated in much the same way as novices during initiation; it is not improbable that such they really are, although there are no initiation ceremonies among the Motu or among the Papuan Koita, who are now so mixed with the Motu. This and the great ceremonial attached to the *lakatoi* suggest that the immigrants who brought the double sailing canoe, which here developed into the *lakatoi,* had originally a definite initiation ceremony. In this connection it is interesting to note that Deacon (1933) records that at South-West Bay, Male-

kula, the construction of the old large outrigger canoe (*nimbembew*) was accompanied by payments of pigs and a ceremonial which resembled those for admission into a particular grade of the *nimangki* society.

The only well-equipped large double sailing canoe in New Guinea is the *orou* of the Mailu. Apparently in former days initiation among the Mailu was connected with the bringing back of heads after a fight. The lads who had to prepare the heads were secluded for two weeks in the *dubu,* subjected to taboos, and invested with the perineal band (*maila*) which at the end of the seclusion was replaced by the ordinary cord (*ivari*). Saville (1926, p. 109) adds that this ritual has long since ceased. Boys in the Mailu district who go through any initiation at all now undergo it on the *orou* during one of the big trips east or west. Malinowski says that it took place on an *orou* just after the canoes had returned from Aroma laden with pigs and areca nuts and before the big *maduna* feast.

Saville (1926, p. 196) was informed that the ancestors of the Mailu came from a hill near Waisina in the southern Massim district north of Farm Bay (Baxter Harbor); perhaps this was about 10 miles east of 150° E. One section migrated westward round the head of Mullens Harbor. The other was anxious to get to the sea as soon as possible, but as they could not acquire land for settlement on the coast, they traveled along the coast to Mullens Harbor, made rafts and went westward. Armstrong was told that the Mailu were the offspring of a snake that lived in the caves in the hills. It is not known how they reached there. Saville (1926, p. 197) adds: "The Mailu Island people and the villages they have formed west, in contrast to the hill folk, bear very little resemblance, physically, temperamentally and socially, to the Massim, but in the matter of houses, village construction, temperament and physical appearance bear strong resemblance to the Aroma people."

The two original chief men of Mailu were Waroula and Mailuula. Waroula lived at Woworo on the mainland and Mailuula lived on Mailu Island. Mailuula asked Waroula to make a canoe for him and said he would give coconuts, pots, and skirts in exchange for taro and sago. Mailuoura, the wife of Mailuula, was the first to make pots. Because the canoe had no sail, the islanders went to Bailebo River for rushes and Mailuoura plaited the rushes into strips of matting and Mailuula then made the first sail of the present design.

From Dedele, the east point of Cloudy Bay, westward, presumably as far as Aroma, the people knew nothing about making canoes. They have only recently learned from the Mailu how to make them and they naturally copy the Mailu types. This information is taken from Saville (1926, p. 197) together with later communication from him. According to Saville (1926, p. 165):

> The culture hero Tau, or Samudulele, originated this trading, and first introduced domestic pigs, coconuts, and sago to the Mailu and to peoples farther east. He was a native of Ubuau or Oilavanua and traveled in a small canoe east along the coast with his mother to the eastern part of Orangerie Bay, stopping for a time at various places as they went. At Veriveri, Tau substituted the eating of pigs instead of men at feasts. Before Tau's time there were no domesticated pigs except at Aroma, whence he came. . . "As far as I know anything of other Papuo-Melanesians along the coast, the name Tau is part of the title of their tribal hero. Tauhou and Taufou are found among the Southern Massim, while Taurama (the name of a big promontory on the coast just east of Port Moresby) was the Motuan legendary hero who started the *hiri.*"

Chalmers (1887, p. 33) gives this legend in greater detail:

> Keaura and Taurama, who were two brothers, had a terrible quarrel. Taurama with his wooden sword split Taurama (Pyramid Point, 8 miles east of Port Moresby) asunder and

sent Keaura (Cape Cupola, between Kerema and Freshwater Bay, Gulf of Papua) flying to the west. Keaura took the vegetable foods with him, leaving for Taurama arm shells, beads, wild yams, and bananas. Hence at Kabadi and to the west in the Gulf district there is plenty of food. Keaura and Taurama finally arranged that they should exchange their respective commodities, as is still done.

If these legends may be taken as evidence, it would seem that a people who had initiation ceremonies and made modeled (not coiled) pottery and were keen traders arrived in double sailing canoes somewhere along the coast between Port Moresby and Aroma. The Port Moresby branch got in touch with the Gulf people and started a mutually profitable trade. It was probably due to their influence that outrigger canoes and double canoes were introduced into the Gulf district. The Aroma branch spread their culture through Mailu to Orangerie Bay.

Apparently owing to a mistake in the German edition of F. Hurley's "Pearls and Savages" the late Dr. Margarete Schurig (1930, p. 65) states that coiled pottery is made at Port Moresby; this is not the case. The coiled pottery of the Mailu may be a later culture-spread from the Massim, and there are other examples of the influence of the Massim upon the Mailu. It should, however, be remembered that prehistoric sherds (Haddon, 1932-b) have been found in various places in the southeastern end of New Guinea which presumably were made by the coiled process. Nothing is known about the makers of this pottery or in what craft they arrived.

Massim District

The Massim district as first defined by me (1894, pp. 184, 218) was taken to extend on the mainland from Poura (Mullens Harbor) across the peninsula to Baunia (Bartle Bay) and included all the islands and archipelagoes adjacent to these coasts from the Trobriand Islands to Yela (Rossel Island). Seligman (1909-b, pp. 253, 268; 1910, p. 5) adopts this term, but according to E. L. Giblin the area extends on the north coast as far as the Cape Nelson Peninsula of Collingwood Bay.

The southern Massim of Seligman includes:

The area of the mainland Massim which extends from Mullens (Mullins) Harbor to East Cape, taking in South Cape (Suau Island) and Milne Bay (Tauwarra); the Brumer Islands; the Moresby group with the small islands Rogeia (Logea, Heath Island), Kwato, Samarai (Dinner Island), Sariba (Hayter Island); the Engineer group (Tubetube, etc.); Bentley Island; Wari (Teste Island). The Louisiade Archipelago: Misima (St. Aignan), Panaieti (Deboyne Island), Calvados chain (Utian or Brooker Island, etc.), Pana tinani (Joannet Island), Coral Haven, Tagula (Sudest Island), Yeiana (Piron Island), Yela (Rossel Island).

The D'Entrecasteaux Islands: Duau (Normanby), Dobu, Moratau (Fergusson), Morata (Goodenough). These with the Louisiades and other islands and the mainland are included in the southern Massim by Seligman.

The northern Massim of Seligman includes:

Egum Atoll; the Alcester Islands (Tokunu, etc.); Nada (the Laughlans or Lachlans); Murua (Woodlark); Marshall Bennett Islands; Trobriand Islands (Kiriwina, etc.) and Lusancy Islands; the Amphlet Islands.

There are many references in scattered publications to the sea craft of the Massim district which can not be noticed. Most of them are almost valueless or repeat what others have said. The following account is culled from various published and unpublished sources. I have quoted Macgillivray freely, as he was an extremely careful observer and was the first to describe the canoes of the area.

Owing to the fact that the larger sailing vessels are manufactured in only a few spots, whence they are traded far and near, and also to the constant visiting that takes place between various islands there is likely to be a considerable uniformity in these vessels. A canoe which has been seen in a certain place is not necessarily a local type. Thus it is not easy to determine the original area of the several types.

A sketch of the ethnography of the Massim was given by me in 1894 (pp. 184-245), Seligman (1910, pp. 276-746) has given a most valuable monograph on certain Massim peoples, and the memoirs which are referred to below also give details concerning special areas. There is a good deal of scattered literature on the subject, especially in the Annual Reports of the Territory.

No one who has visited the Massim district has attempted to compare in a systematic manner the varieties of the canoes to be met with there, but thanks to the publications of Macgillivray (1852), Abel (1902), Seligman (1906, 1909, 1910), Jenness and Ballantyne (1920), Malinowski (1922), and Armstrong (1928), it is now possible to gain a general idea of the craft, though there are still many gaps in our information.

A number of travelers have referred to the catamarans of the extreme southeast of New Guinea and the adjacent islands. Macgillivray (1852, vol. 2, p. 255) has given the best description of them. The small ones at Brumer Island consist of three logs or planks lashed together; the central one is the longest and may be slightly carved and colored at the ends. A common length is about 9 feet; others capable of carrying a dozen people with their effects are much larger (1852, fig. p. 256). Finsch (1914, p. 476) says that rafts of three or four trimmed beams, 3 to 4 meters long, tied together, could carry one to three persons. These were most often seen by him from Wari to Cape Frere (Bartle Bay), in Milne Bay, and in Christmas Bay on Duau (Normanby Island). In his earlier book (1888-a, p. 231, fig. p. 232) he says they consist of three dressed quadrangular tree stems 4 to 5 meters long and about 1 meter broad, bluntly pointed at each end. Abel (1902, p. 64) says the *eauga* of China Strait "is used close to the shore for fishing . . . It consists of five light pieces of wood, about six inches in diameter, tapered at the ends, and strongly lashed together with cane." Baden-Powell (1892, p. 153) saw at the Killerton Islands at the north entrance to Milne Bay catamarans of three or more logs of light wood lashed together, on which a couple of men kneeled to paddle. At Annie Inlet, Bentley Bay, he (1892, p. 182) noticed that when not in actual use the logs were kept separated so that the light porous wood might get thoroughly dry. Armstrong informs me that catamarans are met with from Milne Bay to Taupota, west of Awaiama Bay. Seligman has a photograph of a narrow elegant catamaran of Wagawaga. It has sharply pointed raked ends and looks like a miniature canoe with low strakes.

DAUI AND SUAU AREAS

(Mullens Harbor to South Cape, thence nearly to Samarai)

Le Hunte (1900, p. 13) was the first to remark that at Fyfe Bay there was a new type of sailing canoe. He says (1901, p. 39):

> "I saw a large sea-going canoe at this place, which was curiously ornamented on the side with carvings representing some novel marine animals, large fish with the body of an albacore, and the head of a long-necked bird, and in one case that of a turtle; there were also large fish shaped like a boy's kite in a harlequin pattern. The natives informed me that the canoe was built here. . . The principal artificer was dead. The designs were probably brought from the east. One gets here too the lozenge-shaped canoe sail."

Higginson (1922, p. 53) writes:

"The coastal people [from Mullens Harbor to Samarai] . . . are a seafaring race. Many years ago they were builders of the large sea-going canoes, but this seems to be a lost art now, and for many years past canoes have not been built, the occasional ones that one sees being acquired by purchase."

W. E. Armstrong has given me information about the *waga* of the area between Mullens Harbor and South Cape, all of which had the same general construction.

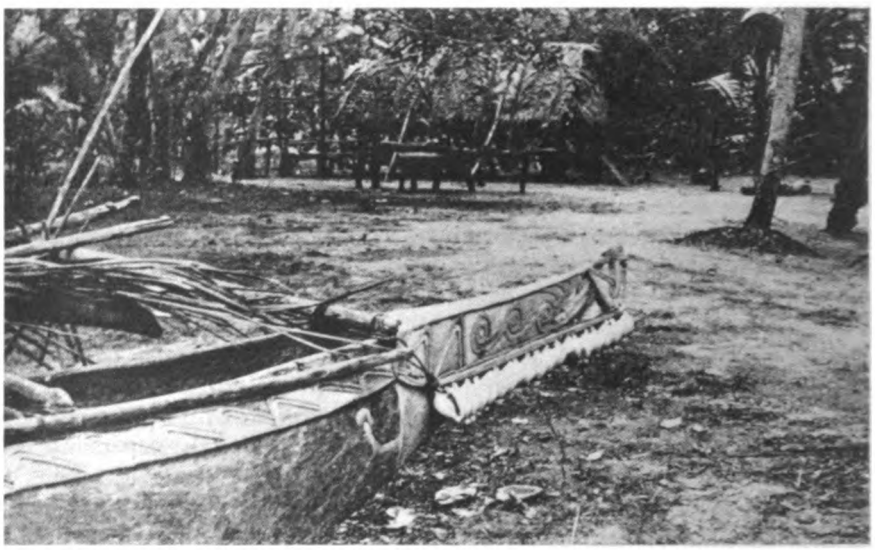


FIGURE 141.—Fore end of a canoe, Delami Island, Massim (photograph by W. E. Armstrong).

At Sakari, on the south coast of Bonarua Island at the mouth of Mullens Harbor, were narrow dugouts, many with a shelf at each end; a gunwale pole might be present or absent. The smaller canoes were plain and in some the ends and center of the hull were painted black. The greatest width of the dugout was about 1 foot and its opening about 6 inches. Those measured were from 16 to 22 feet long. Some canoes had a more or less vertical stick springing from the connectives of the end boom, which might have a *Nautilus* shell at its end or sometimes a crescent cut from the husk of a coconut (a wooden crescent is found in some Louisiade canoes in the same position); below this was a fringe of coconut fiber.

At Delami Island, south of Bonarua Island, one canoe, which was 25 feet long and had 10 booms, was decorated with typical Massim carving. In all these canoes the fore and aft booms were near the ends of the hull, were slightly farther from the adjacent booms than these were from each other, and were free; the platform of longitudinal poles covered the outboard length of the eight central booms, its average width being 2 feet. The narrow float was as long as the hull. The attachment consisted of two pairs of divergent undercrossed sticks.

This type of canoe is characteristic of the Daui area and with slight modifications it extends from Yadaisiu (Gadaisu), in the center of Orangerie Bay, to Tagula.

Canoes in Fyfe Bay, according to photographs by P. de Rautenfeld, are precisely similar to the foregoing, as are the smaller Daui-Suau canoes. The larger canoes (fig. 141) have a decorated strake, and rather small breakwaters; the elongated, horizontal projections of the ends of the dugout are carved in the Massim fashion and ornamented with *Ovulum* shells, fringes, etc.

Chinnery sent me a sketch of a model of a paddling canoe (*waga*) used by the Suai-aro of Bonabona, a village on the north coast of Bonarua Island (fig. 142, *a*):

The dugout is long, thin, and sharply pointed at each end, there is a narrow strake (*waga tipa*) on each side; the breakwaters are of the same height as the strakes and are at some distance from the ends of the dugout. Six evenly spaced booms (*sai-ia*) pass through one side of the dugout. The float (*sarima*) is as long as the hull; the attachments consist of two pairs of undercrossed sticks (*tuturi*). A large continuous platform (*patapatari*) of closely laid poles stretches across all of the booms.

Armstrong saw a sailing *waga* at Bonarua which was made at Koilo in Murua. It had two strakes (*bodcai*) on each side, and along the lower strake were ten painted fish. These *waga* have individual names. The breakwater in the Suau language is called *balagai* and the end-erection, *tabule*.

Some photographs lent to me by Seligman of a small undecorated sailing canoe at Bonabona show the following characters:

The ends of the dugout are produced to a rather long point, on the top of which a triangular flat board is fitted to form a shelf; there is a low washstrake on each side with low breakwaters. The nine booms rest on one edge of the dugout and on two internal longitudinal poles which are lashed, one on each side, to the strakes and the dugout. There do not appear to be any knees. The float is as long as the hull; at each end is a tall stick with a fiber tassel and *Ovulum* shells. There are the usual two pairs of undercrossed sticks. The main platform consists of longitudinal poles over all the booms, except the two outer ones. On the off side is a small square platform supported by two poles that stretch over the strakes and the main platform, where they probably form the foundation for the mast-shore. The mast is stepped forward of the center of the hull on short longitudinal poles that are lashed beneath two booms; it is steadied by a strong, slightly curved mast-shore which rises from the main platform and is bound round with rope. The mast has the usual prong and has a long thin vertical stick tied to its end.

The pandanus leaf sail has the typical long straight sides and rounded ends which are bent on themselves to give a double thickness. There are two shrouds. The halyard is fastened to about the center of the yard, it passes through a hole in the base of the prong and is tied below to the mast-shore. There is a vang at each end of the yard, and a sheet at each end of the boom and another at its center. A rope is fastened to the center of the lower convex end of the sail.

The small paddling canoes differ only in having a lath on each side of the gunwale over which the booms are lashed; there are no strakes.

Armstrong has given me a description of an *amuiuwa waga* which was made at Silosilo, at the end of Gabususiaru Bay (west of Fyfe Bay). He says it was made by the only Orado man who knew the art, which is completely lost among the Suau (1921). This man made it all by himself, except for a little of the preliminary heavy work, and it took him about one year; he had made two previously. He performed the *u'ula* rite, chanting a spell, usually accompanied with chewing certain plants, over the paint before putting it on the fore end of the dugout and other carved parts of the canoe, and also performed *u'ula* for fine weather. No small feast (*mata'asi*) was given during construction or at completion. Such a *waga* is paid for mainly in arm-shells, stone ax blades and other valuables.

The white paint (*belam*) is prepared from calcareous algae and is at first yellowish but turns white; it is painted all over the strakes and on some of the carving of the dugout. There are three strakes (*bodai*) on each side of the dugout (*oiagi slegan; oiagi* is wood), which is 35 feet long and about 1 foot deep; the ends projecting beyond the strakes are solid. The bottom strake (*oiago tamonan*) is the broadest, and the topstrake (*oiagi madawe*) the narrowest (fig. 142, *b*). The lashings and seams are calked. The flare of the strakes gives an opening of 4 feet in the center of the canoe.

The breakwaters are carved and painted and rise well above the topstrakes. The strakes are supported by numerous pairs of L-shaped knees of which the short limb rests on the edges of the dugout and the long one reaches to the top of the topstrake; these limbs are perforated at half the height of the middle strake and thin lateral longitudinal poles pass through these holes from end to end of the hull.

The ten booms (*soisoi oiagi*) penetrate the middle strake, lie upon and are tied to the longitudinal poles, and their ends abut against the middle strake of the off side. The float (*salima*) is 18 inches broad and 21 inches deep; its lower border is 3 feet distant in height from the platform and 5 feet from the edge of the topstrake. There are two pairs of divergent undercrossed sticks (*tuturi*) for each boom; the booms are 2 feet apart. The platform (*bata-batari*), which is 6 feet wide, consists of 45 thin poles (*nainaiwe oiagi*) laid longitudinally over all the booms. The outermost pole which is over the outer connectives is much thicker than the others, as are also the two poles nearest the hull, which have a short transverse piece of wood over them above the booms. There are transverse poles below the platform to strengthen it, they lie halfway between the booms and are bound by continuous lashing to the *nainaiwe;* they are not attached to the hull.

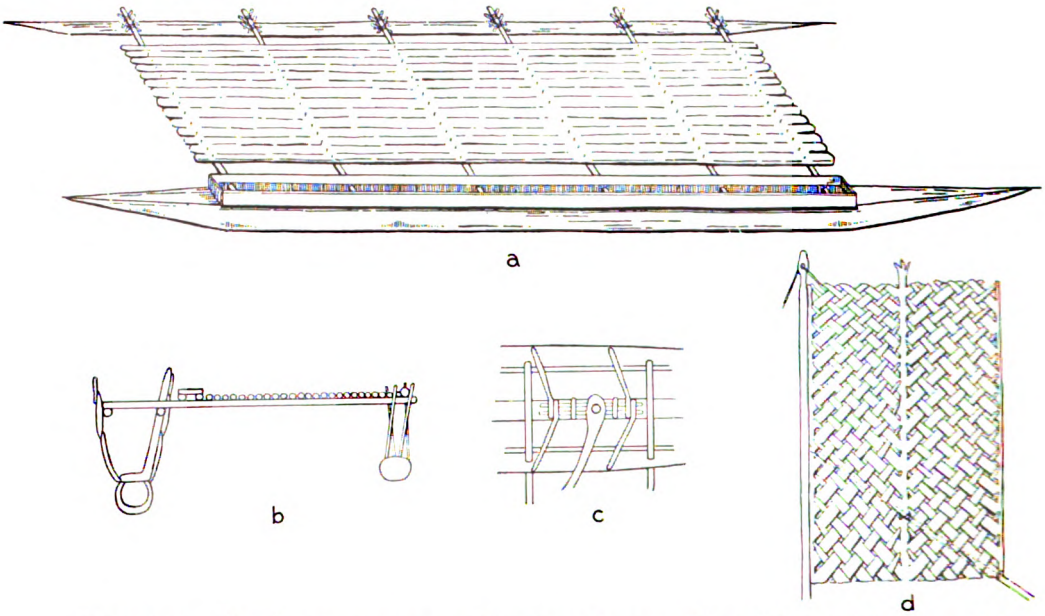


FIGURE 142.—Massim canoes: *a, waga,* Bonabona, Bonarua Island (after sketch of a model by E. W. P. Chinnery); *b, c, amuiuwa waga* at Silosilo, section through hull and outrigger, and interior view of hull showing shoe-spar (after W. E. Armstrong); *d,* plaited leaf sail with mast and mast-shore, small sailing *waga,* Isuisu, east of Fyfe Bay (after a photograph by W. E. Armstrong).

The mast is stepped in a shoe-spar (*kokoilo*). The perforated shoe portion is placed between the two central pairs of knees and rests upon and is lashed to a pair of short thin central longitudinal poles which are fastened to and beneath these knees; a short transverse bar of wood is lashed above these poles between the shoe and each pair of knees (fig. 142, *c*). The spar of the shoe is about 10 feet long and has a carving (*doha kumkum*), like a *kum-kum* bird, at its free end, where, according to Armstrong, it is tied on to the top of the out-rigger. The sail (*vorevore*) is made of *eba* and is approximately 25 feet long and 9 wide.

A small sailing canoe (fig. 143) sketched by Armstrong at Isuisu, a village east of Fyfe Bay, had the same construction as the Bonarua canoes:

The mast (*haiari*) was stepped near the free end of the foremost boom of the platform. The stay (*barai*) was rove through an eye at the masthead; its fore end was tied near the end of the fore (free) boom and its aft end to the end of the third boom of the platform.

The mast was supported at about half its height by a mast-shore (*haiari*), the other end of which was lashed close to the hull between the first and second booms of the platform. The vertical oblong sail (*vorivori* or *parapao'tiotilipa*, as this particular kind of sail is termed) was made of coconut palm leaves (fig. 142, *d*). The midrib (*uluhuna*) of one leaf was in the middle line of the sail and its leaflets were interwoven on each side with those of the half of another leaf, of which the split midrib formed the vertical lateral borders (*ewawai*) of the sail, one of which apparently was fastened to the mast. The outer border had two lines or guys (*enainawa*) attached to its lower third; of these one was tied within the hull near the off end of the fore boom of the platform and the other to the platform at its second to last boom. The mast-shore was tied to the *uluhuna* and to the lower end of the outer *ewawai*. Armstrong sketched nine booms (*iado*), but ten or some even number seems to be usual; connectives, *tutuli* (*buabua*, Daui); float, *sarima;* platform, *patapatari;* longitudinal pole over booms on off side of hull, *ahau*; paddle, *wose*. These terms are in the Suau language.

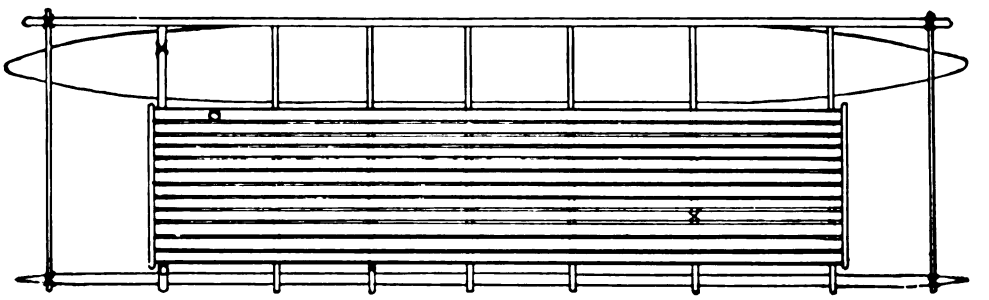


FIGURE 143.—Plan of small sailing canoe, Isuisu, east of Fyfe Bay, Massim: *o*, position of mast and mast-shore; *x*, attachment of the guys (sketch by W. E. Armstrong).

Suau and Daui are dialects of one language. Suau is spoken from a little west of Suau Island (South Cape) to a little east of Samarai, Daui from a little west of Suau Island to Mullens Harbor. These dialects gradually change from one into the other.

A plain Daui canoe with ten booms (fig. 144) is of the type common to the area and the outer booms are quite free from the platform. The mast is stepped amidships and is supported by a mast-shore that arises from the middle of the platform. The sail is composed of several leaves of the coconut palm, the leaflets being interwoven; there are a yard and a boom. The halyard is tied to about the middle of the yard and is rove through a hole in the prong at the masthead; at the end of the prong is a carved bird. A vang is tied to the lower end of the yard. There appear to be two ropes (sheets) tied to the boom. There are two stays. Armstrong terms this a "temporary plaited coconut leaf sail," but it is of a more seamanlike construction than that of the Isuisu canoe (fig. 142, *d*) which evidently is the sort of impromptu rig recorded by Abel and referred to later, for Abel mentions a makeshift mast, whereas this Daui mast is the normal one of this area.

Lindt (1886, Album 4) published photographs of several canoes of the South Cape region. At "Farm Bay" (Baxter Harbor) (photographs 91, 92) is a long canoe with the ends of the dugout prolonged, carved and ornamented with *Ovulum* shells and a fringe beneath; there are no strakes but a gunwale pole is present. The platform is continuous over all the ten booms; one long connective at each end of the platform rises high above it and may have a crescent at the end. Another canoe is quite plain with a flat shelf at the bow, immediately behind which is the first boom. There is no gunwale pole and the platform begins at the third boom. At Bertha Lagoon (photographs 90, 94, 96) the canoes also tumble home

so as to leave a narrow opening, they are quite plain. In one the rounded bow has a horizontal shelf; in another the bow is produced into a horizontal spur and the aft end is produced into a slightly rising "duck-bill", with a concave upper surface. There are no gunwale poles or strakes. There are five to nine booms which do not project on the off side; they extend from one end of the hull to the other, and thus the float is very long. There are two pairs of undercrossed sticks, but in one canoe the bow boom has only a single stick connective. The platform seems to be of split palm wood and forms a close decking over the central booms; the fore and aft booms are always quite free. In one canoe with nine booms the platform covers five booms only. The paddles are of the ordinary Massim type. The illustration given by Chalmers (1887, pl. p. 196) is probably adapted from these photographs.

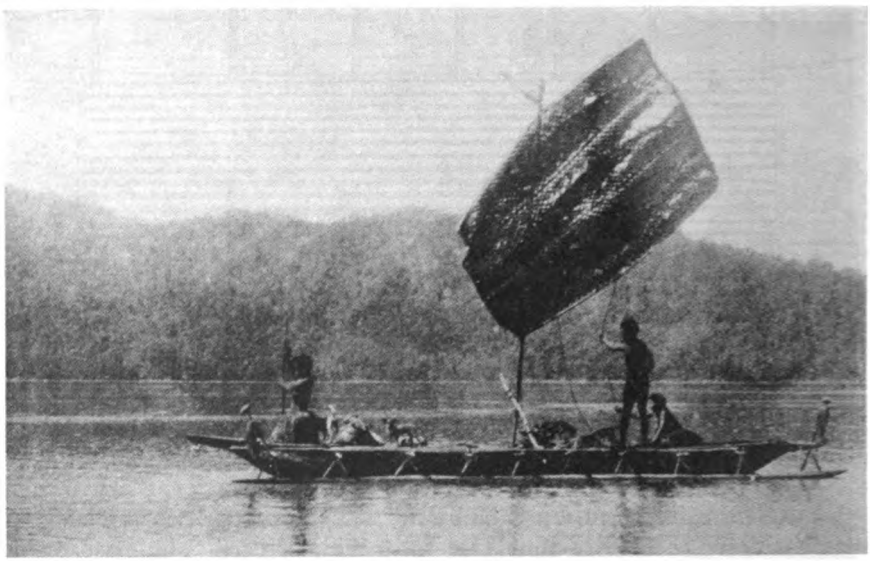


FIGURE 144.—*Waga* of Daui with interplaited coconut-leaf sail fastened to a yard and boom and rigged in the typical Massim manner (photograph by W. E. Armstrong).

Photographs of canoes of this area from other sources show the same general character. A stringer may be present outside the attachments and a photograph given by Newton (1914, p. 276) shows two stringers at the attachments. The freedom from the platform of the fore and aft booms, and sometimes of the next booms, is characteristic of the Mailu *waona*; the occasional covering of all the booms by the platform is due to more pronounced Massim influence.

Recently F. E. Williams has given me information about a sailing canoe (*amuiua*) made by a man of the Suau area who had learned the trade while living at Orado near Misima. Similar canoes are sometimes made in the Suau area. They are usually said to be copied from those of Tubetube and are claimed to be identical with the canoes of Murua. The structure of this canoe conforms in all essentials with the description of a typical *waga* which is given later:

> The dugout is 33 feet from tip to tip. There are three rows of strakes (*bodeai*) which splay outward to a height of about 3 feet 6 inches. At the center the gunwales are approximately 5 feet 6 inches apart, but at each end where they meet the breakwater they are about 1 foot 6 inches apart. The strakes are bound to each other and to the dugout with *oriu* twine and the seams are calked with the gum of the *aibadi* tree. There are ten pairs of knees (*geru*)

with a hole in their center for the longitudinal pole (*to 'ewa*) (fig. 145, *b*). The breakwater (*baragi*) is somewhat of the Murua type; the end-erection (*taburi*) is a mixture of types 1 and 3. [See summary, pp. 275-278.] There is a tang at the summit for a finial (*riri* or *lili*) which is not visible in the photograph (fig. 161).

The ten outrigger booms (*iado*) pass through the central strake on that side and rest on the longitudinal poles, to which they are lashed. A flooring of loose boards is placed inboard on the booms. The float (*sarima*) is attached to the booms by the usual two pairs of undercrossed sticks (*tuturi*).

The central mast (*paiare*) is stepped in a socket in the shoe-spar (*duaduari*) (fig. 145, *a*). The shoe portion is made fast to several thwarts; the spar portion extends over the platform, where it is supported by two pairs of long undercrossed sticks the lower ends of which are inserted into the float; presumably it is bound to the gunwale. A Y-shaped pole (*soasoa*) is lashed by its stem to the mast at about the level of the gunwales, the fork embraces the shoe-spar over the topstrake and wedges (*enamo*) are driven in the angle of the fork. Williams says that this is to force the mast to incline farther to the left.

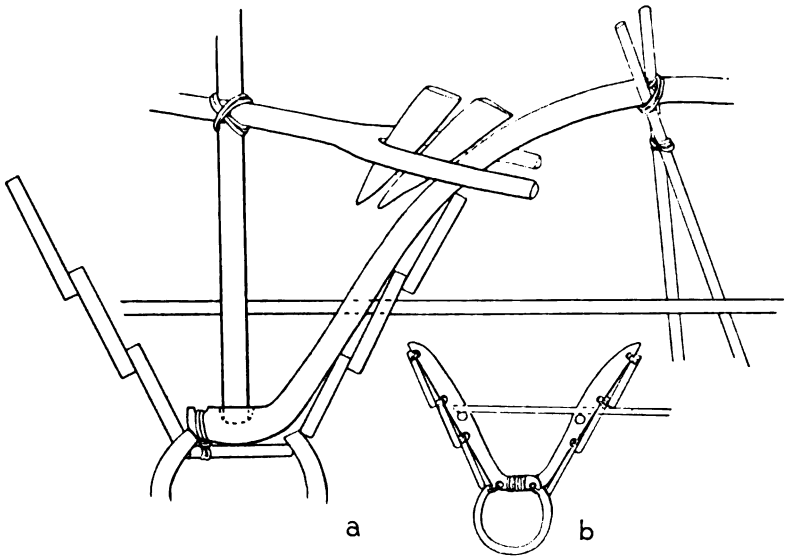


FIGURE 145.—Sections through a sailing canoe (*amuiua*), made by a Suau man in the Misima manner: *a*, method of attachment of shoe-spar; *b*, knees and position of boom (sketches by F. E. Williams).

SAMARAI AND NEIGHBORING ISLANDS, AND MILNE BAY

According to Abel (1902, p. 61) there are in his Mission district, comprised of the islands Rogeia, Kwato, Samarai, and the coast line of Milne Bay, four classes of vessel: canoes without outriggers, *gebo*; outrigger canoes including 1, the war canoe (*tavero*), 2, canoes of various sizes which can be sailed (*vaga*), 3, large built-up sailing canoes (*vaga-ue*).

The *gebo* (Abel 1902, fig. p. 63) are almost entirely confined to Tauwara (Milne Bay), Wagawaga being the center for these canoes. Some of the dugouts are more than 60 feet long and will hold 16 paddlers. A cedar tree is felled and hauled to some convenient place in the bush and there adzed into the lithe and elegant shape of the *gebo*:

> The "stone adze has a moveable head, so that in scooping out the sides of the canoe, which are concave, the adze head may be turned to either side of the handle. This enables the workman, while striking straight down, to effect the hollowing-out of the canoe. Generally, the

Papuan prefers his own adze for this very particular part of the work; he gladly, however, avails himself of the sharp steel hatchet and adze of civilization, for doing the straightforward part of the operation, in the centre of the canoe. The stem and the stern of the *gebo* are tapered off with very delicate lines, and some of the finest Papuan carving is to be found upon the thin tall prows of these vessels. [Abel probably refers to the end-erections of the *vaga-ue*; there is no other evidence of their being affixed to the *gebo*.] The *gebo* is very rarely used as a sailing craft. It is essentially a very fast paddling canoe. . . A good crew will propel the *gebo* at a rate exceding five miles an hour."

Finsch (1914, p. 476) says he frequently saw at Samarai and in Milne Bay, in 1884-85, large dugouts (*gebo*) up to 30 feet long, without an outrigger.

According to Le Hunte (1900, pp. 23-24), at Waimara in Milne Bay "They use long narrow canoes without any outriggers, which they paddle, either sitting or standing, with great dexterity. . . . Their canoes [at Wagawaga, Milne Bay] are fine—one we saw was sixty-five feet long with carved ends; on one there was a representation of a European firing a gun from a sitting posture at a large bird (pelican?) which was protecting a young one behind it; they have no outriggers or sails; the natives often cross the China Straits in them."

Seligman (1910, p. 527) states that at Wagawaga in 1904 "no *waga* were to be seen, but many small canoes and a fair number of long, narrow dugouts, without sail or outrigger, boats that could carry little or no cargo but could transport a comparatively large number of men for a short distance at a relatively high speed." In the old days these boats were used in raids.

1. The *tavero*, or war canoe, was similar to the *vaga*, but larger. Abel (1902, p. 61) says: "During the past ten years it has entirely disappeared in this part of the country." Powell (1883, p. 17) speaks of very long canoes at Possession Bay, Sariba (Hayter Island), "holding about thirty men each, the outriggers hung with shields and bundles of spears." Macgregor (1890, p. 27) saw "some fine canoes at Logei [Rogeia]; two of them, for warlike purposes, are over 70 feet long, and seated for twenty-five rowers. They procure them from Maivara and Wagawaga in Milne Bay." These may have been *gebo*.

2. The *vaga* is propelled by means of paddles and is made out of a solid log, slightly tapered at both ends. The float of the single outrigger is as long as the hull, from which it is 4 feet distant. Each of the numerous booms is attached to the float by means of two pairs of undercrossed sticks. The booms support a spacious platform made of strong rattan laths. Abel (1902, p. 63) remarks:

"If a dead fair wind favours the voyagers, it is only the matter of a few minutes to paddle the craft in shore, cut an impromptu mast from the thick bush along the coast, scale the cocoa-nut-palm tree and hack off two long leaves, plait these together for a sail, re-embark and up stick and away down the coast at the rate of three knots an hour."

In the *vaga* without a sail figured by Abel (1902, p. 62) there are nine booms, seven of which support the platform, the two end ones being quite free. There is no washstrake, but there appears to be a pole on each gunwale on which the booms rest. The *vaga* is commonly used, in moderate weather, for short passages and for going out a few miles at sea to fish. In fine weather with light winds they are often used for expeditions of from 10 to 20 miles along the coast. They hug the shore all the way so that if bad weather sets in the voyagers can haul the *vaga* up on the beach of some quiet bay. Macgillivray (1852, vol. 1, p. 256) says:

"The canoe[*waga*] of this part of New Guinea [the Brumer Islands, east of South Cape] is usually about twenty-five feet in length, and carries seven or eight people. It is made of the trunk of a tree, hollowed out like a long trough, roundly pointed at each end, a foot and a half in extreme width, with the sides bulging out below and falling in at top, leaving only eight

inches between the gunwales which are strengthened by a pole running along from end to end. The ends—which are alike—are carved like those of the catamaran in imitation of the head of a turtle or snake, but more elaborately. The outrigger consists of a float [*sarima*] as long as the canoe, attached by small sticks or pegs let into the wood to eight or nine supporting poles [booms, *sai-ira*], the inner ends of which rest in notches in both gunwales, and are secured there. A portion, or the whole of this framework, is carefully covered over with planks or long sticks, and occasionally a small stage is formed on the opposite side, over the centre of the canoe, projecting a little outwardly, with room upon it for two people to sit and paddle."

The canoes seen by Macgillivray (1852, p. 257) were provided with only a small temporary sail (*doro*) made by interlacing the leaflets of a coconut palm leaf and "stuck up on poles when going with the wind free." The paddles (*wosi*) are like those of the Louisiades "with spear-shaped blades and slender handles, but are larger—measuring six feet in length—and of neater construction, the end of the handle being carved into some fanciful device." The bailer (*aruma*) (Macgillivray, 1852, fig. p. 261; Edge-Partington, 1895, pl. 291, fig. 6) is scoop-shaped, made of wood, with an inwardly projecting handle.

Lindt (1886, Album 5, pls. 111, 114) shows well-built sailing canoes at Samarai (Dinner Island):

One has three strakes, the middle strake has a row of fish designs; a thin pole is laid over the topstrake. The bow and stern are decorated in the usual Massim fashion. The central mast has a prong near the top and is supported by fore-and-aft stays. One seems to have 11 booms with two pairs of undercrossed sticks, the thick float is as long as the hull and the ends slope gradually upward and terminate in carved birds. The platform extends over all the booms and is composed of longitudinal poles; it is further supported by transverse poles between the booms; a stick with streamers stands up at each end. The projecting portion of the shoe-spar is supported by a pair of tall undercrossed sticks and its end is connected by cords to the outer margin of the platform. The central mast is steadied by fore-and-aft stays; it has a prong at the end for the halyard, the end of which is connected with the mast by a string.

3. Abel (1902, fig. p. 65) says:

"The *vaga-ue* is a huge clinker-built vessel, constructed on very fine lines, and capable of very fast sailing, even when close-hauled on the wind. . . . The *vaga-ue* carries one enormous, lozenge-shaped [flat oval], mat sail. It takes the sailors a long time to hoist this heavy mat. Only one man hauls on the halyards, the rest assist by lifting the unrolling sail with long poles until it is properly set. They do not put their ship about as we should, they merely cant the sail the opposite way, and carry the portable rudder to the other end of the vessel. . . . [It is] an exceedingly smart vessel, which needed skilful handling."

Macgillivray (1852, frontispiece and pp. 267-69), saw a large sailing vessel which visited the Brumer Islands when he was there in 1849. It had 26 people on board. In addition to ordinary paddles there were two of large size which were probably used for steering; they were pulled as oars with cane grommets on the gunwale. The length of this vessel was about 40 feet. He describes it as

"constructed of a hollowed-out tree raised upon with large planks forming a long coffin-like box, closed with high end boards [breakwaters] elegantly carved and painted. Two rows of carved fishes ran along the sides, and both ends were peaked, the bow rising higher than the stern, and, like it, but more profusely, decorated with carving painted red and white, streamers of palm-leaf, egg-cowries, and plumes of cassowary feathers. The outrigger framework was completely covered over, forming a large platform above the centre of which a small stage rested on a strong projecting beam [shoe-spar] the outer end of which was carved into the figure of a bird, while the inner reached to the centre of the body of the canoe, and served to support the mast. The planks forming the sides were strongly supported by knees where each of the ten or twelve outrigger poles passes through one side and rests against the other, and some loose bottom boards form a partial shifting deck. The mast is supported above by two stays fore and aft, and below steps into a massive bent timber crossing the centre of the canoe, resting on the bottom, and is secured above to the inner end of the long cross beam by strong lashings, and

some large wedges between it and one side. The sail is of great size, being as long as the platform, but both in construction and mode of management is precisely similar to that formerly described."

I shall point out later why I think that this vessel was on a trading voyage from the Calvados Islands. Macgillivray saw also a smaller, similar canoe, but with great breadth of beam amidships.

Powell (1883, p. 24) says that the oval sails of large canoes of the China Straits "are made of mats of different sizes, a large one for fine weather, a small one for strong wind, and a very small one for a gale. In going about they have only to haul down the other end of the sail, and shift the steering paddle; they lie close to the wind and sail very fast." Finsch (1914, p. 476) says these are called *wem* at East Cape and *wage* in Milne Bay. They may be 50 feet long; the three planks are lashed on with knee-pieces, which were absent from the canoes seen by him in Milne Bay, where the planks were simply lashed on without knees.

The following is a generalized description, based on several models and on other sources, of what appears to be the typical *waga,* with a central standing mast stepped in a shoe-spar. No exact provenance is recorded for the models. Seligman (1910, p. 536) says: "From Panamoti [in the Egum Islands] are also imported [to Tubetube] the model *waga* used as toys and which are faithful reproductions in miniature of the *waga* built by the northern Massim." But this kind of vessel is also widely used by the southern Massim.

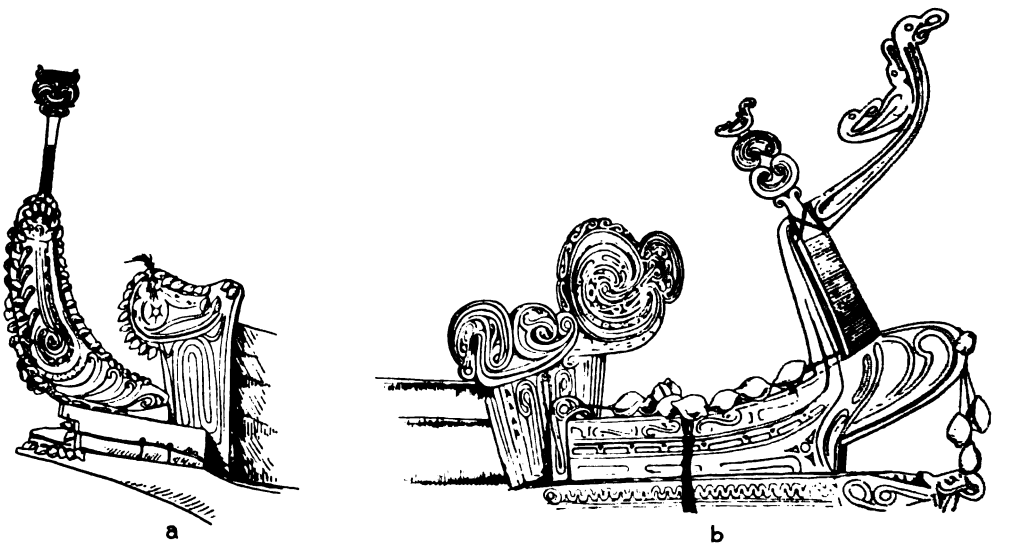


FIGURE 146.—Massim canoe carvings: *a,* typical breakwater, end-erection (type 1), and finial of a Massim *waga* (after photographs); *b,* breakwater, end-erection (type 2), and a peculiar form of finial, Utian (from a photograph by H. O. Forbes, 1886).

Th bottom of the dugout is curved along its length and slopes up to each solid elongated end, one of which may be almost horizontal while the other slants upward. The hollowed-out portion splays out in the center, but the solid ends are laterally compressed and are carved and painted; usually there is a bird's head at the end of the dugout. The models ordinarily show but a single strake, though there should be two or three. A very noticeable feature of these *waga* is the rich and elaborate painted and often perforated carving of the breakwaters and end-erections (fig. 146, *a*). The breakwaters which close up the ends of the strakes are higher than the strakes and are usually lobed, the carving is asymmetrical. Between the breakwater and the end of the dugout is lashed a vertical board, the end-erection, which usually springs

from an elongated, plain base, though it may be fixed in a groove on the upper surface of the end of the dugout; occasionally it is low, but usually has the form of a richly decorated elongated slab that slopes upward; the top is often prolonged into a long flat spur, to which is lashed a carved finial, termed *riri* or *lili* by the Suau and *munkuris* in Murua (figs. 146, *a;* 147, *b*) which will be referred to later.

The strakes, which are clinker-built, are supported within the hull by numerous pairs of L-shaped knees (fig. 147, *a*), which are usually of the same number as the booms. The horizontal limb of a knee rests on the edges of the dugout, and in the angle there is a small hole for lashing the knee to the dugout; the horizontal limbs of a pair are bound together. Through the vertical limb is a large hole for one of the two lateral longitudinal poles and near the end a small hole, or a notch on its free edge, for lashing it to the topstrake. The lateral longitudinal poles extend along the whole length of the hold; the booms, which pass through one strake and abut against the off strake, rest upon and are lashed to these poles. A thin pole may be lashed on the edge of the topstrake.

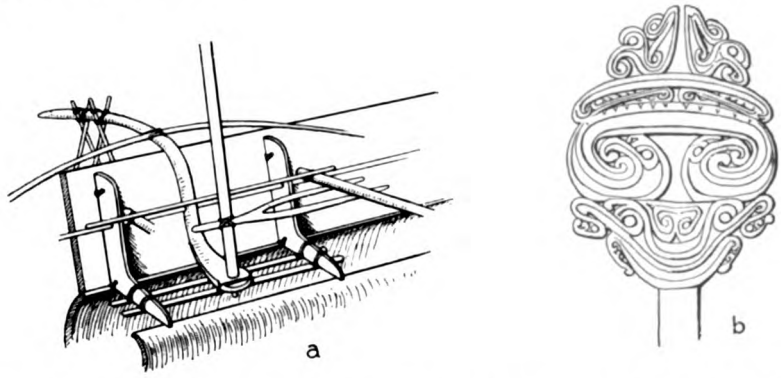


FIGURE 147.—Massim canoe details: *a*, diagram of the stepping of a mast in a shoe-spar; one side of the hull and one knee of each pair omitted (from models); *b*, finial, Daui, height 23 inches, breadth 9 inches (Cambridge Museum, collected by Armstrong).

The number of the booms varies; they are connected with the thick float, which is about as long as the hull, by means of two pairs of divergent undercrossed sticks. The platform consists of longitudinal poles lashed over all the booms and is supported by transverse poles which lie midway between the booms. There are usually two poles or stringers running between the tops of the two pairs of connectives and one or two poles outside the outer connectives. The ends of all these poles are kept in position by being lashed to a transverse pole that lies above them; these two poles may pass through the strake on that side. Certain poles of the platform commonly have a raised end carved to represent a bird.

Beneath and lashed to the horizontal limbs of the two pairs of central knees in a model canoe are two short central longitudinal poles which support the expanded perforated end of the shoe-spar; its notched end is lashed to the pole on the off side (fig. 147, *a*). The spar has a sigmoid flexure; the ascending portion may have a notch on its outward side to fit over the lateral longitudinal pole and it may fit into a notch in the gunwale, shortly above which it is lashed to the center of a bowed pole which rises slightly above the gunwale; the ends of this pole are lashed within the hull to the outer booms close to the strake on the outrigger side. The bowed pole is absent in some canoes. The shoe-spar curves or slants over the platform where it is typically supported by and lashed to two very long divergent undercrossed sticks which are inserted into the center of the float; these sticks cross over the central transverse pole of the platform and thus they are between the two central booms; the shoe-spar is connected by a long lashing to the end of this transverse pole and its free end is usually carved to represent a bird. To steady the ascending part of the shoe-spar there is within the hull a short longitudinal pole or a narrow board lashed over the two central booms, close to the outrigger strake (fig. 147, *a*). It thus serves to press the shoe-spar against the strake; or there may be, apparently for the same purpose, an oblique pole passing from one side to the other and lashed to the four central booms. In one model four short transverse poles cross the two central longitudinal poles and their ends rest on the edges of the dugout; on these and over the longer longitudinal poles are lashed two short longitudinal poles on which the shoe rests and to which it is lashed.

The mast is stepped in the socket or hole in the shoe. Just above this, in order to steady the mast, is a horizontal Y-shaped stick, the stem of which is lashed to one side of the mast and the forks pass under a central boom or they may embrace the stem of the shoe-spar; a vertical wedge passes down between the short longitudinal pole and the strake and between the forks to make all secure—perhaps this is the more ordinary arrangement. In a model in the Port Moresby Museum the stem of the Y stick is lashed to the mast well above the strakes and the fork slopes downward, it embraces the shoe-spar and its ends rest on the platform central to the two pairs of long, undercrossed sticks; the mast is tied to the shoe-spar. The mast may also be lashed to the spot where the shoe-spar is tied to the bowed pole. A short stick may be passed through the top of the mast, in which case the fore and aft stays are lashed to the mast below it. Just below this lashing is inserted an elegant carved prong with a hole at its base for the halyard (or the halyard is rove through a block), the end of the prong, which is carved to represent a bird, is tied by a long string to the mast a short distance lower down.

The long straight sides of the sail are fastened to spars; the halyard is tied to the yard at about a third of its length, and a vang is attached to the other end. Two widely separate ropes which serve as sheets are tied to the boom. A cord may also be fastened to the center of the convex ends of the sail. There seems to be some variation in the number and positions of the sail ropes. The sail is made of longitudinal strips of pandanus (?) leaf sewn together and cords may pass from spar to spar to keep the strips secure.

TUBETUBE

Tubetube of the Engineer group is roughly halfway between the mainland and the Louisiades. It supports one of the chief trading populations of the eastern archipelagoes. Seligman and Strong (1906, p. 238), partly repeated in Seligman (1910, pp. 527, 536), refer to numerous *waga* which they saw at Tubetube as follows:

"Their length over all is often quite 50 feet, and their sides are built up with three or four broad hewn planks to a moulded depth of 4 or 5 feet, yet without a nail [or wooden peg] being used anywhere. . . Nevertheless, the hull is strong enough to bear, not only the strains of heavy loads and high seas, but the even more trying stresses of continual beaching and launching. It is sufficiently rigid to hold the caulking in the seams, yet with a pliancy lent by its lashed fastenings which allow it to give when a rigid nailed fabric, unless enormously stout and heavy, would be very apt to tear itself apart and break up. The canvas of the waga consists of a single oval sail made of strips of pandanus leaf sewn together, while the ropes made . . . at Tube Tube, of hibiscus bast, form excellent stays and running rigging. . . Tube Tube seamen aimed as far as possible to make a fair wind of it when they put out to sea. . . They could, however, work the waga to windward when their work lay that way, and although this was but slow traveling. . . Their crew always aimed to make a harbour every evening. . . Their trade route to Murua, where . . . many [if not all] of the waga were built, was, as they made it, about 120 to 135 miles. They would usually go during the monsoon and come back on the trade [wind]. . . Exports to Murua were varied, but included pots, and imports from there included stone implements and shell money (*sapisapi*). A considerable amount of food was brought to Tube Tube from Milne Bay, a voyage which took two and a half to three days. They also made frequent voyages to East cape, South cape, and to Dobu, the latter being the island from which the Tube Tube people originally came." Further details are given on the method of traveling and also an illustration of a *waga*.

Seligman (1910, p. 35) states that the *waga* with their decorations are imported from Murua and Tokunu, but this is doubtful for Tokunu. (See Seligman and Strong, 1906, p. 241.) The Tubetube do not know the meaning of the carvings.

The photograph of a decorated *waga* from which Seligman and Strong (1906, p. 237) took their illustration shows the ordinary construction. There is a long curved shoe-spar over the platform, its outboard end is curved upward and ornamented with *Ovulum* shells. The shoe-spar is supported by the usual two pairs of long undercrossed sticks and over these is built a small staging on which sticks, presumably for firewood, are laid, and plaited mats are bound over all. This may

be similar to the small stage seen by Macgillivray (1852) on a craft visiting the Brumer Islands.

The smallest canoe made at Tubetube is a dugout with solid pointed ends. The three booms, one at each end and one central, are tied to the edges of the dugout and also on the off side to an external longitudinal pole. There is a stringer outside the typical attachments; the float is nearly as long as the hull.

According to Seligman (1910, p. 526; see also pp. 528, 535) the inhabitants of Tubetube are "recognized as traders and middlemen over a very considerable area extending westwards beyond Basilaki (Moresby Island) to Rogea and eastward to Tokunu (the Alcesters) and Murua."

Macgregor (1890, p. 25) says: "The Tubutubu people are great traders. I saw there four fine seagoing canoes of from 45 feet to 50 feet in length, and of about 6 feet beam, which they had purchased from the natives of Murua (Woodlarks)."

Macgregor (1901, p. 41) says that at Bentley, a small island south of the Engineer group, "They have large, highly ornamented sea-going canoes; there were canoes there also from Wari and Brooker Island."

WARI

Wari (Teste Island) is one of the aboriginal commercial centers of this part of the world. Finsch (1888-a, p. 282; 1888-b, pl. 6, figs. 4, 5) says that canoes are imported from Murua in exchange for the locally made [coiled] pottery, and are completed in Wari with the addition of carvings. Spirited patterns are deeply cut and red and black pigment smeared on by means of a curious implement (*keginiss*) which consists of a piece of the shell of *Pinna nigra* inserted into a ball of gum. This tool is also used in calking. Finsch shows an outrigger attachment consisting of two pairs of undercrossed sticks and a short thick stick lashed below the two crossings.

According to Powell (1883, p. 10) the mast of the large sailing canoe "is formed with a tripod, two legs resting on the outrigger, and one on the bottom of the canoe; the ropes are made out of the bark of a tree twisted tightly together." The length of the largest canoe he saw was about 30 feet. He continues: "These islanders have, besides, smaller canoes, cut from the trunk of a single tree with outriggers on one side only, these are white-washed and ornamented with forms like eyes. The oval sails are of various sizes which they change according to the strength of the wind." The canoes seen by Powell probably came from the southern Louisiades.

Le Hunte (1900, p. 28) describes the Wari canoes as "particularly fine seagoing ones," with decoration which is "really artistic and beautiful. They are made at Utian, or Brooker Island, and sold for twelve tomahawks. The Teste Island natives are very good sailors."

Lindt (1886, Album 5, pls. 107, 109) gives two photographs of "Teste Island" sailing canoes, one of which was redrawn in Chalmers (1887, p. 202) as "A China Straits canoe":

> The strakes are not high. With difficulty it can be made out that the bow alone is provided with the type of end-erection which is characteristic of Utian (fig. 146, *b*) and is referred to by me as type 2 in the summary at the end of this section (p. 276). The fore breakwater is not visible, but the aft breakwater is plain and not higher than the rather low strakes. The float is about as long as the hollowed-out part of the hull. There are eight booms with two pairs of slightly divergent undercrossed sticks; often one stick of a pair is more or less vertical and the other slanting (this may occur elsewhere in the region). Each end of the float is con-

nected with the outer boom close to the hull by a thick rope, which, at all events, is connected at one end with one of the connectives by a lashing. The longitudinal poles forming the platform do not form a close decking; there appears to be an outer longitudinal rail at the ends of which is a large carved wooden bird. There is another bird at the end of a pole on the platform. At each end of the platform is a vertical stick, on the top of which is what appears to be a coconut in its husk (probably a surrogate for a *Nautilus* shell). The platform is ornamented with a few *Ovulum* shells, often in pairs, as is the extreme end of the hull, below which is a fringe. Fibers float from the upper ends of the yard to the booms. The lower end of the raked mast is steadied by what appears to be a thick strong lashing of rattan which apparently is made fast to a boom. There is the usual prong at the masthead which is carved into a bird; the halyard is rove in the angle; there are fore and aft stays; and there appear to be two ropes attached both to the yard and the boom. These canoes doubtless were made in the neighborhood of the Calvados chain.

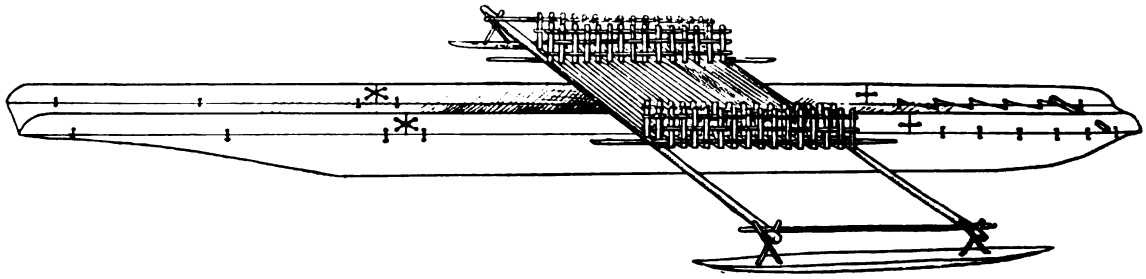


FIGURE 148.—Model of a double outrigger canoe, "Louisiades" (Oxford Museum).

I have a photograph of a canoe at "Teste Island" and of one without a provenance; the second has a central mast with a mast-shore and the usual oval sail. The first has a central mast with either a horizontal pole or a shoe-spar. Both have a type 2 fore end-erection, and the breakwaters are higher than the strakes.

The probability is that all the canoes with this type of fore end-erection (fig. 146, *b*) were made in the neighborhood of the Calvados chain. As the Wari Islanders obviously do not build large sailing canoes, any canoe seen in Wari must have come from elsewhere.

LOUISIADE ARCHIPELAGO DOUBLE-OUTRIGGER CANOE

In the Pitt-Rivers Museum at Oxford is a beautifully made double-outrigger canoe (fig. 148) which was acquired by Pitt-Rivers (Lane-Fox) about 60 years ago. It is labeled as coming from the Louisiade Archipelago, but there is no history connected with it. I see no reason to doubt that the locality referred to by Lane-Fox (1875, p. 430; 1906, p. 222) is correct. The only difficulty is that no double-outrigger canoe is known from Papua or the neighboring islands east of the Fly River. It would be most satisfactory if this record could be confirmed or definitely controverted.

The dugout is long and slender and slopes gently upward at what I take to be the fore end and more abruptly at the aft end. The end view of the bow and stern is semicircular, and their upper surface is flat to where the hold begins. There is a strake on each side composed of a long central plank and a shorter one at each end; near the aft end a stick passes through both strakes and just in front of it is a board thwart which is fixed to the sides of the dugout. The lashing of the strakes to the hull consists of two or three fine strings which pass vertically from a hole in the one to the other, but on the inside of the aft strakes two strings of the lashing also pass obliquely from the strake hole to the succeeding hole in the dugout. The boards are tied together by one horizontal lashing, except for one lashing which is crosswise. The seams are covered over with a white substance.

The two booms are lashed to the top of the strakes abaft of amidships. In the model the platform is 100 mm fore and aft, and it is 260 mm distant from the bow and 148 mm from the stern. The two booms extend 90 to 100 mm on each side of the hull. The short float is flat above and comes gradually to a blunt point at each end, the under side is rounded and slopes gently upward. There is one pair of undercrossed sticks which do not project above the boom. A stringer is lashed to the booms and connectives immediately inside the latter.

The platform consists of transverse laths and on its lateral ends carries a crate of two walls that run fore and aft. In this respect and in the double outrigger with two booms it bears a striking resemblance to the old Torres Straits craft, but in these respects only. We have no knowledge as to the technique of the platform and crates in the original represented by the model. In the model the platform consists of 32 transverse laths which lie between the booms and extend some distance outboard. The laths are bent up toward their ends at a right angle to form the crates. The angle of the outer side of each crate is supported on and tied to a long stringer which is tied to the booms and extends a long distance beyond them, that of each inner side is fastened to a stringer that does not extend beyond the booms. The sides of the crates are formed by alternate laths and thus consist of separated vertical bars, the bent-up ends of each lath help to form the outer side of one crate and the inner side of the other. The vertical bars are strengthened by three horizontal rails which pass alternately on the outer and inner aspects of the bars; the uppermost rail only is lashed to the vertical bars.

LOUISIADE ARCHIPELAGO SINGLE-OUTRIGGER CANOES

Panaieti

The island of Panaieti (Paniet, Panaeti, etc., Deboyne Island), which lies west of Misima, has always been a noted ship-building center. Murray (1912-a, p. 114) says their canoe "is perhaps the best of all." Le Hunte (1901, p. 6) remarks: "These people do a great trade in canoe building." He saw a carpenter carving the prow of one canoe with a wooden mallet and nails of various widths. Kennedy (1894, p. 72) says, "Several large canoes have lately been bought by the Sariba people [China Straits] from the Pannaietti natives." They were very expensive. White (1894, p. 74), speaking of Tagula, says that "at one time nearly all canoes were made at the island of Pannaietti. . . . but now they are making them here themselves . . . Some canoes are capable of carrying about forty men and go long journeys, sometimes as far as Samarai," about 180 miles distant. But Murray (1912-b, p. 19) states that in 1912 canoes were once more being imported into Tagula from Panaieti as the man who made the fine canoes in Tagula had died. Murray (1912-a, p. 144) says that long terms of credit were allowed by the shipwrights even in the old days.

Armstrong took photographs of typical, fine large sailing canoes at Panaieti. The largest has four strakes; the breakwaters and the tall end-erections are beautifully carved with intricate and pierced designs and are ornamented with *Ovulum* shells; when on shore these carvings are carefully protected from the sun by shelters. The long shoe-spar is supported by two pairs of very long undercrossed sticks inserted into the float, and its end is carved into a bird. There are 12 outrigger attachments of the usual type.

Calvados Chain

Macgillivray (1852, vol. 1, p. 247) says that the canoes of the Calvados chain "were of the common description, with the exception of one of large size, closed at bow and stern, with a high peak at each end, a standing mast, large oval sail, and the platform entirely covered over;" a footnote adds, "this is the canoe figured on p. 206." This drawing is very unsatisfactory, the "high peaks" are probably the local type of end-erections.

Seligman (1910, pl. 67) gives a photograph of a *waga* from Utian (Brooker Island), the most westerly of the Calvados chain. The fore end-erection is evi-

dently very similar to that of an Utian canoe photographed by H. O. Forbes in 1886 (fig. 146, *b*). There is a specimen of the same type in the British Museum collected by the *Woodlark,* doubtless from the Calvados chain. The strakes at the stern in Seligman's photograph tail off, and no aft breakwater or other carvings are to be seen. The central mast is supported by a mast-shore and there is a prong at the masthead for reeving the halyard, as in Macgillivray's illustration.

Many years ago the London Missionary Society lent me a photograph of a remarkable canoe taken some time before at Moturina (Mewstone Island) near Utian (fig. 149). It has the usual deep body of a Panaieti canoe; apparently there are three strakes and a combing, but the whole body is coated over with a light wash. The end shown has apparently an end-keel and curves up to a short peak, as in certain *mon* of the Solomons; this is ornamented with *Ovulum* shells and fringes; between it and the high carved breakwater is a streamer-covered polelike erection. Both ends of the canoe appear to be alike. There is a very thick float which evidently is longer than the hull; the attachments, instead of the usual two pairs of undercrossed sticks, appear to consist of a vertical and an oblique stick connective for each of the two pairs of connectives for every boom. The mast has a mast-shore.

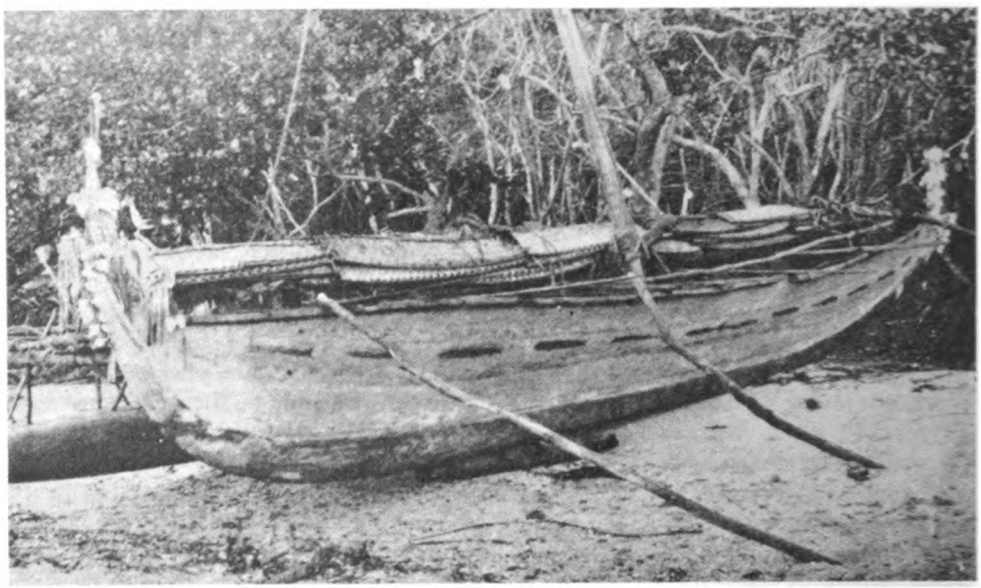


FIGURE 149.—Canoe (*waga*) of unusual type, Moturina, near Utian.

The Utian Islanders had a bad reputation. In 1878 John Court, a bêche-de-mer fisherman, was murdered by the islanders with the help of some Solomon Islanders who formed part of Court's crew. The Solomon Islanders, according to Murray (1912-a, p. 317), remained on the island. It is tempting to suggest that the *mon*-like character of the hull of this canoe was introduced by these Solomon Islanders, but in 1849 Macgillivray saw at the Brumer Islands a visiting canoe which has already been described. According to his frontispiece it had an upturned end forming a low peak in front of the bow-erection, which also was ornamented with *Ovulum* shells and a fringe; it was probably on a trading voyage from the Calvados chain. The upturned ends of the Moturina canoe may be regarded as a local character; other details are normal to the district.

Coral Haven

Macgillivray (1852, vol. 1, pp. 202-205; vol. 2, pp. 321, 322) has described the canoes (*waga*) of Coral Haven, between Joannet, Tagula, and Yeina. The usual length is about 25 feet. Such canoes carry seven to ten persons.

The hull is a dugout, "tapering and rising at each end, short and rounded behind, but in front run out into a long beak. A stout plank [*badai*] on each side raises the canoe a foot, forming a gunwale secured by knees, the seam at the junction being payed over with a black pitch-like substance. This gunwale is open at the stern [*waga-pakena*], the ends not being connected, but the bow [*hebagi*] is closed by a raised endboard [*baragai*, breakwater] fancifully carved and painted in front of which a crest-like wooden ornament [bow-erection] fits into a groove running along the beak. This figure head, called *tabúra*, is elaborately cut into various devices, painted red and white, and decorated with white egg-shells and feathers of the cassowary and bird of paradise. The bow and stern also are more or less profusely ornamented with these shells, which besides are strung about other parts of the canoe, usually in pairs. An outrigger extends along nearly the whole length of the left or port side." There are six to eight booms [*maga*] "2 inches in diameter, which rest against one side of the body of the canoe and are secured there, then passing out through the opposite side for about five feet, inclining slightly upwards at the same time, are connected at the ends by lashing [*wari*] to a long stout pole" [stringer]. The float [*sama*] "is a long, narrow log of a soft and very light (probably a cotton tree) rising a little and pointed at each end." Four diagonal sticks (*patuma*), probably two pairs of crossed sticks, connect the booms with the float into which they are sunk. "A strip of the inner portion of the outrigger frame is converted into a platform [*piri-piritele*] by long sticks laid lengthways close to each other—here the sails, masts, poles, spears, and other articles are laid when not in use. The paddles [*patoma*] vary slightly in form but are usually about four feet in length, with a slender handle and a pointed lance-shaped blade. The number of men able to use the paddles is regulated in each canoe by that of the supporting outrigger poles, the end of each of which, in conjunction with one of the knees supporting the gunwale, serves as a seat. One sitter at each end, being clear of the outrigger, is able to use his paddle on either side as requisite in steering, but the others paddle on the right or starboard side only. The man seated at the stern closes with his body the opening between the ends of the raised gunwale and thus keeps out the spray or wash of the sea. Still they require to bail frequently, using for this purpose the large shell of the *Melo Ethiopica*. . . The sails [*badiara*] are from twelve to fifteen feet in length and a yard wide—made of a coarse matting of the leaf of the cocoa-nut tree stretched between two slender poles. The mast [*mamarang*] is stepped with an outer inclination into one of three or four holes in a narrow shifting board in the bottom of the canoe, and is secured near the top to a slender stick [*tuowo*] of similar length made fast to the outside part of the outrigger; a second pole [*tuowo*] is then erected stretching diagonally outwards and secured to the outer one near its centre. Against the framework thus formed the sails are stuck up on end side by side to the number of three or four, occasionally even five, and kept in their places by long sticks [*pokiwi*] placed transversely, their ends as well as those of the mast being sharpened to serve as skewers which in the first instance secure the sails. While under sail either the bow or the stern of the canoe may be foremost, this being regulated by the necessity of having the outrigger on the weather side, unless in a very light wind. From the sail being placed so far forward these canoes do not lay up close to the wind, but when going free considerable speed may be obtained."

Tagula (Sudest)

The only information I have concerning the canoes of Tagula are photographs by Armstrong. They show that the sailing canoe is constructed and decorated in the usual manner (fig. 150). There is a typical breakwater and an end-erection. The rig is normal and the central mast is supported by a mast-shore which springs from the platform and extends a short distance beyond where it is lashed to the mast. There is the characteristic thin vertical pole at each outer angle of the platform which usually has a carved bird at its end. The well-made sail is evidently made of pandanus leaves and is an elongated flattened oval. A photograph of a Tagula canoe visiting Rossel shows high sides formed by three strakes. Only the upper end of the tall breakwater is carved and there is no end-piece. The mast-

shore extends beyond the off side of the hull and to its end the halyard is tied. There is no off-platform in these canoes.

Rossel Island

Rossel Island (Yela) is the most easterly island of the Louisiade Archipelago. For some time it has been known that the islanders speak a non-Melanesian language, and that there are several characteristics of their culture which indicate that they are different from their neighbors. From this it was inferred that there was a large proportion of an old stock, which could in general terms be designated as Papuan, a stratum which elsewhere in the Massim area has been overwhelmed by migrations of Melanesian-speaking peoples. Armstrong (1928, p. 21) writes that four distinct types of canoe are made on Rossel, three of which differ markedly from the canoes of the Massim: the *no* or *pia no; ma no; lia no;* and the *para no* or *ndap*.

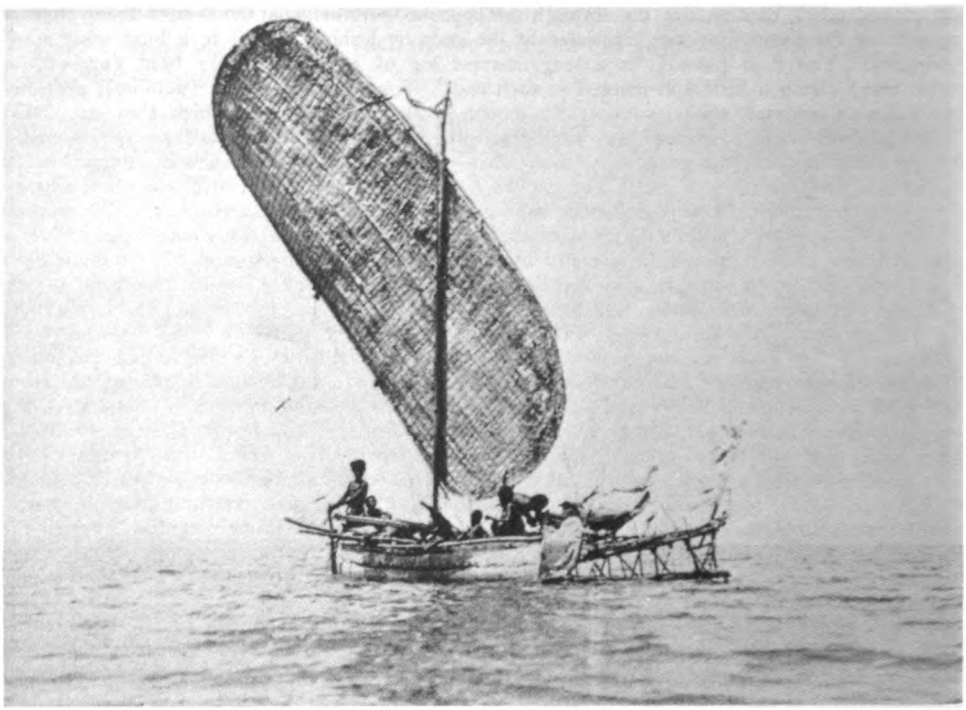


FIGURE 150.—Canoe (*waga*) of Tagula (photograph by W. E. Armstrong).

1. The *no* (generic name for canoe) or *pia no* (female canoe) occurs principally at the west end of the island, its place being taken by the *ma no* at the east end. It is a small unplanked outrigger canoe. Neither it nor the *ma no* is taboo to women. The *no* has a foreign appearance beside the other three, and has probably been introduced from Tagula, where a similar canoe is found, which is not taboo to women. Armstrong (1928, pl. 16, *b*) shows a long thin dugout, raked and sharply pointed at each end and with several poles over the booms apparently to form a platform.

Canoes distinctive of Rossel are characterized by the decking in the dugout for some distance at either end and the addition of washstrakes. A feature of the

lia no and of even the smallest *ma no* is the use of breakwaters, as in the Massim sailing canoes, but they have a very different decorative motive. A feature of both the *ma no* and *para no* is the neat and elaborate binding of thin string around each pair of connectives.

FIGURE 151.—Male canoe (*ma no*), Rossel Island (photograph by W. E. Armstrong; see also 1928, pl. 17, *b*).

2. The *ma no* (male canoe) is a long, narrow vessel; the ends of the dugout are extended to a pronounced, slightly carved spur, called the "nose" (fig. 151). Raised lines on the sides of the bow represent a bird (*mbu*) flying in a high wind.

The dugout is decked over by a plank for a distance of about 8 feet fore and aft in a canoe 28 feet long. There are two narrow washstrakes on the outrigger side and occasionally a broad one on the other side (fig. 152, *c*). The washstrakes extend as far as the decking and are tied to the hull and to the breakwaters; the latter are also tied to the hull and the decking. The washstrakes are tied to each other across the hold at each end and in the middle by thwarts formed of served split cane, which can be used as seats (fig. 152, *c*). The joints are carefully calked. The six booms pass through the lower strake to the opposite edge of the dugout, but not through the strake on that side, they thus slant slightly upward over the float. Armstrong's plan (fig. 152, *a*) shows a stringer over the attachments and another a short distance from it; these are connected by cane ties (like the thwarts) between the booms. There is another stringer nearer to the hull and one close to it. Between the booms are two thin poles, ten in all, which lie over the stringers. The original photograph of figure 151 (Armstrong, 1928, pl. 17, *b*) shows that the attachments of the four central booms consist of two pairs of undercrossed sticks which diverge from each other so that the inner series is at some distance from the ends of the booms and a stringer is lashed to them and the booms. Apparently the connectives of each outer boom consist of two sticks only, the outer of which is nearly vertical, the inner sloping so as to be tied to the second stringer.

Macgregor (1897-b, p. 58) says that the canoe of Rossel is the most skilfully made of any in the Possession:

"They are not made for sailing, and are not of large size, some 20 to 30 feet long, and from 1 to 2 feet broad in the middle part, which occupies about a third of the whole length. A third or a fourth part of the hull at each end gradually narrows towards the extremity. It is straight above, and reduced to a flat surface before the process of digging out is begun. The central part is oblong in shape and is closed in, sides and ends, by boards a foot or more in height, sewn

and well caulked with lime and different kinds of gum. The end parts are dug out through a slit, about 2 or 3 inches broad on the upper side. When the hull is hollowed out to the end, a board is carefully fitted along the whole length of the slit, and is caulked watertight. It thus . . . cannot be sunk or filled so long as water does not get over the top of the central citadel. They are provided with an outrigger, and are pushed or paddled according to the depth of the water."

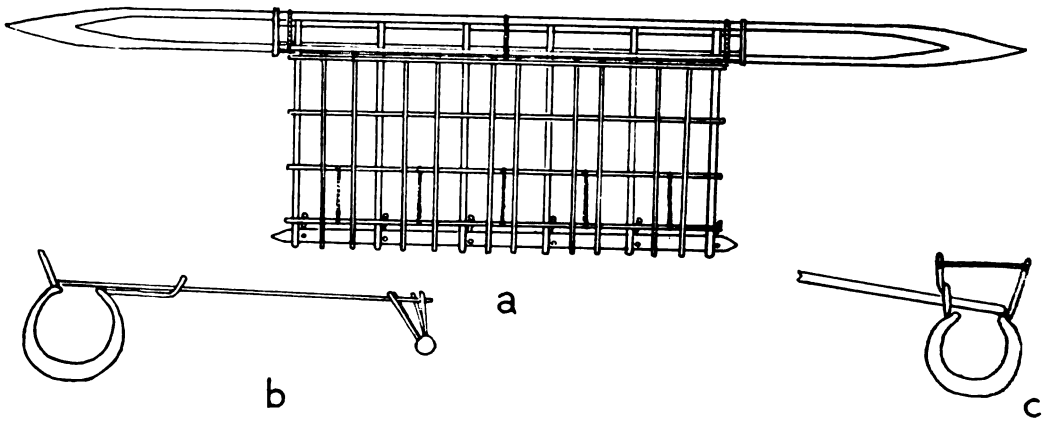


FIGURE 152.—Details of Rossel Island canoes: *a*, plan of a *ma no; b*, section through hull and outrigger of a *para no* showing the unusual form of washstrake; *c*, section of a *ma no* showing served cane thwart (after Armstrong, 1928, pp. 23, 29).

According to Bell (1909, p. 107) the average canoe is 21 feet long and the fore and aft decking extends 4 feet. The strakes are 9 inches high and the end-boards 4 inches higher. The paddles are long and narrow. Some of the natives squat down on their heels on the decked part and paddle, and others sit in the canoe—the gunwales reach almost to their armpits; they paddle in jerks and can lift the canoe along at a good pace.

3. The sailing canoe (*lia no*) is essentially a larger edition of the *ma no*. Armstrong's photographs and drawings (1928, pp. 25-27, pl. 18) indicate that the two vary somewhat, though doubtless they have the same general structure:

The fore and aft ends of the dugout are decked for a considerable distance. There are at least two clinker-built washstrakes (*kum*), on each side, and on the topstrake of the off side there is a gunwale pole. The strakes are strengthened by served cane ties which pass from one side to the other. The strakes are decorated simply on their outer aspects and the breakwaters (*dong*) are carved somewhat in the Massim style but inferior to it.

The eight booms (*jen*) are attached as in *ma no* and each is connected with the short float (*da*) by two pairs of undercrossed sticks (*yeme*) (fig. 153). There are stringers over the attachments and across the booms at short intervals. A close-lying platform (*dade*) of sticks covers the proximal two thirds of the outrigger apparatus; resting on this, about halfway, and over a specially thick stringer to which it is lashed (fig. 154, *a*), is a slanting platform (*iabe*). This platform also rests on the inner upper strake and on the gunwale pole on the opposite strake, beyond which it extends for some distance; it is also supported by the tops of four pairs of L-shaped knees. The short horizontal limbs of the knees are lashed to and over two central longitudinal poles which are lashed within the cavity of the canoe to the upper surface of the ends of the four central booms; the long limbs of the knees support outer washstrakes (fig. 154, *b*). Armstrong points out that the *iabe* by acting as a balance enables the float to be heavier, or the booms to be longer, than would otherwise be possible. In the absence of wind the crew or passengers sit as far as possible from the outrigger, whereas they move toward the float as it emerges from the water when sailing with a strong wind.

The step or shoe-spar (*doa*) for the mast (*piuwa*) consists of a stout massive pole which has an S-bend at its proximal end; the short horizontal terminal part of the bend is broader than

the remainder and is perforated for the insertion of the spikelike foot of the mast; it is also lashed onto the central poles (fig. 154, *c*). The upper bend of the *doa* passes through the *iabe* and over the platforms and its end is connected indirectly to the center of the float by two pairs of undercrossed sticks which are longer and stouter than those which attach the float to the booms.

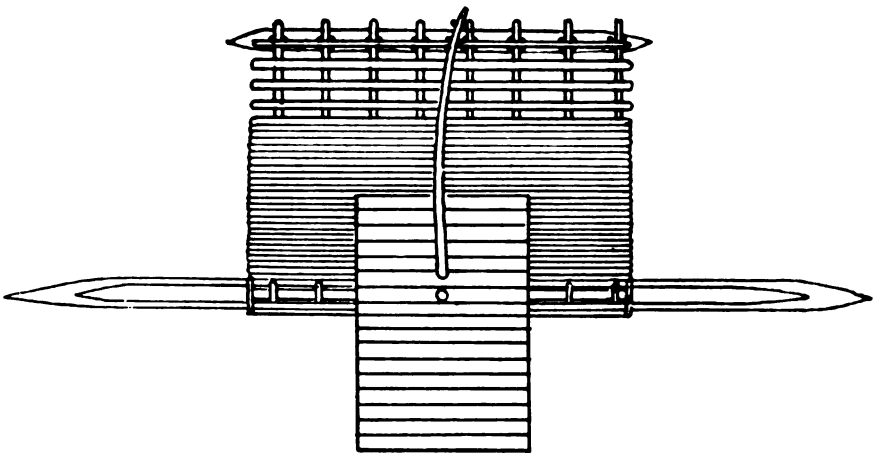


FIGURE 153.—Sailing canoe (*lia no*), Rossel Island, plan showing platforms and shoe-spar (after Armstrong, 1928, p. 25).

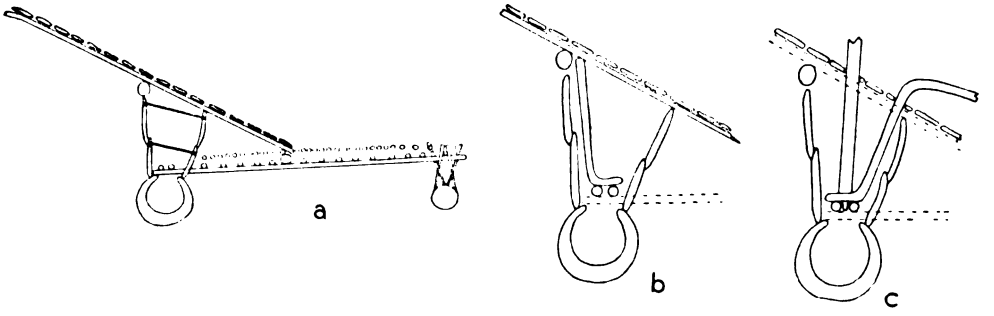


FIGURE 154.—Sections of a sailing canoe (*lia no*), Rossel Island: *a*, across platforms and outrigger; *b*, showing one pair of knees; *c*, showing shoe-spar and mast (after Armstrong, 1928, pp. 25, 26).

The flattened oval mat sail (*lia*) and the rigging are of the usual Massim type, there are two stays. A halyard is attached to about the center of the yard. At each end of the yard is a vang, and sheets are attached at the ends and at the center of the boom.

A steering paddle (*pyi*) about 5 feet long, and at its widest 1 foot across, is kept at each end. An ordinary paddle is called a *kebe*.

The carving at each end of the dugout (*nom*) is the same as that of the *ma no*. *Ovulum* shells are hung at various places; hollow nuts (*yuwangun*) are hung along each side of the *dade* as a protection against storms, and there are other charms. Much ritual is used during a voyage and in the preparation of these and other canoes. The native words given apply to all canoes.

Armstrong saw only two sailing canoes at the west end of Rossel and none at the east end. At the west end he saw a canoe of the Tagula or Panaieti type, which had been made in Rossel under the supervision of a visitor from Tagula.

Armstrong (1928, pl. 18) gives a photograph of a *lia no* showing an *iabe* platform. Instead of a shoe-spar there is a horizontal transverse pole to steady the mast. The hull presents a marked contrast to the Tagula craft. Armstrong (1928, p. 28) writes:

> "According to legend, the sailing canoe introduced by the god Mbasi from Sudest was originally of this Massim type (Panaieti), while the sailing canoes of the Massim, or some of the Massim, were of Rossel type. But one day a Rossel man, Dua, visiting Sudest in his sailing canoe, met a Sudest man, Wulawula, in a sailing canoe of a different kind. Each was charmed with the other's canoe, and they decided to exchange. This same type of legend, in which there is an exchange of canoes, occurs amongst the Massim in another connection."

Mbasi, the snake god and father of the first two human beings, brought from Sudest in his *lia no* the sun and the moon, the pig, the dog, and the taro (Armstrong, 1928, p. 128). Armstrong (1928, p. 127, footnote) adds, "There are many features of Rossel culture that suggest an influence from the Solomons, and even from Polynesia."

A canoe somewhat similar to a *lia no* was seen in 1849 by Macgillivray (1852, vol. 1, p. 205) in Coral Haven, between Yeina, Tagula, and Joannet Islands. It "came from the eastward—probably from Piron Island", Yeina; or it might have come from Rossel as it "resembled some of those which we had seen while passing along the northern side of Rossel Island". The hull tapers to a point and rises slightly at the ends, which "are alike and covered over by a close-fitting piece of wood, each end being thus converted into a hollow cone. The sides are raised by a plank two feet high and end boards forming a kind of long box, with the seams pitched over."

The single outrigger, as seen in Macgillivray's figure (1852, vol. 1, p. 205), has nine booms, the proximal half of which support a platform. The longitudinal poles of the platform are supported on transverse poles over every alternate boom, these poles are evidently lashed to a strong stringer and the ends of the transverse poles are stiffened by a longitudinal pole. Another stringer passes over the booms a short distance from the platform. Each boom is evidently attached to the float by two pairs of undercrossed sticks. On the other side of the hull, continues Macgillivray:

> ". . . is a small stage, level with the gunwale, six feet long, planked over, and projecting four feet or thereabouts. The mast is a standing one stepped into a board in the bottom—it is lashed to a stout transverse pole, and is further supported by two fore and aft stays. The halliards reeve through a hole in a projecting arm a foot long at the masthead. [The sail] measures about fifteen feet in width by eight feet in depth and is made of rather fine matting stretched between two yards and rounded at the sides [it is an elongated oval with straight sides and rounded ends]. The sail when not in use is rolled up and laid along the platform—when hoisted it stretches obliquely upwards across the mast, confined by the stays, with the lower and foremost corner resting on the stage and the tack secured to the foot of the mast. With both ends alike, the mast central, and the sail large and manageable, a canoe of this description is well adapted for working to windward. Tacking is simply and expeditiously performed by letting go the tack, hauling upon the sheet, and converting one into the other. The large steering paddles are eight or nine feet long, with an oblong rounded blade of half that length."

A small model of a canoe of this type in the British Museum (fig. 155) was collected from the "Louisiade Archipelago" by the *Rattlesnake*; it has been sketched not quite correctly by Edge-Partington (1890, pl. 320, no. 2) and not very well illustrated by Macgillivray. The dugout is similar to that described by Macgillivray, but in the model the strakes and breakwaters have been cut out of a single piece of wood. A pattern running along the sides seems to indicate that there were two strakes on each side; the following description is based on this interpretation:

The nine booms are inserted into the dugout itself. The float is longer than the strakes and is flat above with slightly raked pointed ends. Each attachment consists of two pairs of divergent undercrossed sticks. A stringer is lashed over the booms at about half their length; to this are lashed five transverse poles, one over every alternate boom, the other ends of which are fastened to (and should perhaps be inserted into) the lower strake; across these are tied the longitudinal poles that form the platform. The platform thus extends right across the booms and slopes down slightly from the hull to the booms. There is another stringer on the booms beyond the platform. On the off side is a similarly slanting platform of three longitudinal boards supported by six poles, the space between the third and fourth is wider than that between the others. Outside the boards a longitudinal spar is lashed to the poles, the boards are lashed at their ends to the outer poles. The six poles pass through both topstrakes and carry in the cavity of the hull a board of the same length as the others and as wide as the opening; on the off side in the middle of its length the board is cut through to form a truncated triangular opening into the hold. Below this is seen the forked end of a pole which passes through the topstrake and extends over the platform and the central boom to be attached to the inner pair of its connectives.

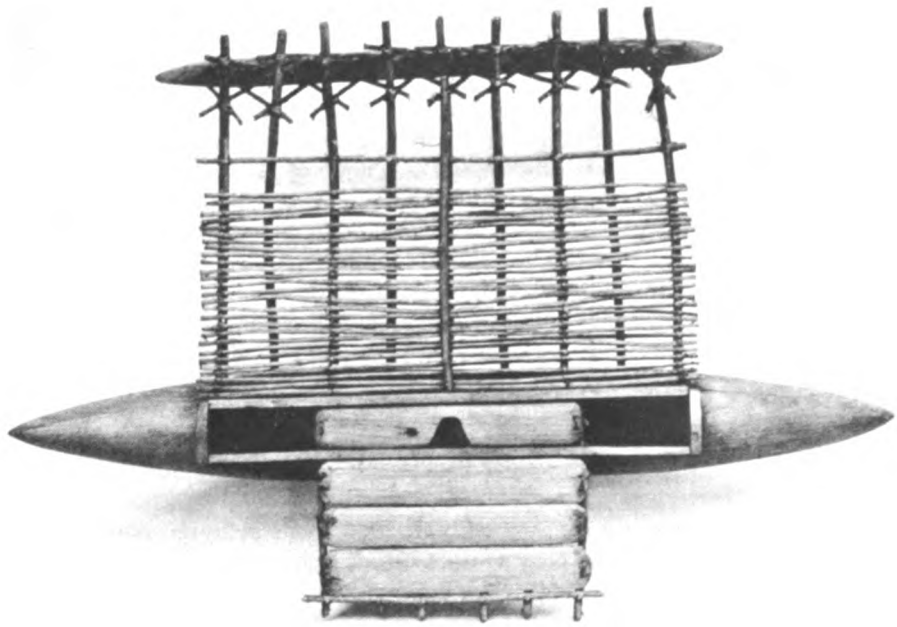


FIGURE 155.—Model of a canoe with horizontal transverse pole to support the mast, "Louisiade Archipelago", probably collected at Coral Haven (British Museum, photograph by courtesy of Capt. T. A. Joyce).

A photograph taken by Armstrong (1928, pl. 18, *a*) at Rossel shows a *lia no* with a horizontal transverse pole apparently with a forked end where it is fastened to the mast; it passes over the strake and extends across the platform, where it seems to be supported by two pairs of undercrossed sticks. This pole is evidently the "stout transverse pole" of Macgillivray. It is not a typical shoe-spar, as Macgillivray distinctly says the mast is "stepped into a board in the bottom", though it is lashed to the transverse pole; neither is it an ordinary mast-shore.

4. The *para no* or *ndap* canoe has several peculiar features (Armstrong, 1928, figs. p. 29). It is used only for certain purposes and is, therefore, somewhat rare and not often seen in the water, which accounts for its not having been mentioned

previously. Although the hull is decked in for a short distance fore and aft and is fitted with short washstrakes, it is not provided with breakwaters. The washstrake on the outrigger side consists of a broad horizontal plank, the free end of which bends upward through an angle of almost 90 degrees (fig. 152, *b*); this arrangement provides a wide seat for the paddlers. The canoe is exceedingly light for its length, which is considerable, and the float is long and slender, the ends being slightly turned up. In one photograph each attachment is shown to consist of one vertical and inwardly slanting stick, as in the outer booms of a *ma no* (fig. 151). It is built essentially for speed and beauty and would be of little use in rough water.

Except for the nose, at either end, similar to that of the *ma no* or of the *lia no*, the decoration is quite different from that of the ordinary canoes and consists principally of a series of oval marks, red in the center and black at the edge. These almost certainly represent *ndap* money or the shell from which it used to be made. Cowries are placed along the upper edges of the decked ends, and large plumes of cassowary feathers just behind the noses, as shown by Armstrong (1928, pl. 19).

The *para no* has no parallel among the Massim; some of its uses are mysterious, but it functions as a symbol of high rank. "Its alternative name of '*ndap* canoe' depends on the fact that it is used on expeditions for the collecting of money required in connection with important feasts. . . Races between chiefs are also held with these canoes on certain occasions." They are also connected with songs and dances of a particular type. "A certain sacredness seems to attach to these canoes, and women are forbidden even to look upon them," according to Armstrong (1928, p. 30).

Armstrong (1928, pp. 21, 196) quotes from V. de Rochas who visited Rossel in 1858 and says some of the canoes are coupled together and the smaller one plays the part of outrigger float. His brief description of the other canoes will apply to any of the types, but he alone refers to double canoes. As no other observer has recorded any such craft from the Massim area, De Rochas' information can not be accepted as definite.

EGUM

A beautiful prow carving adorned with *Ovulum* shells at Egum Atoll is figured in the Annual Report, British New Guinea (1900-1901, 1902, appendix, pl. 30), but no information is given respecting it.

ALCESTER ISLANDS

Seligman and Strong (1906, p. 241) state that, contrary to previous accounts, *waga* are not and were not built at Tokunu, one of the Alcester Islands.

A photograph of a single-outrigger canoe at Tokunu lent to me by Seligman shows a very narrow dugout, not much more than a keel, the solid ends of which slope up into a spur carved into a human face. The lower strake is very broad and the topstrake narrow; at the stern these are cut square and there is a plain flat breakwater not higher than the topstrake; at the bow there appears to be the typical carved boards. There are eight knees through which pass the usual lateral longitudinal poles. The eight booms pass through the upper margin of the lower strake and over the lateral longitudinal poles; they serve as seats within the hull. The free ends of the booms project well beyond the attachments and are flattened from side to side. The rough float is as long as the hull; there are two pairs of slightly divergent, undercrossed sticks; one element of a pair is usually vertical. There is a stringer over the booms outside the attachments, but no platform.

A much smaller canoe is a simple dugout with slightly carved solid ends; the four booms are tied on to its edges.

NADA (LAUGHLAN OR LACHLAN ISLANDS)

Le Hunte (1901, p. 7) states that the natives build canoes in Nada and that a man told him they are sold to the Wari (Teste) Islanders. Murray (1913, p. 13) says:

"There are about 160 natives on these islands. It appears that, in the northwest season they nearly all leave the Lachlans, few remaining behind except old men and children, and undertake trading expeditions to the various islands round about, going as far as the Trobriands on the one side and Sudest on the other, though Murua (or Woodlark Island) seems to be the goal of most of them. In the south-east [season], however, they rarely venture to Murua, as there is real danger of being blown away to sea beyond the hope of return.

"The canoes in which they make these voyages are fine substantial vessels; one which we saw was 40 feet long, and was built up with three lines of planks. Great care is taken of these canoes. They are kept in houses specially built for the purpose, together with their sails and other gear. They are built either on Murua, at Egum, or locally on Nada. Probably most of them are built on Murua, as timber is more plentiful. I was told that none [of the canoes used on Nada] are built at Panaieti, the great centre of canoe construction of the Louisiades.

"Women and children accompany the men on these expeditions, and exchange the mats and dresses that are made on Nada, for sago, yams, sweet potato, and other food. The only food on Nada is coconuts, except a few sweet potatoes; and coconuts and fish are almost the sole articles of diet except what the trading expeditions bring back with them from the other islands. If, therefore, the coconuts cease to bear, the natives are likely to suffer."

Murray (1912-a, p. 130) says:

"The Nada people . . . have carried the art of navigation so far as to be able to steer by the stars at night . . . in the Annual Report for 1900-1 two instances are given where parties of Lachlan Islanders were blown out to sea, one to Cape Nelson and the other to German New Guinea . . . but the fate of those who were blown away from Nada in the old days . . . may well be imagined."

Finsch (1914, p. 476) was evidently mistaken in stating that they have only small insignificant canoes; it is probable that he visited the atoll when the trading fleet was absent, and the canoes he saw there were those used for merely local purposes.

MURUA

Finsch (1888-a, p. 282) was the first to note that the Murua folk trade large beautiful seaworthy sailing canoes to Wari, 150 miles distant, in exchange for pottery.

The carvings attached to the canoes are remarkable works of art which are traded far and wide. It is not yet possible to define the difference between the Murua carvings and those which are made elsewhere, owing to the carelessness of collectors in omitting to record the localities of the specimens obtained and to the absence of notes taken on the spot. The matter is further complicated by inter-insular trade and specific inquiry is necessary to determine whether any given object was really made at the spot where it was obtained. The only evidence as regards the signification of any of the carvings is a paper by Seligman (1909-a), which deals with the carved finial (*munkuris*) which is fastened to the top of the tall end-erection. He explains the designs and states on the authority of Barton that the *munkuris* wards off dangers when voyaging. There is no evidence that the other carvings and the *Ovulum* shells, which are so generally and abundantly added, have a "magical" import. Some men said that fish were carved upon the

sides of the *waga* in order that the canoe might travel swiftly, but others denied this.

Seligman (1910, p. 534) says: "The great built-up canoes called *waga* were built at Murua and numbers of them appear to have been exported to Tubetube whence some at least passed to the islands nearer the mainland. The *waga* built on the Marshall Bennets and the Trobriands may have been traded to the D'Entrecasteaux." He doubts whether this occurred to any considerable extent as he gathered that the D'Entrecasteaux Islanders "used smaller built-up canoes (called *kebwaii* at Tubetube) on their journeys". It is certain that the *waga* built in the Marshall Bennetts and Trobriands do not pass to the south in any quantity. Seligman (1910, pl. 63) gives a photograph of a *waga* from Murua, but there is nothing to show how the mast is stepped.

Armstrong photographed at Murua a small canoe with five booms and two strakes on each side; the end was cut off square but the bow of the dugout was prolonged into a long, slightly ascending spur on which was a high narrow decorated bow end-erection ornamented with *Ovulum* shells and surmounted by a *munkuris*. There were no breakwaters. This canoe resembles somewhat that described for Tokunu.

MARSHALL BENNETT ISLANDS

The only information I have concerning the canoes of this group is a photograph from Seligman of a small plain canoe at Gawa. The solid ends of the dugout are crudely carved to represent a bird's head. The breakwaters are higher than the topstrakes; the plain bow end-erection forms a rising peak whereas the aft one is a triangular board sloping down to the aft end. There are four booms between which are transverse poles to support the sketchy platform of longitudinal poles, the ends of which are secured by a transverse pole above them; the platform extends beyond the outer booms. The float is as long as the hull with typical attachments.

TROBRIAND ISLANDS

Seligman (1910, pp. 526-540) has given a valuable account of the trade carried on between the northern and southern Massim peoples, which is partly based on the notes on the Trobriand trading expeditions by Gilmour (1905, pp. 71, 72). The subject is of great importance for the elucidation of the ethnography of this complex area. Seligman (1910, pp. 528, 529) says:

> "The whole of the southern Massim, including such almost self-supporting communities as Wagawaga [in Milne Bay], relies upon the northern Massim for the manufacture of certain articles of great value and upon the middlemen of islands such as Tubetube for their supply . . . The Trobriands appear to be the chief centres of manufacture of all these ornaments."

The trading, practical and ceremonial, was mainly from the Trobriands to the Amphletts, Fergusson, and the islands adjacent, as far as the north side of Dawson Straits. From the D'Entrecasteaux the trade went to Tubetube and probably to Wari. From Tubetube the main current of trade went to the Alcesters and Murua, but there was also a western trade though there does not appear to have been any trade with Misima or any islands of the Louisiades. Seligman (1910, p. 530) adds:

> "It is however known that Murua *waga* frequently visit the Louisiades and doubtless these bring the products of the northern Massim to this archipelago. The carving and painting on the *waga* built in the Louisiades are so different from that of the Trobriands, Marshall Bennets

and Murua as to be easily recognized. Yet among the many *waga* I saw while in the Massim area I noticed none that had been built in the Louisiades."

Malinowski (1922) has made a detailed and sympathetic study of the Trobriand Islanders and has given a psychological interpretation of the *kula* system or ring. This is the circulation in definite directions of articles of great sentimental value, and is associated at the same time with ordinary trade. The system of the exchange of valuables is traditional, public, and ceremonial and is accompanied by magical rites. The sphere of the northern system of *kula* is from the Trobriands to the Amphletts, and especially to Dobu. The Dobuans are an energetic people who have gained control over a large area, but the Trobriand men have no *kula* relations with other islands of the D'Entrecasteaux group. However, there are ordinary trade relations between the natives of Katataria (a village on the north side of Trobriand lagoon) and Kayleula (an island west of Boyowa), and the Koya of Fergusson and Goodenough (Malinowski, 1922, pp. 231, 500; Gilmour, 1905, p. 71). The southern system includes the Marshall Bennetts, Murua, and Nada. There is also a *kula* cycle from Murua and Nada to Misima and Panaieti, and from Murua to Tubetube, which is a great trading center and has direct trade with Murua and Dobu. Wari and the Moresby group are also implicated.

Malinowski describes the magical and ceremonial practices connected with all the stages in the building of a canoe that is concerned in the *kula*. The natives have a marked emotional attitude toward such canoes. There are four types of canoes. The following descriptions are based on Malinowski's book and further information kindly supplied by him:

1. The *kewo'u* (Malinowski, 1922, fig. 1, p. 111, pl. 36; Silas, 1926, pl. 23) for coastal transport in the lagoon of Boyowa, the largest island of the group, is a simple dugout with neither strakes nor carved boards. Presumably there are only a few booms, perhaps not more than six, each with two pairs of undercrossed connectives (*vatotuwa*); as a rule there is no platform. The canoe is owned by an individual and no magic or myth is attached to it.

2. The *kalipoulo* (Malinowski, 1922, fig. 2, p. 111; pls. 24, 37; Silas, 1926, pl. 26) is essentially a fishing canoe. It is a larger dugout with pointed ends which are usually carved and painted; the hollowed-out portion is flanked with a washstrake (*koumwali*) on each side and by transverse carved and painted breakwaters (*lagim*). A median vertical, carved and painted end-erection (*tabuyo*) [type 3] runs along the top of each end of the dugout. The washstrakes are supported inboard by pairs of knees (*gelu*) of the type usual in this district. The straight booms (*ri'u*) vary in number up to 10 or 12; a boom passes through one washstrake and abuts against the other, resting on the edges of the dugout. When numerous, the booms are rather close together and support a continuous platform. The float (*lamina*) is almost as long as the hull and is distant from the hull about one quarter of the hull length; it is placed to windward. In all canoes the attachment consists of two pairs of undercrossed connectives. There seems to be considerable variety in this type of canoe. Each is owned by a headman of a fishing group who performs the fish magic; minor myths are connected with them.

3. The *masawa* (Malinowski, 1922, fig. 3, p. 111; pls. 21, 23, 40, 41) is the large trading canoe; but *waga* is the general term for all kinds of sailing craft. It is in connection with these that there is a wealth of myth, magic, and ceremonial. In the construction of a *masawa* there is sociological differentiation of functions and a magical regulation of work as there is a distinct relation between magical efficiency and craftsmanship. Each canoe has its own name. A *masawa* is constructed by a group and owned and used communally according to recognized rules forming a definite canoe sociology.

The *masawa* (fig. 156) is constructed in essentially the same manner as the *kalipoulo*, but there are two clinker-built washstrakes on each side. The breakwaters and end-erections are of type 1. The booms pass through the lower strake and abut against the opposite strake; they do not rest upon the edges of the dugout, but upon two longitudinal poles, each of which passes through holes in the vertical limbs of the knees. The booms may be 20 or more in number and are covered by a continuous platform (*pitapatile*); each is connected with the long float in the usual way. All of the parts are suitably lashed.

The mast is stepped forward on the off side and is supported by a mast-shore. The triangular sail is made of strips of dried pandanus leaf; two layers are sewn one on top of the other

to make a solid fabric (Malinowski, 1922, p. 140). The sides are supported by spars which are sometimes spliced. There are two or three ropes or sheets (*veva*) attached to the spar that acts as the boom. A spirited illustration of a *masawa* sailing is given by Silas (1926, pl. 21).

The best centers for building *masawa* are the islands of Vakuta, immediately south of Boyowa, and Kayleula, to the west. The island of Kitava, farther to the east, is the traditional and mythical center; the finest canoes and carvings are made there. It is also used and built in the Amphletts and in the district of Dobu in the D'Entrecasteaux.

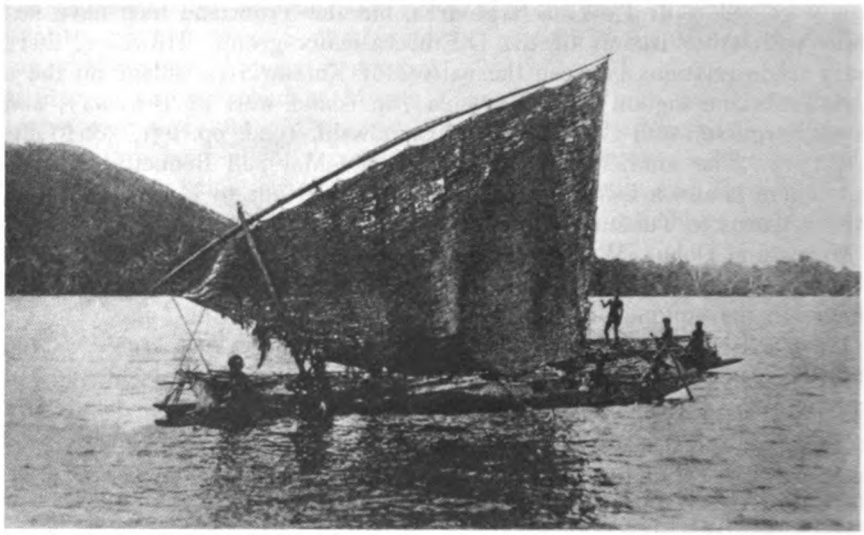


FIGURE 156.—Small sailing trading canoes (*masawa*) with Oceanic lateen sail, Trobriand Islands (photograph by W. E. Armstrong, 1921).

There are definite sailing seasons (Malinowski, 1922, pp. 225-26, 229-30). In sailing the natives take bearings by sight and are helped by the uniformity of the winds; they have no need of even the most elementary knowledge of navigation. Barring accidents, they never have to direct their course by the stars, of which they know certain outstanding constellations. Their knowledge of the stars is localized in the village of Wawela, on the east side of the main island, where it is handed down in the maternal line of the chiefs of the village. There are nautical terms to describe the various operations and rules as to how the various maneuvers should be carried out. They have weather spells, and are subject to specific taboos. There are many tales of lost canoes.

Malinowski (1922, p. 226) describes the method of sailing:

> The wind must always strike the craft on the outrigger side, so the sailing canoe is always tilted with its float raised and the platform slanting toward the body of the canoe. A turn of the wind makes it necessary to be able to change bow and stern at will. The mast, which is tied at the fourth boom (*ri'u*) from the temporary bows of the canoe, is unbound and attached to the fourth boom from the other end, and the sail is then hoisted.
>
> It takes two men to steer, one has a large elongated steering oar (*kuriga*) and he sits at the stern, the other handles a smaller leaf-shaped steering paddle (*viyoya*) with a bigger blade than that of the ordinary paddles. The second steersman sits at the stern end of the platform and does the steering through the sticks of the platform; the steering oars act as lee-boards. Malinowski (p. 227) says: "When the wind drops, the men have to take to the small leaf-shaped paddles, while one, as a rule, wields a pulling oar."

The other working members of the crew include the man at the sheet and the lookout man in the bows who, when necessary, climbs the mast to trim the rigging; he also bails the canoe from time to time. Thus four men are enough to man a canoe, though usually an extra man does the bailing. In order to give speed to a heavy *masawa* canoe when not sailing, at least ten men would have to paddle and pull.

When they arrive at a halting place, the canoes, if necessary, are beached. As a rule, however, the heavily loaded canoes on a *kula* expedition are secured by both mooring and anchoring, depending on the bottom. On muddy bottoms a long stick is thrust into the slime and one end of the canoe lashed to it, from the other end of the canoe a heavy stone, tied with a rope, is thrown down as an anchor. Over a hard rocky bottom the anchor stone alone is used (Malinowski, p. 228).

4. The *nagega* (Malinowski, 1922, pl. 64) is the eastern type of large *waga*. It is larger and more seaworthy than the *masawa* with higher sides and consequently of greater carrying capacity. Malinowski (p. 144) writes: "The larger water board offers more resistance against making leeway, and this allows the canoes to be sailed closer to the wind. Consequently, the Eastern canoes can beat, and these natives are therefore much more independent of the direction of the wind in their sailings. With this is connected the position of the mast, which in this type is stepped in the middle, and it is also permanently fixed." [The photograph shows the shoe-spar stretching well beyond the platform; its end is ornamented with *Ovulum* and other shells.]

The *nagega* is used on a section of the *kula* ring, beginning at Gawa, the most southerly island of the Marshall Bennetts, and ending at Tubetube. It is also used in certain parts of the Massim district which lie outside of the *kula* ring, Tagula (Sudest) and the surrounding islands, for instance; and it is used among the southern Massim of the mainland.

The *nagega* is made only in a few places, the more important being Gawa, a few villages on Murua, Panaieti, and perhaps in one or two places on Misima. From these places the canoes are traded all over the district and they are one of the most important articles of trade. Malinowski (1922, p. 145) writes:

"In olden days, that is, about two or three generations ago, the *nagega* was used exclusively in Iwa [between Kitava and the Marshall Bennetts], Kitava, Kiriwina [the northern part of Boyowa], Vakuta, and Sinaketa [a village on the east coast of the Trobriand lagoon], while the Amphlettans and the natives of Kayleula would usually use the *nagega*, though sometimes they would sail in *masawa* canoes. Dobu was the real home and headquarters of the *masawa*."

Malinowski could not ascertain when the shifting began and was completed. Neither could he tell whether the Trobrianders actually made *nagega* canoes or whether these canoes were imported from the island of Kitava to the east of Boyowa or made by craftsmen imported from Kitava. He writes (1922, p. 145):

"There is no doubt, however, that in olden days, the natives of Kitava and Iwa used themselves to make the *nagega* canoes [as is confirmed by myth]. . . Thus in this district at any rate, and probably in the Trobriands and Amphletts as well, not only the use, but also the manufacture of the bigger canoe has been superseded by that of the smaller one, the *masawa*, now found in all these parts."

Thus the heavier, more seaworthy, and better sailing canoe was driven out some time ago by one which in many respects is inferior, but swifter, and less difficult to build.

The information given by Finsch (1888-a, p. 209; 1914, p. 476) is so imperfect, where it is not absolutely erroneous, that it can be ignored.

Armstrong photographed some small fishing, sailing *masawa* canoes (fig. 156) in which the end-erections are of the type characteristic in this craft (fig. 160, *b*). The short stout mast is stepped within the hull on the off side and leans over the outrigger and is supported by a mast-shore that springs from the platform. The large triangular sail is tied to a yard and a boom, the halyard is tied to the strong yard, about one quarter or less of its length; when sailing the yard is usually inclined at a low angle.

Whitehouse (1922, p. 55) refers to the ceremony (*kauwabusi*) of driving out a spirit (*Tokwai*) from the tree before it is cut down to be made into a canoe and gives details about the construction of a *masawa* canoe:

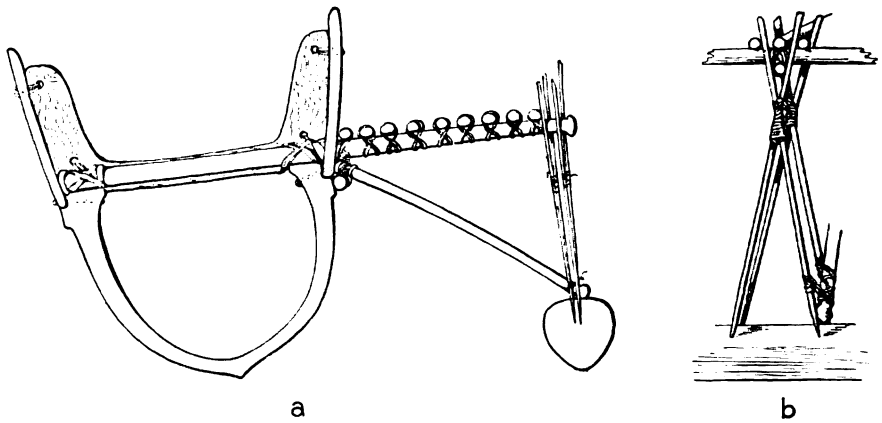


FIGURE 157.—Details of canoe construction, Trobriand Islands: *a*, section showing the rib-piece and the structure of the outrigger, the *kavalau* is seen below the strake, the *doraba* stretches from it to the float; *b*, attachments, the *kaitokweda* is seen above the boom and between each pair of connectives, the transverse poles above it seem to be an additional platform laid over the longitudinal poles of *a* (from Whitehouse, 1922, pp. 57, 59).

After the washstrake (*budaka*) has been shaped to fit the gunwale and the transverse breakwater (*lagima*) it is lashed with a very strong swamp creeper (*waiiugu*) which is used for most of the lashings. The end-erection (*tabuia*) is fitted into a slot along the top of the prow (*nipauwa* or *pusu*). The various parts are neatly fitted and all the cracks are calked with *kaibas*. The prow and the two breakwaters are richly carved, painted, and often decorated with *Ovulum* shells. The numerous short booms (*li-iu*) rest upon both edges of the dugout and pass through one washstrake to abut against the other beside a U-shaped rib-piece (*gelu*) which also rests on the gunwales and supports the strakes. These several structures are lashed firmly together (fig. 157, *a*). A longitudinal pole (*kavalau*) extends from end to end of the outside of the hull on its outrigger side (*kailamila*) just below the strake. The long narrow platform (*pitapatila*), which extends along the length of the canoe over the booms and between the strake and the connectives, is made of longitudinally disposed small round sticks, an inch in diameter, with a space of 2 inches between them. At each end of the platform, a pole (*kaikaiwa* or *matana-waga*) is tied across the ends of the sticks to prevent them from curling up. A stringer (*kaitokweda*), the outside of the *pitapatila*, stretches across the booms and between the outer and inner pairs of connectives; it adds strength to the booms and connectives and with the *kaikaiwa* keeps the platform squarely braced. The float (*lamila*) is a straight piece of buoyant wood with slightly turned-up ends; it is charred to render it impervious to water and to protect it against the seaworm. The attachment (fig. 157, *b*) consists of two pairs of long undercrossed sticks of cane (*vatotuwa*). Toward the end of the float there is in many canoes a strengthening spar (*doraba*) that is tied to the connectives close to the float and slants up to abut against the strake under the platform and over the *kavalau* (fig. 157, *a*). [*Doraba* are shown but not mentioned by Malinowski (1922, pls. 24, 41, 47) and by Brown (1908, pl. p. 480).]

The mast (*valiia*) has a fork at the top for the halyard; it rests on the float and passes up through loops (*wiwaiita*) fastened to one set of connectives, and is probably lashed to the *kaitokweda* outside the platform. It is supported by a forked mast-shore (*kainaiia* or *keiasi*) that abuts against the outrigger strake and slants over the platform. The sail (*laiia*) is made of *moi* leaves. There are three forms of the triangular Oceanic lateen sail: that of medium size (*dodauta-laiia*); that of narrow and elongated shape (*oluwalu-laiia*); and that which is a large patella-shaped sail (*kubukwabu-laiia*), the base of which is hoisted while the apex hangs downward.

Oars are supported by rowlocks (*dabuma*), the loops are of cane (*waiiugu*) or of a swamp creeper (*pilipali*). A roughly shaped oar (*vega*) is often used as a paddle. In large canoes

there are two steersmen, one steers in the hull and the other from the float; the steer-oar is called *kuliga*. A wooden bailer (*iatula*) is employed. The stone anchor is called *lola* or *lona*. The *kakovata* is a rope securing the float to the prow.

Whitehouse (1922) gives the following information: canoe with two strakes on each side, *bwadula;* large fighting canoe, *masauwa,* not built now; canoe with three strakes, *masauwa-kikita;* with four, *masauwa;* with five, *masauviiaka;* with six or seven, *masauviiaka-isiiosi*; with any number over five, *mosonaki.* He refers to a ceremony (*pusogauwa*) before the launching of the canoe to give it strength and swiftness; this is immediately followed by a parade (*tasasoliia*), when the canoe is raced and must be admired. He says it takes three to five months from the felling of the tree for two men to make an average-sized canoe 25 feet long.

Silas (1926, pp. 179-186) gives an interesting account of the making and sailing of canoes, and emphasizes the affection the natives have for their canoes.

AMPHLETT ISLANDS

A photograph shows that the smallest canoes of the Amphlett Islands are dugouts with bluntly pointed solid ends. A gunwale pole is laid over the booms. The outrigger apparatus is typical of the area; at the fore outer corner of the platform is a vertical stick with a crescent at the end. Some canoes carry a coconut-palm leaf sail on the platform; one photograph shows a thwart with a hole at its off end which may be for the stepping of a temporary mast which would be supported by a mast-shore.

Concerning the sailing canoes I can find only Malinowski's statement (1922, p. 145) that there is reason to believe that the natives formerly made *nagega* canoes with a central standing mast, but that this was gradually replaced by the *masawa* canoe with an eccentric shifting mast. He gives photographs (1922, pls. 39, 47) of *masawa* canoes with typical carvings being loaded with pots. These canoes are of the usual type and without a standing mast.

According to Malinowski (1922, p. 282) these islanders are the exclusive manufacturers of pottery within a wide radius including from the Trobriands to Murua on the one hand and to Dobu and as far south as Milne Bay on the other. Seligman (1910, p. 531) says:

> "The strongest and best decorated pots in the Possession are made on the islands of the Amphlett Group whence they are traded in two directions, northwards to the Trobriands and southwards and eastwards to Milne Bay and the neighbouring islands. These handsome pots do not reach Tubetube" [as pots are made in that island]. The sepulchral pottery used on Murua (Seligman, p. 731, pl. 78) comes from the Amphletts.

One interesting feature is that the pots are made by the modeling process. In the modeled technique of the Motu the pot is worked upward from the solid bottom. According to Malinowski's detailed account (1922, pp. 284-86) the Amphletts pot is worked up from the lip, being in an inverted position, and the bottom is filled in last. In the manufacture of the Mailu pottery, the coiling begins at the bottom and is continued upward, but the bottom is actually finished off after the rest of the pot is completed. Schurig (1930) has overlooked Malinowski's account, though she refers (p. 14) to Seligman (1910, p. 531), who does not mention the technique of the Amphletts pottery which she infers was coiled. Jenness and Ballantyne (1920, p. 194) describe the coiled pottery made in Goodenough Island; they are not quoted by Schurig, but she gives a reference to Finsch (1914, p. 272) who fails to mention the technique. It is not yet clear in what craft the makers of these two types of pottery arrived at Papua, but I suspect, despite the coiled pot-

tery of Goodenough Island, that the modelers came in *waga* with the eccentric mast and that the coilers had *waga* with a central mast.

D'ENTRECASTEAUX ISLANDS

Canoes of southeast Goodenough Island have been described by Jenness and Ballantyne (1920, pp. 185-188, pls. pp. 18, 32, 166, 186). Jenness has kindly lent me a large number of photographs, and it is from all these sources that the following account has been compiled. There are three kinds of canoes in this district:

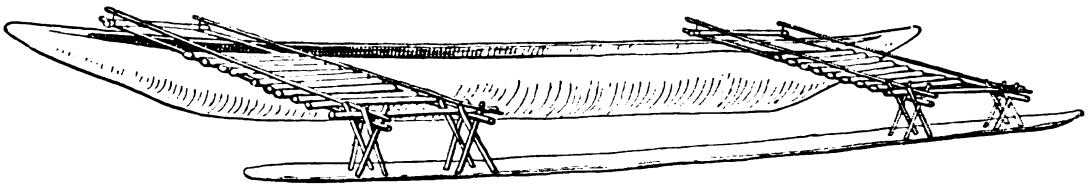


FIGURE 158.—Small canoe (*babanasi*), Mud Bay, Goodenough Island (after photographs by D. Jenness).

1. Small canoes (*babanasi*), that will hold but one or at most two persons, are used mainly for fishing (fig. 158). They are simple dugouts that rake gradually up to a point at each end, both ends being alike; the sides tumble home so as to leave a narrow opening. Fire is never employed in the hollowing-out process. The light float (*gamana*) is about as long as the hull and is pointed at each end. Quite close to stem and stern two booms are lashed fairly close together on the edges of the hull. Each boom (*yogawa*) is attached to the float by means of two pairs of undercrossed sticks (*tutula*). A small platform of sticks is made across each pair of booms as far as the attachments (fig. 158). These two widely separated platforms carry the fish net, traps, baskets of food, etc. In some canoes there is a gunwale pole that passes over the booms.

2. The *aiyebu* are larger canoes of the same type that will hold two to eight persons. Many have long pointed solid ends which may be flattened above and there is often a lateral bead running a short distance from the ends. A gunwale pole may be present. The larger platforms are supported on 3, 4, or 5 short booms; in the long space between these two groups of booms there is usually a central boom attached in the customary manner. One attachment (Jenness and Ballantyne, 1920, pl. p. 32) shows a subsidiary boom fixed beside the proper boom; it slants down to the attachment and its forked end rests against the inner pair of connectives below their crossing. In another photograph there is a simple stick below the boom, which probably is attached close beside the boom and its free end is lashed to the crossings of the connectives. These devices appear to be occasional expedients to strengthen an attachment. The light float is as long as the hull and pointed and raked at each end; it is charred by fire to make it more buoyant. A large volute shell picked up on the beach, or a cup of coconut shell, makes a convenient bailer.

According to Jenness and Ballantyne (1920, p. 186), "If a favourable wind is blowing a mast can be quickly improvised in the front of the canoe, and a long rectangular sail of [inter-] woven coco-nut leaves made fast along one of its edges." It appears from the photograph, which is of a small *waga* (fig. 159), that the midrib of a coconut leaf is split longitudinally and the leaflets plaited with those of a whole leaf; the halves of the midrib form the long borders of the sail. The thin pole that supports the sail is passed through it near the border on the outrigger side in such a way that the lower half of this pole shows on the aft side of the sail and the upper half on the fore side; the pole is stepped well forward on the outrigger. The lower quarter of the other border of the sail is supported by a short pole and, as the end of this is provided with two short stays, it may be considered as the true mast; if this be so, the longer pole is morphologically a boom but actually functions as a mast. Two lines tied to the middle of the long sides of the sail and carried aft serve to adjust the sail to the wind.

3. The built-up canoe (*waga*), sometimes called *keama*, is generally larger than the *aiyebu* and so is the more usual vessel employed in traveling long distances; it carries 4 to 14 persons. There are usually two strakes (*baba*) on each side; these are secured by paired knees (*iyadaga*) lashed at intervals. There is a hole in the angle of each knee through which a rod that extends along the whole length of the hold is passed; on these lateral longitudinal poles small boards are placed to form seats for the paddlers. The seams are calked with the scrapings of the

alufwa vine steeped in water. The strakes are not carved or painted, but the sides of the ends of the hull occasionally have a little carving. The ends of the strakes are closed by breakwaters (*bodawa*), which are slightly higher than the strakes; each upper corner is carved into a volute and in the center of the upper margin one or two human figures, more or less complete, are almost invariably represented; this outer surface is variously carved and painted. These features may also occur in the large *aiyebu*. Two views (Jenness and Ballantyne, 1920, pl. p. 186) are given of a prow. A carved end-erection (*vagavaga*) in front of the breakwater extends along the proximal, solid part of the bow end of the hull, the distal part of which is covered with *Ovulum* shells; the breakwater and the fore part of the strakes are similarly ornamented. *Ovulum* shells are sometimes attached to parts of the outrigger apparatus.

FIGURE 159.—Small *waga* with temporary coconut-leaf sail, Wagifa, Goodenough Island (photograph by D. Jenness).

The numerous short straight booms pass through the lower strakes on their side but not through the opposite strake. The float is about as long as the hull and is often of considerable girth; it is attached to each boom by two pairs of undercrossed sticks. One photograph shows a pair of subsidiary booms that evidently arise in the same way as the ordinary booms, but they bend downward to clamp the connectives at one end of the float; the photograph does not show whether there is a similar pair at the other end. Sometimes there is a lashing from the outer boom to the end of the float. The booms are covered by a large platform (*lawenoya*).

The *waga* are frequently propelled by paddling, in which case the mast is usually unshipped. Small *waga* often have a temporary sail of coconut leaf (fig. 159). Large *waga* have a short stout mast with a prong near its end and supported by fore and aft stays. In a photograph (Jenness and Ballantyne, 1920, pl. p. 18), it looks as if the foot of the mast is bifid and resting on the outrigger gunwale. The elongated, triangular Oceanic lateen sail is made of leaves of the sago palm sewn together. It is stretched between two spars; the halyard is fastened at about one third of the length of the yard. Jenness and Ballantyne (1920, pp. 186-7) write:

"In use . . . the yard rests about half-way along its length in the forked top of a short mast that is set up in the bow, and the foot is dragged downwards and inwards and fastened by a brace to the rods of the outrigger. [In Tonga the yard was supported in the fork at the head of the mast in a primitive form of lateen sail. In canoes elsewhere the fork or the prong serves to reeve the halyard.] The sheet is attached to the boom at one end, while the other is held in the hand or loosely tied to one of the cross-rods. If the wind is very strong, sail can be 'shortened' by slacking the brace and hauling on the sheet till the boom rests on the platform. . . A heavy oar in the stern acts as rudder when running under sail. Sometimes, if the wind is fresher than usual, two oars are used, one from the canoe itself, the other by a man who stands with one foot resting on the end of the outrigger [float]. There must always be one man in the bow to slacken or haul in the brace whenever it is necessary to alter the set of the sail. If tacking must be resorted to, the mast has first to be unstepped and set up again at the other end of the canoe, since the outrigger must always be on the windward side. . . A *waga* under full sail with a good breeze on the quarter can travel about six knots an hour, but if the wind is unfavorable the natives must wait in shore until it changes." [They cannot sail close to the wind.]

The natives use a large wooden bailer resembling a scoop, but with its peg handle inside. The blade of the paddle is lanceolate and the end of its handle is often carved; but, whenever possible, the natives prefer to pole their canoes. The larger *aiyebu* and the *waga* are kept under shelter when they are not in use, but no such care is taken of the smaller run-about *aiyebu* or *babanasi*. Small canoes are usually nameless but every large canoe has a name.

A photograph by Armstrong taken at Fergusson Island in 1921 shows small dugouts with simply carved elongated solid ends. These have no strakes or gunwale poles. Two booms at both bow and stern support small platforms fore and aft. There is a stringer over the attachments and one near the hull. In one canoe the platform at one end is composed of longitudinal poles which extend some distance beyond the attachments farthest from the end, and a transverse pole which rests on the stringers strengthens this end of the platform, but still there is a wide space between the two platforms. Another photograph shows a very small dugout with a continuous platform of the usual Massim type.

Fortune (1932, p. 213) says:

"The canoes of Dobu do not have the huge spread of sail that the canoes of Kitava [the most easterly of the Trobriand Islands] use. They are heavier than the fast light canoes of Murua. Their pattern of construction is that of the Trobriands canoe. The Dobuans are not a seafaring people by love or by ability. Even their true wind magic is possessed by their women."

Fortune (1932) gives an interesting account of the ritual of the *kula*, or *kune* as they term it, which should be compared with that given by Malinowski for the Trobriands. Fortune has given me the following terms for the rigging of a Dobu *waga*: mast, *aliena*; the strong yard, *kunaia* or *sapsap*; the thin boom, *keyas*; halyard, *lisi;* rope at the fore end of yard which holds it down and is fastened to the fore end of the outrigger, *lasa;* rope from the same point and fastened amidships to the outrigger, *bwega;* rope from the center of the yard and fastened to the outrigger, *tapwa;* sheet or rope from near the end of the boom which is held in the hand, *ee;* fore and aft stays are unnamed. Most of this rigging is shown by Malinowski (1922, pl. 23).

The fine sailing boats of the D'Entrecasteaux Islands are described by Finsch (1888-a, pp. 213-214; 1914, p. 476), who says that these boats surpassed all others which he had previously seen. They are 29 meters long and are used for trading and war; they carry a great number of men. The keel consists of a large hollowed-out trunk; to it are fastened numerous crescentic rib-pieces to which clinker-

built, bent, side planks up to three in number are lashed (Finsch, 1888-b, pl. 6, fig. 3). This enables the craft to be much wider amidships and more like European boats. The ends of the planks are connected at bow and stern by a breakwater, which is usually richly carved and painted. Although the parts are tied together and the seams smeared with a kind of gum, bailing is essential. The pointed ends of the keel project some distance beyond the built-up hold. *Ovulum* shells, tassels of pandanus fiber, and other decorations are attached to stem and stern. The side planks are often painted (as with red and white fish in Finsch, 1888-b, pl. 7, fig. 8). Finsch (1888-a, pp. 213, 214) says:

> The float is almost as long as the boat itself and so thick and large that a dugout could be made of it. This is connected with the hull by ten booms which are attached to the float by double pegs [two pairs of undercrossed sticks]; the float, as first noted in the Trobriands, is very close to the canoe, they being only one meter apart. The booms are so thickly covered with sticks that a platform is formed along that side of the canoe. . . . These canoes carry a very large oval sail (the upper part of which is sometimes straight) of plaited matwork; they are 20 meters long, and run very fast before the wind.

Finsch (1888-a, p. 214) states that at Christmas Bay, the great bay of Normanby Island that faces north, there are only very small skillfully made canoes which hold one person. One was only 3 meters long. His illustration seems to be incorrect, at all events as regards the outrigger, as the five booms rest directly on the float while beside each boom a vertical stick is inserted into the float; these carry a rail. Nothing like this has ever been recorded. Finsch (1888-a, p. 224) describes and figures a canoe house on "Goulvain Island", Dobu, for a large war canoe. The gable roof of the canoe house reaches to the ground; the entrance is a large square doorway, above which tier upon tier of human skulls are placed.

A photograph of a Dobu canoe shows a single deep washstrake on each side with a short low topstrake added in the center; these are supported by rib-pieces apparently like the one figured by Finsch (1888-b, pl. 6, fig. 3) from Fergusson Island. The visible breakwater and end-erection are of the usual D'Entrecasteaux type. The float is as long as the hull; there appear to be 12 or more short booms, each with two pairs of tall undercrossed sticks. The platform is long, narrow, and continuous; its transverse poles are on a level with the top of the strake.

SUMMARY OF THE MASSIM DISTRICT

Throughout the greatest part of the Massim district there is a general similarity in the canoes which may be due in part to a common ethnical and cultural relationship but more particularly is due to the influence of trade and to a widely spread traffic in the sailing canoes themselves. Seligman says that trade went from the D'Entrecasteaux to Tubetube and probably to Wari, and from Tubetube mainly to the Alcesters and Murua. There was a western trade, but apparently none between Tubetube and Misima or the Louisiades. Murua *waga*, however, visited the Louisiades. The carvings of the breakwaters and of the end-erections of *waga* built in the Louisiades are so different from those of Murua, the Marshall Bennetts, and the Trobriands as to be easily recognized. Despite insufficiency and the intricacy of the evidence it is possible to indicate certain characteristics which presumably point to various cultural movements into the area, and further local developments have taken place.

The *gebo* dugout, which has no outrigger, appears to have been practically confined to Milne Bay.

I have described a double outrigger canoe in the Oxford Museum (fig. 148) which is labeled "Louisiades" and I see no reason to doubt this provenance, although, so far as I am aware, it is a unique record.

What may be regarded as the typical indigenous canoes of the Daui and Suau areas rarely have washstrakes. The bow and usually the stern of the dugout are prolonged into a horizontal projection which often is cut into a vertical board (fig. 141). It is carved and painted in the usual Massim style.

It may be noted that the "nose" of the *ma no,* as that of the *para no* of Rossel Island, is also a prolongation of the end of the dugout.

The small outrigger canoes employed in the greater part of the Massim district for fishing and for petty local trade are dugouts, usually with a single strake. In some canoes the ends of the strakes slope down fore and aft and are not closed in by breakwaters.

Usually breakwaters and often end-erections occur in all the larger outrigger canoes and both become especially prominent in the sailing canoes with two, three, or more strakes, which are clinker-built.

It is on the large sailing canoes and their gear that the natives expend their remarkable artistic skill. The solid ends and sides of the dugout, the ends of the float, and other parts of the canoe may be carved and painted; in addition there are carvings fastened on the outrigger apparatus and elsewhere. The ornamentation by means of streamers and fringes and especially of *Ovulum* shells is also highly characteristic of the Massim. It is not here possible, even were the data sufficient, to give an account of the distribution of the types of decorative motives, the whole study of which is very intricate. Extremely little is known about the significance of the decorative designs. I must, therefore, content myself with a brief description of the three main types of the carvings of the breakwaters and end-erections in the Massim district.

Type 1. The most widely spread type is that shown in figure 146, *a*. It is found everywhere, so far as I am aware, except in the D'Entrecasteaux and Amphletts. It is the characteristic type of Murua and the adjacent islands and is exemplified in the *nagega* canoe of the Trobriands. The breakwaters are large and asymmetrically bilobed and usually have a circular disc in one or both of the lobes. Each end-erection usually springs from, or may be tied to, or inserted into a groove in an elongated and often plain base lashed to the upper surface of the end of the dugout. Typically it is a richly decorated, elongated fretwork slab that slopes upward, the top of which is usually prolonged into a long flat blade or tang onto which is lashed a carved finial, termed *munkuris* in Murua and *riri* or *lili* by the Suau (fig. 147, *b*). Williams gives a drawing (fig. 160, *a*) of an end-erection (*taburi*) from an unspecified locality, in which the *riri* has a basal carving, the bottom of which is socketed to fit onto the tang of the *taburi.*

Illustrations published elsewhere: breakwater, *ragim,* Murua, Seligman, 1910, pl. 66. End-erections, Macgregor, 1897, p. 78; Egum Atoll, Ann. Rept. British New Guinea, 1899-1900, 1901, pl. 30. Finials, *munkuris,* Murua, Seligman, 1909-a, pl. C, (he refers to their magical significance); Trobriands, Lewis, 1925, pl. 33.

Type 2. At Utian (Brooker Island) and perhaps generally in the Calvados Islands, and also at Wari (Teste Island) there is a special type of fore end-erection (fig. 146, *b*). The basal part is low but it is provided with a tall angled spur which ends in a carved bird. Tied to the spur and parallel to it is a long-stemmed finial, the carved design of which seems to be characteristic of this type. I do not know whether the carving of the fore breakwater is peculiar to this type; the aft breakwater is small and plain, and there is no aft end-erection. The only book

illustration of this type is that given by Seligman (1910, pl. 67) of a canoe at Utian. Lindt took two photographs of two canoes at Wari in which this bow erection can just be made out. Probably all these canoes were made in the Calvados chain area.

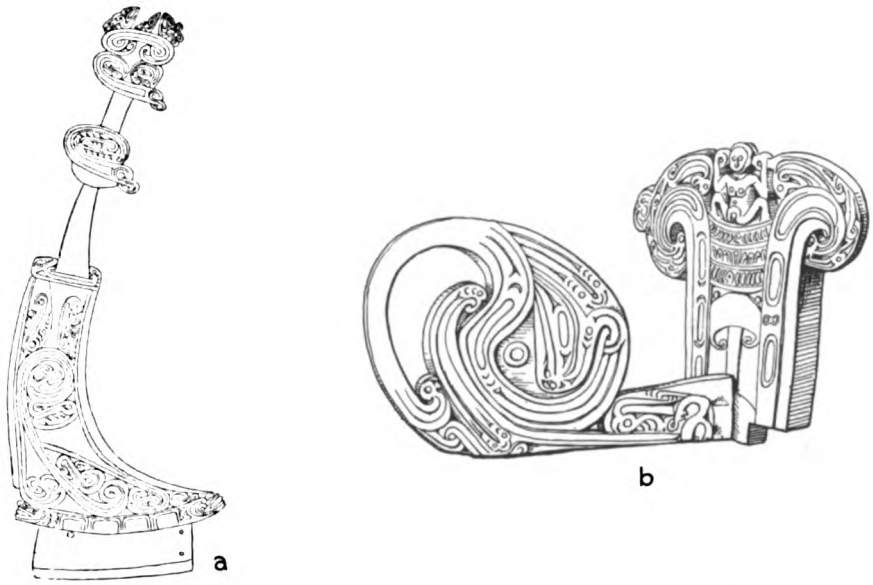


FIGURE 160.—Massim canoe carvings: *a*, end-erection (type 1) and a socketed finial (from Williams, 1930-a); *b*, typical breakwater and end-erection (type 3) of the D'Entrecasteaux Islands (Cambridge Museum); breakwater 14 5/8 inches high, 18 1/4 inches wide, end-erection 20 1/4 inches long and 12 inches high; the relative size of the end-erection is rather too great.

Type 3. This type is definitely characteristic of the D'Entrecasteaux group and the Amphletts, and it is now the prevailing type of the *kalipoulo* and *masawa* canoes of the Trobriands. Sporadic examples occur where the influence of the D'Entrecasteaux has spread, even so far as the Brumer Islands; specimens from Brumer Islands collected by the *Rattlesnake* in 1849 are in the British Museum.

The typical form of the breakwater (*bodawa*) has a more or less complete human figure or human figures, either realistic or conventionalized, at the center of its upper margin (fig. 160, *b*). The end-erection (*vagavaga*) is usually a rather small, more or less semicircular board, the main motive of which appears to be a conventionalized bird's head. Good photographs of this type from Kiriwina are given by Seligman (1910, pl. 65); from the Trobriands by Malinowski (1922, pl. 24), who gives a photograph (1922, pl. 26) of an end-erection (*tabuyo*); and from Wagifa, Goodenough Island, by Jenness and Ballantyne (1920, pl. p. 186).

Edge-Partington (1890, pl. 278) gives sketches of a breakwater, end-erections of types 1 and 3, and a finial. The various types can be seen more or less distinctly in the photographs of canoes to which reference has been given and in other illustrations.

The South Cape and China Strait areas are visited by canoes from other Massim areas and local canoes are sometimes built in imitation of these craft. It must therefore be expected that variations will result, and there are examples of what appear to be actual hybridization. For instance, in the previously described

amuiua of the Suau area, the breakwater (*baragi*) is somewhat of the Murua type; the end-erection (*taburi*) is of type 3 but is enlarged and otherwise modified, even to bearing a tang (which is not visible in the photograph) for the attachment of a finial which properly belongs to type 1 (fig. 161). On the other hand it is just possible that these mixed types may be relics of a common type from which the other types have specialized in different directions.

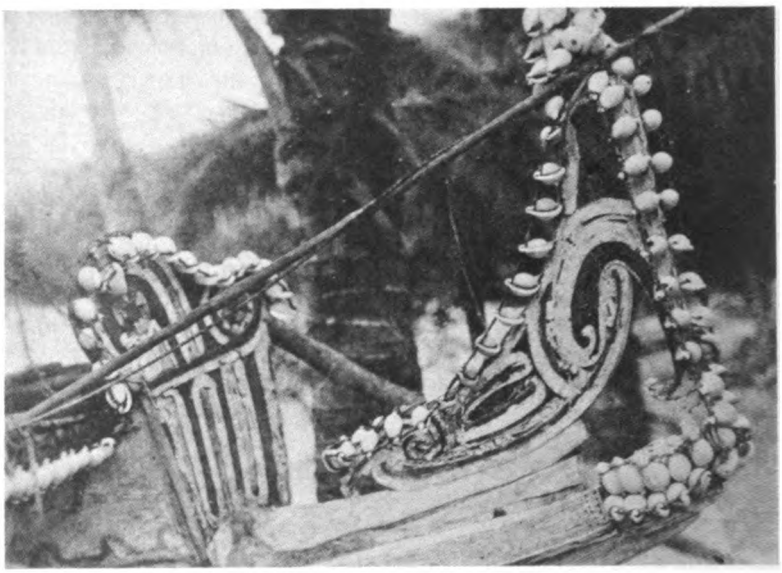


FIGURE 161.—Breakwater (type 1) and an end-erection (mixed types 1 and 3) on an *amuiua,* Suau (photograph by F. E. Williams, 1932).

The smallest outrigger canoes may be simple dugouts, the booms resting on the edges of the dugout, to which they are lashed as in the *kewo'u* of the Trobriands. In the larger canoes there is a strake and the booms of the outrigger pass through the strake on that side and rest on the edges of the dugout as in the *kalipoulo* of the Trobriands. In a model canoe in the British Museum from the Louisiades there is a strake on each side but the booms are inserted into the dugout, but this may not have any significance. In the *ma no* of Rossel the booms pass through the strake and their ends rest on the off edge of the dugout; the same occurs in the *lia no* of Rossel, but in this canoe the booms are also lashed to the under side of the two central longitudinal poles which are fastened over the lower limbs of the knees. When there are more than two strakes the booms pass through the middle strake and over the lateral longitudinal poles to which they are lashed, as in the canoe at Silosilo, and in the *masawa* and the *nagega* of the Trobriands. The *nagega* is practically the same as the trading *waga* of the greater part of the Massim district.

Throughout the district the booms are short in the large canoes, and each is connected with the long massive float by two pairs of undercrossed sticks. A platform of longitudinal poles that extends continuously over all the booms and is usually a well-built structure is characteristic of the district. In the western part of the mainland area (Bonabona, Isuisu, Daui) and occasionally in the Brumer Islands, the outer booms are free and the platform extends over the central booms only. On Goodenough, Fergusson, and on the opposite mainland the converse is

found as the canoes have two booms rather close together at the bow and at the stern, which carry a platform; the longer central space is clear, but in the larger canoes there may be a free central boom attached to the float in the ordinary manner. Such an arrangement is peculiar to this limited area. The free condition of the fore and aft booms is also characteristic of the canoes of the Papuan Gulf, where we find forked booms with a single pair of undercrossed sticks.

There are interesting variations in the rig of the sailing canoes, especially in the stepping of the mast and in the character of the sails, that may be significant. Relatively small outrigger canoes may have a temporary rig; in the large trading canoes there is either a temporary or a permanent mast.

Canoes with an oblong, interplaited palm-leaf sail. Neither Macgillivray nor Abel say where the temporary improvised oblong coconut-palm leaf sail is stepped in the canoes of the South Cape area. Armstrong says that the mast of a canoe at Isuisu, which was supported by a mast-shore, was stepped on the foremost boom of the platform; at Daui he saw a canoe with a mast stepped amidships supported by a mast-shore from the platform. The interplaited palm-leaf sail had a yard and a boom; this rig indicates an eastern influence. The *aiyebu* of Goodenough Island, according to Jenness and Ballantyne, has a similar kind of sail. A spar on the outrigger side of the sail is stepped well forward on the outrigger, but there is also a very short mast on the off side of the sail (fig. 159).

Canoes with a triangular, sewn leaf, Oceanic lateen sail and an eccentric mast. According to Malinowski (1922) the mast of the *masawa* of the Trobriands and Amphletts, as in the sailing canoes of the D'Entrecasteaux, is attached to the fourth boom. His plate 21 shows a *masawa* with the mast inclined over the platform and supported by a mast-shore rising from the fore end of the platform; his plate 40 shows a *masawa* with the mast well forward and apparently stepped on the off gunwale; and his plate 41 shows the mast well forward, stepped within the hull, presumably on the off side and supported by a mast-shore from the platform. (See fig. 156.) However, Whitehouse refers to the mast of the Trobriands canoe as stepping on the float and as being supported by a mast-shore. The mast of the true sailing *waga* of Goodenough Islands appears, from a photograph taken by Jenness, to be stepped on the off gunwale. The sails are triangular and are usually made of sewn pandanus leaves, or according to Jenness, of sago-palm leaves sewn together, but Whitehouse says of *moi* leaves.

Canoes with flattened-oval sewn leaf sail, a variant of the square sail, and a central mast. There appear to be three types of canoes with a more or less permanently fixed central mast: 1, that with a mast-shore which springs from the platform and is lashed to the lower third of the mast; 2, that with a horizontal pole; 3, that with a shoe-spar, the spar portion extends well over the platform and is supported normally by two long pairs of undercrossed sticks inserted into the float; photographs often show these characteristic structures. Thus, in spite of the lack of descriptions, it is possible to make provisional deductions. Although the actual stepping of the mast is not visible it is, presumably, fairly uniform as to the shoe-spar, but our knowledge is sadly deficient as regards the mast with a mast-shore. In each, the sail is of an oval shape, the flat sides supported by spars, a yard and a boom. The sail is made of leaves, usually of pandanus, sewn together.

1. Mast with a mast-shore. Photographs and other information show that this type has been seen at Bonabona, Daui, Wari, Utian (Brooker Island), Tagula (Sudest), and Rossel, where the type is copied from Tagula. A photograph by Lindt of a canoe at Wari (Teste Island) shows an oblique rattan lashing instead of a wooden strut.

2. Mast with a horizontal transverse pole. Macgillivray saw a canoe in Coral Haven that came from the eastward. The mast was "stepped into a board in the bottom" and its lower end "lashed to a stout transverse pole". This is evidently the same arrangement as that shown by a model collected by an officer on board the *Rattlesnake* and now in the British Museum (fig. 155) and in a photograph taken at Rossel by Armstrong.

3. Mast with a shoe-spar. Abel does not say how the mast of the *vaga ue* of the South Cape area is stepped; it is certainly a fixed mast, but in Armstrong's manuscript notes the mast of a *waga* at Silosilo in that area is stepped on a shoe-spar (*kokoile*). His sketches show that the stepping is very similar to that described by Macgillivray for the vessel that visited the Brumer Islands in 1849, but in this the shoe was a "massive bent timber" secured by strong lashings to a "long cross beam" which stretched over the platform; the free end was carved into the figure of a bird. The end of the *kokoile* is indicated by Armstrong as being carved (*doha kumkum*) like a *kumkum* bird. The free end of the shoe-spar is supported on two pairs of very long undercrossed sticks inserted into the float. According to Armstrong's description the arrangement of the stepping of the mast of the *lia no* of Rossel is somewhat similar to that seen by him at Silosilo, but at Rossel the booms pass through the bottom strake, not the middle strake, and are below the central longitudinal poles, whereas in the Silosilo canoe the booms lie well above them.

There is definite information that canoes with a shoe-spar have been seen at Silosilo, Suau, and Rossel, and photographs show the free end of a shoe-spar in canoes at Samarai, Brumer Islands, Tubetube, and Panaieti.

The large sailing canoe of Nada and Murua, and the *nagega* of the Trobriands have the central fixed mast, but I have not been able to find any description as to how it is stepped. In one or two photographs a strong spar is seen stretching over the platform; we may therefore assume that a shoe-spar is the typical arrangement and that these craft are similar to my generalized description of a *waga*.

Canoes with tripod masts. The tripod mast noted by Powell at Wari was evidently similar to that described by Macgillivray for Coral Haven canoes, where the mast proper was "stepped with an outer inclination into a narrow shifting board in the bottom of the canoe".

The paddles of the Massim district are beautifully made with fine artistic feeling. The blade is a long pointed oval, the tip of which is often thickened to give it strength; there may be a slight median ridge which runs down from its base. The junction of the shaft with the blade is usually carved in an appropriate manner. Typically the grip is carved with variants of the animal and bird design. I tacitly assumed (1894, p. 201) that the animal was meant to represent a crocodile, but this is not certain; I gave several illustrations of this motive (1894, pl. 20, figs. 187-190, 194, 196, 198, 203-205), and Graebner (1913-a, fig. 17) gives a variant. Illustrations of paddles are given by Edge-Partington (1890, pl. 284, nos. 1, 2; pl. 285, no. 1).

There are shown in a number of museums wooden blocks for reeving a rope, but there is no information regarding them. Of two old blocks from the Brumer Islands, in the British Museum, one is in the form of a bird and the other has half of a human figure projecting from the end (Edge-Partington, 1890, pl. 277, figs. 5, 6); another has the form of a bird (Edge-Partington, 1890, pl. 276, fig. 4).

Tentatively we may recognize several areas within the Massim district:

1. The mainland and the neighboring islands. The arrangement of the outrigger booms and the nature of the platforms are very different in the western Massim mainland from those of south Goodenough and Fergusson Islands and the opposite mainland; both differ from those prevailing elsewhere. Milne Bay with its outriggerless dugouts lies between these two areas. In this sub-area temporary quadrangular, interplaited leaf sails occur, the mast for which, if there is one, is

very insignificant. Sailing canoes with an oval sail and a central mast, which have long been reported in this area, may be regarded as not indigenous to it.

2. The D'Entrecasteaux Islands. This group may be regarded as the headquarters of the trading canoe with a mast stepped forward and a permanent triangular sail; the breakwater and fore end-erection are of type 3. According to Malinowski this type of canoe has been recently adopted in the Trobriands, where it is known as *masawa*.

3. A central mast carrying an oval sail characterizes the rest of the Massim islands. It seems as if the mast with a mast-shore is prevalent in the southern islands of the Louisiades, and that with a horizontal transverse pole is confined to them; whereas the shoe-spar extends from the Trobriands to Nada and westward to Panaieti. This type has, however, been adopted by or traded to outlying parts, such as Rossel, Wari, Tubetube, Suau, and even to Silosilo on the mainland west of Fyfe Bay. It must always be remembered that sailing trading canoes visit distant islands and, unless inquiries are made, their presence in any one locality may have no special significance.

I regard the horizontal transverse pole as a transitional form that gave rise to the shoe-spar, the mast-shore being the original form. I further suggest that in order to enable the mast to bear the strain which sailing involves and for which the shoe of the spar is obviously inadequate it became necessary to reintroduce some kind of mast-shore, and thus the forked spar (*soasoa*) was adopted which had then to be stepped in a manner different from that of the original mast-shore. The evidence seems to suggest that this final modification took place in the Woodlarks and neighboring islands.

So far as the islands of the Massim district are concerned we may for the present assume that the canoes of the southern Louisiades and especially Rossel belong to a separate and perhaps the oldest of the immigrant cultures. If we accept the coiled pottery as being older in date than the modeled, then it seems probable that the *waga* with a central mast and oval sail belong to an older stratum of culture-migration than those vessels with an eccentric mast and triangular sail.

Farther west, the double sailing canoe of the Mailu has a central mast stepped on one side of one hull with a notched, triangular (crab-claw) sail. The crab-claw sail is used on the multiple canoe or *lakatoi* of the Motu; there are two masts, each with a sail stepped amidships, a short distance apart, in middle line of the platform. Until very recently there were still survivals of what doubtless was the older type of sail of the *lakatoi*, a quadrangular mat sail supported by two vertical poles which may be related to the quadrangular interplaited palm-leaf sail of the Massim of the mainland, and of Goodenough Island.

This is about as far as the existing evidence permits us to generalize. Future data may necessitate a reconsideration of these conclusions.

NORTH COAST OF PAPUA

West of East Cape are: Bentley Bay; Awaiama (Chads) Bay; Taupota; Cape Frere; Bartle Bay; Jiwari, Wedau, Wamira; Goodenough Bay; Boianai, Paiwa; Cape Vogel, Ari or Iasi-Iasi; Collingwood Bay; Phillips Harbor, Rainu, Wanigela, Keppel Point; Cape Nelson; Musa River; Dyke Ackland Bay, Oro Bay; Buna; Gona or Holnicote Bay; and the rivers, Kumusi, Ope, Mamba (Mambare), Gira, Eia, Wuwu, and Waria. The last three have their mouths west of the boundary.

Armstrong photographed in Awaiama Bay small elegant dugouts with long pointed ends; they have two or three booms and one or two pairs of undercrossed sticks, and hold one to three persons.

Goodenough Bay

Newton (1914, p. 41) says:

> "Up the north-east coast there are no canoes that sail. At Taupota and Wedau they are just dugouts, shaped stem and stern, with an outrigger lashed to the side a few feet away. At either end of this outrigger are small platforms to carry food and such like. . . The seat is just a narrow piece of wood, and the canoe is so narrow that there is room for one foot only in the width."

The Rev. Copland King informed me in 1904 that from East Cape to Bartle Bay the canoes have a heavy float as long as the hull, with a platform at each end. These are quite the common kind throughout the east end and among the islands (compare with southeast Goodenough Island). He saw on the Wamira beach long canoes with grooves for the strakes; these had carved ends which were beyond repair, and the natives said they had lost the art of making that kind.

King (1894, pp. 92 ff.) gives the following vocabulary for Wedau, Wamira, and Jiwari, which shows that craft of the D'Entrecasteaux type frequent that region, even if they are not made there: canoe, *wa*; large canoe, *waga*; prow and stern, *giana*; bow, *mutuna*; side [strakes], *babana*; bottom, *ipuna*; hold of canoe, *gamona*; line of carving, *tevoga*; carved end, *kanagara*; booms, *po*; connectives, *tutuna*; float, *g'amana*; stringer above float, *rautete*; mast, *aiari*; sail, *kuka, nala*; paddle, *woe*; oar, *l'are*; rudder, *iabiabi*.

Ray has given me the following additional words: gunwale lath (midrib of sago leaf), *kinibaba*; carved breakwater, *onota*; carved end-erection at bow, *tabulo*; halyards, *lavurai*; anchor, *logona*.

Atkinson (1922, p. 53) gives a few notes and a drawing of a canoe and of the villages of Boianai on the south, Paiwa on the north of Goodenough Bay, and Ari (Iasi-Iasi) at Cape Vogel:

> After a tree is cut down and trimmed it is hauled to the village where it is hollowed out and a fire made inside to dry it. There is a long ledge at the bow and a shorter one at the stern of the hull (*waka*), also called *bognono* at Ari. Three holes are cut below the gunwales through which strong pieces of wood are passed; to these are lashed the three straight booms (*geru*). The float (*kiukiu*), or as it is called in Ari, *amana*, is bluntly pointed at each end. Each attachment consists, in his drawing, of a pair of undercrossed sticks (*gidada*). A platform (*vatara*) made of longitudinal poles of back palm or other light wood is laid over the booms. The ends of the platform which extend some distance beyond each side of the hull are secured by a pole which is lashed to each outer boom. Bow, *mutuna* (*manginuna* at Boianai); aft, *murina;* hold, *sinena;* paddle, *voi.*

Dr. P. de Rautenfeld gave me photographs of canoes of Goodenough Bay taken by him in 1925. The photograph taken at Rautsewa near Cape Vogel shows the hull to have a long rake ending gradually in a point, and a narrow opening. A gunwale pole may be present or absent; there are three booms; the connectives slant over the boom or are undercrossed; the usual square platform is present. A canoe at Baniara, on the north shore of the bay, is very similar but the ends expand as in the Orokaiva form, and there is no gunwale pole. There are three straight booms which are attached to the distant and very long float by two pairs of more or less parallel sticks that converge over the boom. There is the usual typical platform.

So far as the canoes are concerned it seems evident that the Massim influence ceases at Bartle Bay, on the south coast of Goodenough Bay. From Boianai westward there is usually a short, light outrigger some 8 feet distant from the hull and a square central platform. King has seen canoes used for crossing still water that were cut in half and with the end stopped up with mud. (The ends of the

square-cut canoes of the Delta Division are similarly treated.) He never saw a sailing canoe belonging to the northeast coast, though he has seen a canoe with a coconut mat sail which came across from Fergusson Island to near Cape Frere.

Newton (1914, p. 42) writes:

"Farther up the coast [beyond Goodenough Bay] the trees of which the canoes are made are larger, the outrigger farther away, and a large platform built in the middle, stretching out over the outrigger on one side and over the dugout on the other. The platform is floored with split palms, and may be anything from 4 to 8 feet square. Here the old men sit in solemn dignity, and there is a fireplace of stones and earth in the centre. . . The native paddles are about 4 to 5 feet long with an elliptic flat blade." In paddling, the natives "bend well forward, chop the blade in the water and pull the canoe up to the paddle, and as they finish the stroke they draw the paddle out of the water striking it with a rat-tat against the side of the canoe, working in perfect time, and singing and shouting together as they go along paddling first on one side and then on the other. One man sits in the stern and steers with a paddle correcting the zigzag motion."

Collingwood Bay

Information about the canoes of Collingwood Bay is scanty. At Augo village, west of Phillips Harbor, Macgregor (1892, p. 13) saw canoes "made of a single tree, about 35 to 40 feet long, and about 2.5 feet in width, and sharp at each end. They are provided with a very small outrigger [float]; there is a platform about 12 feet square."

Macgregor (1897-a, p. 27) describes the war canoes at Makimaki, about three miles south of Keppel Point, as very long with the outrigger at a great distance from the hull. Le Hunte (1900, p. 22) says: "The shape of the canoe [at Maisena, just north of 9° 30′ S.] was quite different from that of the Ope [Orokaiva district] ones, being ornamented instead of the long curved sharp-pointed end of the latter."

An illustration of a canoe at Kumabun Creek is given by Newton (1914, pl. p. 34). The slender dugout tapers at each end to a point, there are no gunwale laths. The outrigger consists of three straight booms which extend for a short distance on the off side. Apparently the attachment consists of three vertical sticks, two on one side of the boom and one on the other. The float is a long way from the hull. About half of this distance a platform covers the booms and extends beyond the other side of the hull; it consists of transverse poles which rest on longitudinal poles supported by the booms.

Dr. P. de Rautenfeld gave me some photographs taken in 1925 of canoes at Mukawa, in Collingwood Bay, south of Cape Nelson (fig. 162) which show that:

The long narrow hull rakes up fore and aft and each end has the same characteristics as canoes farther west. A gunwale lath extends along the whole length, or along only a portion of it. There are three straight booms. Usually the float is rather short and is at a long distance from the hull. The attachment consists of two or three vertical sticks or of three pairs of sticks that slant over the boom. One small canoe has two booms and two pairs of parallel sticks that slant over the boom. The large central platform extends for some distance on each side of the hull and it may be provided with a rail on two or three sides. In these canoes the outrigger apparatus is nearer to one end than to the other.

Chinnery has given me a sketch (fig. 163) of a canoe (*wa*) of the Arufama tribe south of Cape Nelson. It shows three booms (*giato*) and is otherwise like the canoes previously described, but it has two pairs of parallel stick connectives (*batoto*) that cross under the boom in a peculiar manner (fig. 163, *a*); unfortunately the lashings are not shown, apparently they are not typical undercrossed sticks. A thin stick is lashed under a boom where it rests on the gunwale pole

(*apitana*) and immediately below is another thin stick which passes under the pole, its free ends being tied to the other thin stick and the boom so that they bend upward (fig. 163, *b*). This rather flimsy arrangement looks as if it were a degenerate structure. Float, *lamana*; platform, *meagahana*; paddle, *bodi*; steering paddle, *guniga*.

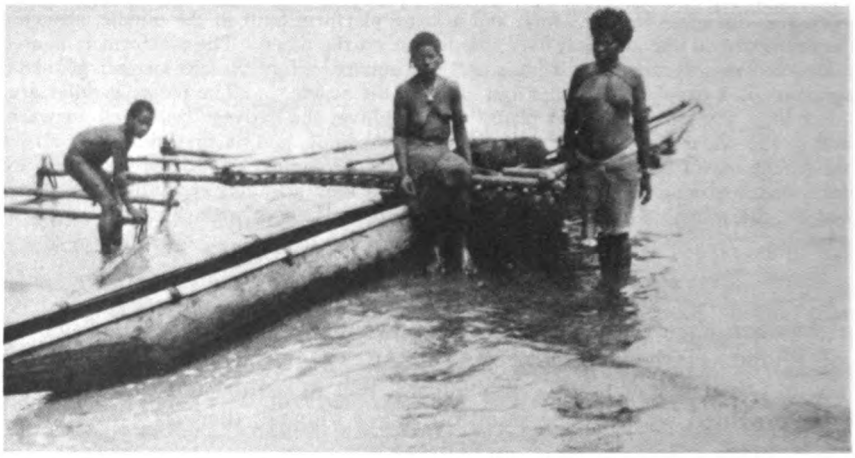


FIGURE 162.—Canoe at Mukawa, Collingwood Bay (photograph by Dr. P. de Rautenfeld, 1925).

NORTH COAST OF PAPUA WEST OF CAPE NELSON

No canoes were seen by Macgregor (1897-a, p. 23) among the Euda tribe at Baruga village which is some distance up the Musa River. He says, however: "their rafts are made of the form of an isosceles triangle, of small logs, sufficiently large to carry each two to four light men. They are the handiest and most manageable rafts we have seen anywhere."

Inland from Ketakerua Bay, west of the Musa, are the Agaiambo, who have been driven to take refuge in a swamp. Winter (1904, p. 15) says of them:

> "Their canoes, which are small, long, and narrow and have no outrigger, are hollowed out to a mere shell to give them buoyancy . . . these craft, which retain the round form of the log, are exceedingly unstable; but their owners stand up in them and pole them along without any difficulty."

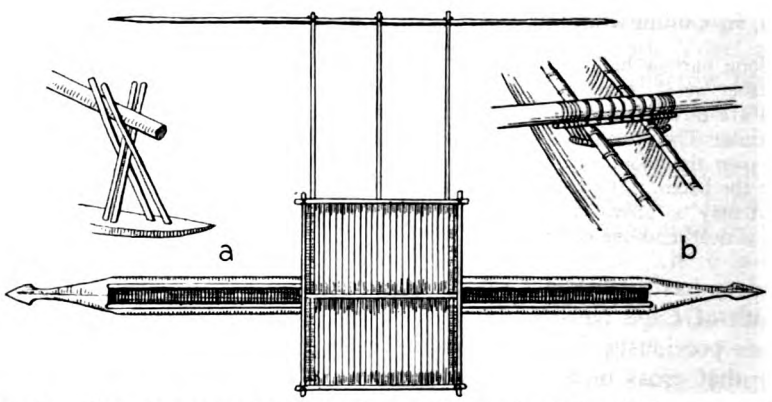


FIGURE 163.—Plan of a canoe (*wa*), Arufuma tribe, south of Cape Nelson: *a*, undercrossed connectives; *b*, method of fastening the boom (after a drawing by E. W. P. Chinnery).

Macgregor and others in subsequent visits to the coast as far as what was then the British boundary saw canoes at various places but the descriptions are so general that there is no need to refer to them.

In reply to a request for information about the canoes of the Northern Division of Papua, my friend the late W. N. Beaver sent me in 1915 a remarkably full account compiled by himself in collaboration with E. W. P. Chinnery and illustrated with sketches and photographs. I have recast the manuscript but the data are given as received.

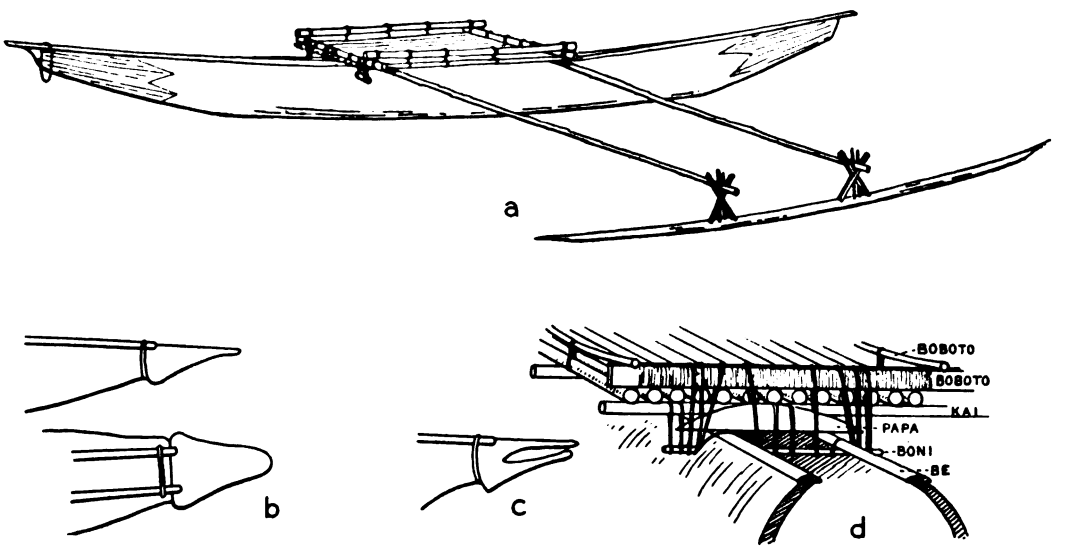


FIGURE 164.—Dugout canoe, Orokaiva: *a*, canoe (*ma*) (after sketch by E. W. P. Chinnery); *b*, side and upper views of a bow; *c*, "crocodile mouth" bow (from Williams, 1930-b, fig. 15); *d*, attachment of platform to hull (*a* based on photographs by Chinnery and *b-d* on diagrams by Williams, 1930-b, figs. 14, 15).

The native names of the Sebaganderi, of the Yega tribe, which is the tribe in the neighborhood of Buna, are metioned first; those of Binandele are mentioned second when there is any difference between them. The Binandele people, according to Chinnery and Beaver (1916, pp. 158-161), originally lived up the Kumusi River, about 8° 30′ S. and just east of 148° E. They migrated first to Eraga, high up the Mambare River, and then occupied the middle and lower reaches of that river and the lower reaches of the Gira, driving the now extinct Dogi and Gilita tribes before them. The whole coast line from Oro Bay in the south to Eia River in the north and for a considerable distance inland is occupied by the Orokaiva, or peoples speaking Binandele and kindred dialects. An excellent account of these groups is given by Williams (1930-b).

All canoes in use throughout this area are of practically the same type (fig. 164). Those in use at the extreme limits of navigation in the rivers are naturally small; they extend up stream for 60 to 100 miles according to the size of the river.

The canoes (*nga, ma*) are simple dugouts and are never built up in any way. The opening (*nga be, ma be*), "mouth of the hull" (*nga, tamo, ma tamo*), is very narrow. The bow (*nga kopiri, ma kopuru*), "canoe head", turns up a little and may be carved into a blunt point (fig. 164, *b*). Some canoes are carved into divergent jaws (*ingaba be*), "crocodile mouth" (fig. 164, *c*);

the stern (*nga ambo, ma ao*), "canoe buttocks", is a trifle lower than the bow, but always well above the water. A shallow carving (*dengoro*), "ear", ends in a zigzag at each end, without which it is said the canoe will not travel quickly. Canoes are usually painted red (*mainema*) with burnt red earth. Semicircular black marks (*ove*) are painted round the holes through which the lashings of *sega* attaching the gunwale lath (*nga be, ma be*) to the hull (*tamo*), "skin", are passed. The lath usually projects slightly beyond each end. *Be*, "mouth or opening", also applies to the opening of the hull and to its edges. River canoes nearly always have, at bow and stern, a mooring rope of plaited lawyer cane or of *sega* which terminates in a ring through which the mooring pole is thrust (fig. 164, *a*). The ends of the gunwale laths may be lashed together by a served cord (fig. 164, *b*).

The single outrigger has two straight booms (*tu*); the float (*samono, tauono*) is a thin pole pointed at each end and shorter than the hull. An attachment consists of three, or sometimes four, pairs of sticks (*gi*), "leaf" or "spear" (the name may refer to the swollen pointed ends that are sometimes carved on the sticks); they are made of black palm, *goropa* wood, as are the pig spears (*oki*); they are driven into the float and lashed to the booms with *sega*. The typical arrangement of the sticks consists of two pairs of undercrossed sticks and between them a pair of vertical sticks that embrace the boom (fig. 165, *b*), or there may be three pairs of undercrossed sticks, as at Buna and Kumusi.

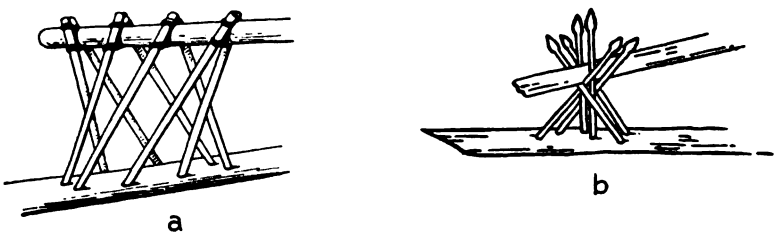


FIGURE 165.—Connectives, north coast of Papua: *a*, one type of connective on the Wuwu River (after a photograph by E. W. P. Chinnery); *b*, typical connectives of Orokaiva canoes (after a sketch by Chinnery).

There is also another arrangement on the Wuwu River. The platform (*paporo*, Williams calls it *ma-bua*) extends for a short distance over the booms on which it rests, and may extend to 2 feet over the opposite side. The following description of the platform is taken mainly from Williams (1930-b, p. 74). Along the two rims of the hull are laid split rails or slats (*be*), their upper surface being rounded. The actual supports for the platform are two pieces of wood (*papa*) shaped in a low segment of a circle; these are laid transversely on the *be;* they are slightly hollowed out on the upper side so as to form troughs in which rest the two transverse poles (*kai*) that form the basis of the platform. The platform is made fast to the hull by being firmly lashed to stout pieces of palm wood (*boni*), one at either end, which pass through the side of the hull and project slightly beyond on each side (fig. 164, *d*). The floor of the platform is composed of light longitudinal sticks which rest on the *kai;* their ends are kept in position by a short pole or piece of wood (*boboto*). On each side a longitudinal *boboto* is placed above the transverse ones; these thus constitute a low bulwark around the platform. The platform is used for passengers, cargo, and food, a fireplace with an earth floor may be made upon it. Beaver did not mention the *papa;* perhaps it is not always present.

Williams (1930-b, p. 75) says that the size of a canoe varies with the district—coast canoes are generally of considerable size. A medium-sized canoe measures 25 feet, total length of boom 15 feet, length of float 14 feet. Leo Austen gives length of hull as 39 feet 8 inches, depth 1.10 feet, length of platform 8.6 feet, breadth 6.9 feet, boom 18 or 19 feet, float 18 feet 1 inch (Williams, 1930-b, footnote p. 75).

The canoes are propelled by paddles (*sarau, tarau*) (fig. 166), or when rapids are being passed by poles (*orogo, oro*), for punting; the punters stand with one foot on each gunwale; there are no seats. The helmsman sits in the stern and is always provided with a good broad-bladed paddle (*bibiri*). These craft are very light and if swamped while in the water can be emptied by rapidly jerking them to and fro while the men are swimming alongside. Bailers are made of half coconut shells or of sections of sago spathes.

When traveling from river to river, where there are bars at the mouths, the river canoes never put out to sea, but they are dragged along the sand of the sea beach, even when the distance is great.

Sails were never used in the past, but now a very small one of imported cloth or of coconut-leaf mat, rigged somewhat after the Port Moresby fashion, is occasionally used when sailing before the wind. The sail has obviously been introduced by returned laborers or police.

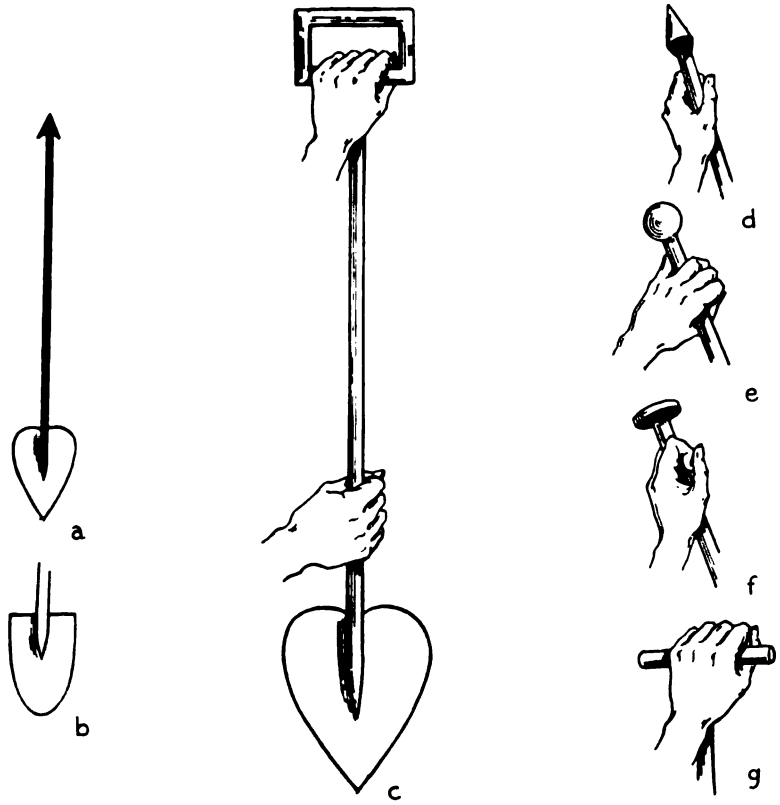


FIGURE 166.—Types of paddles and methods of holding paddles, Orokaiva, Binandele group: *a*, common type; *b*, another form of blade; *c*, a variant; *d*, *e*, *f*, common types of grip; *g*, T crutch type of grip; *g* and *c* are used in the north with variations which appear to be due solely to the whim of the maker (after drawings by E. W. P. Chinnery).

Various trees may be used in the manufacture of canoes, the most esteemed of which is *pota* of the family Lauraceae (cinnamon tree ?) on account of its scented wood which is believed to have the power of calming the sea. (It is possible that a wood which is rich in essential oils might, when new, exude sufficient oil to prevent the breaking of the waves.) During hunting expeditions men generally take note of any suitable young trees, cut the undergrowth around them, and mark them. When of a sufficient size they are cut down and either the hull is dug out on the spot or the log is taken to the village. If a man should steal a tree marked by another man, the latter would make medicine and eventually the thief's canoe would break.

The owner of a tree is assisted by his friends in dragging the log to the village. Food is cooked, the making of the canoe is discussed, and the next day

the owner and his family set to work. The words "Joviro siruga joviro" are sung continuously as the working song. *Tau* is the Binandele name for the small feast made on the completion of a canoe. When the canoe is launched the people blow shell trumpets and in other ways signify the importance of the occasion, while the owner sits on the platform with the village children and is paddled about by his friends. So far as is known no ceremonies or taboos are connected with ordinary canoes.

Canoes may have names, usually the names of living or dead relatives. The Buna people say that if a canoe is named after a living person it must be given to him.

Special war canoes of distinctive type apparently are not known, but canoes used for fighting would naturally be larger than the ordinary ones. The Binandele say that when they are about to go on a raid they want new canoes, so the fighting chief gives orders for new ones to be made and visits the villages, giving to each a canoe adz. Each village selects its tree, and, when felling it, the men address it in the name of the dead person whom they are about to avenge, saying, "We are cutting you down and we are making a canoe for you to visit your slayers and to pay for you." This spiritual state (*kotembo kotembo*) of the canoe is equivalent to that of the new house posts in the clubhouse (*oro*) at certain times. When he is ready the chief sends word to the canoe-makers and all finishing touches to the canoes are done at one time. Word from the chief is always awaited because disaster in the fight would occur if a man were to finish a big canoe before the chief had finished his. Finally the craft are painted red, launched, and tested for seaworthiness. The ensuing feast is called *ia urari,* "dance to plant." that is the "launching dance." The following charms are employed: The head of an eel (*boroto*) is burned in the fire and rubbed on the bow of the canoe to give it slippery qualities, and that of a watersnake (*mambu*) is similarly used to give speed. A light pithwood (*peteu*) is tied on the bow to give lightness and as a charm against heavy seas. The platform is decorated with croton (*simbiri*) leaves. The salt-water people use the head of a *borita* fish and that of an eel (*opuchi*) as above. Probably these charms are in general use and not restricted to war canoes.

Canoes are made almost everywhere, but the men of certain villages are more expert and possess a better supply of suitable trees. A trade in canoes is unimportant and indeed is scarcely known. No definite legend has yet been obtained concerning the origin of canoes.

Williams (1930-b, p. 73, pl. 16, *b*) says that along the upper reaches of the rivers canoes are seldom seen, their places being taken by temporary though strongly made rafts: "A primitive raft (*enga*) is constructed of half a dozen logs with two cross-pieces. Underneath are placed one or two much larger logs, which, though quite unattached, remain in position and buoy the raft upwards. An even cruder makeshift is an *enga* of banana stalks."

Beaver (1916, p. 162) gives these names for a canoe: Yarawe, a short distance up the Waria, *wa*; Maiwai, farther up the river, *wa*; Tahari, upper reaches of the Eia and Gira rivers, *waka*. It is clear that these outrigger canoes are not derived from indigenous river craft but have spread up the rivers from the sea, and thus the old Austronesian name is preserved.

Immediately west of the boundary of Papua is the Gira or Ikore River, where the same type of canoe is found. On the Wuwu River the canoes have two forms of attachment of which one is the usual type with two pairs of undercrossed and one pair of vertical sticks; the other (fig. 165, *a*) has two divergent

pairs of sticks which are parallel or slightly convergent over the boom and two pairs of central sticks which converge over the boom. This arrangement, so far as I know, occurs in no other locality except the estuary of the Fly (fig. 120, *e*). The typical arrangement occurs on the Waria, where the terms are: canoe, *wa*; gunwale pole, *bari*; platform, *begu*; boom, *tama*; connectives, *tama paki*; float, *kivio;* paddle, *wawa;* steering paddle, *wawa punga.* Thus the Orokaiva type of canoe extends to the Wuwu and Waria, where, as a rule, the hulls end more abruptly and are blunt and thus have a less elegant form. The foregoing information is based on photographs of numerous canoes given to me by Chinnery.

Chinnery (Report 4, 1931, p. 29) says that the outrigger canoes of the Suwena, who live close to the Morobe Government Station, are similar to those of Binandele, one of the Orokaiva tribes. The Suwena originally came from the Mambare division of Papua.

MANDATED TERRITORY OF NEW GUINEA

HUON GULF DISTRICT

On Rüdiger River, at Morobe, Krieger (1899, p. 160) says that the canoes are so large that they hold 25 to 30 persons, but farther south canoes are replaced by rafts of 4 or 5 long trunks lashed together with creepers. A sort of bench is erected on them to keep trade goods dry and they support only one or two people.

The canoes on the north coast of Huon Gulf, at Labo in Herzog Bay, at the mouth of Markham River, and on that river (Neuhauss, 1911, vol. 1, figs. 252, 17), appear to be of very much the same type as those of the Orokaiva. The ends are produced to a narrow pointed shelf and the two booms seem to be attached to the short float by two pairs of undercrossed sticks. Owing to lack of space on the small islets of Herzog Bay, the natives build crossbars on posts in the water on which the canoes are drawn up at night (Rüdiger, in Krieger, 1899, p. 160). Krieger also says that all along Huon Gulf the canoes are simple and carved only below the bow. In 1873 Moresby (1876, p. 284) noticed that on the north shore of the gulf the canoes were different from any he had seen before. Neuhauss (1911, vol. 1, fig. 19) shows a raft on the Markham consisting of a number of poles, the longest in the middle and decreasing on each side, and square aft; on it are laid two transverse poles, several longitudinal ones on these, and transverse poles above the latter are covered with leaves (?). Finsch (1888-b, pl. 8, fig. 6) gives rough sketches of two canoes of Huon Gulf, doubtless the north shore, with two long booms and a mast carrying a rectangular sail. He notes the surprising number of small canoes he saw in the gulf (1914, p. 478).

On the south coast of Huon Peninsula live the Bukaua and along the southeast corner and at Finsch Harbor, the Jabim. The Tami Islanders are closely allied. To the same cultural province belong the Siassi Islands and Rook Island. In its ship-building and trading activities and artistic skill this region is strangely like the Massim, but there are few details in common. For exuberant life there must be psychological stimulus independent of the quest for material benefits. This is amply supplied by the *kula* system for the Massim, and here it appears to be furnished by the *balum* cult (Haddon, 1917, p. 346; 1920-b, pp. 252, 272) that spread from Huon Peninsula to the islands and possibly to the extreme west of New Britain. There is evidence of an older *tago* cult that spread from Magilep, west New Britain, to the Siassi and Tami Islands as the result of a definite migration (Bamler, in Neuhauss, 1911, vol. 3, p. 507).

TAMI ISLANDS

The Tami Islanders, according to Bamler (Neuhauss, 1911, vol. 3, p. 489), are purer Melanesians than the coastal people of New Guinea, perhaps with a considerable Polynesian (?) element in them. They are noted ship-builders and traders. Finsch (1914, p. 477) says that they carry cargoes of pottery to Moeve Harbor, 200 kilometers distant across the open sea. The influence of the Tami-Siassi-Umboi group extends along the north coast of New Britain as far as Willaumez Peninsula and along the south coast to Moeve Harbor.

The structure and especially the decoration of the two-masted canoes of the Tami Islanders are essentially similar to those of the Siassi Islanders (p. 155). They are well illustrated by Neuhauss, who gives an explanation of various decorative motives and a photograph of one of the Bukaua, which is of the Tami type (1911, vol. 1, pp. 359-365, figs. 257, 259-264). A painted crescentic canoe ornament and also two paddles are figured by Schnee (1920, vol. 3, pl. 181, figs. 5, 7, 12). One paddle has a crutch handle, which seems unusual. Vogel (1911, pp. 173, 178) gives a drawing of a two-masted canoe under sail and of the decoration of the washstrakes and of various motives. Decorative details are also given by Preuss (1897, pp. 108, 136). Schellong (1904, p. 176) made the following observations in 1886-88:

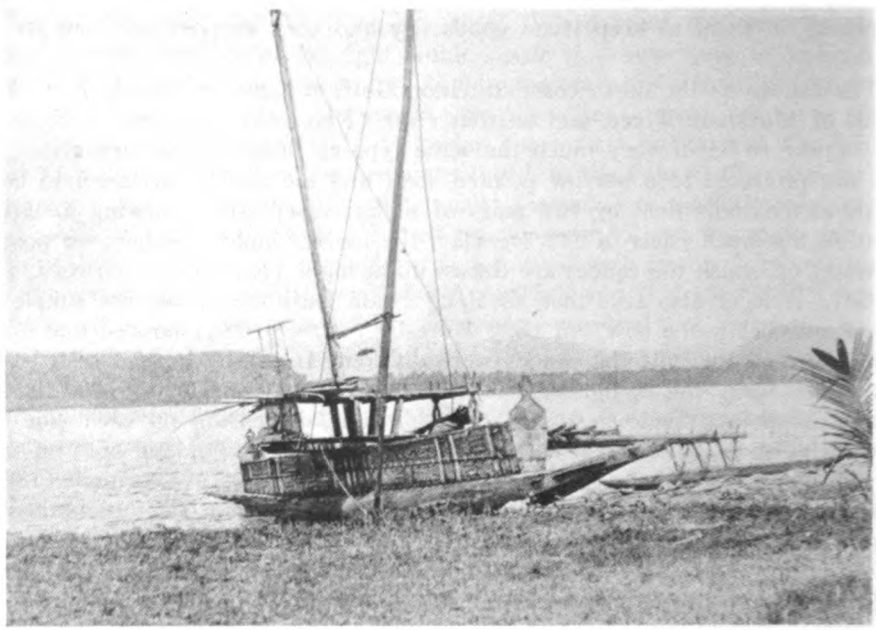


FIGURE 167.—Two-masted sailing canoe, Tami Islands (photograph by E. W. P. Chinnery).

> The best boats are those of the Tami Islanders, swift and steady even in fairly rough water. By simple shifting of both sails the canoe can sail either way. The sailing and paddling canoes of the coast villages (Jabim) are of the same structure, but less well equipped. A boarded platform with space for four persons and usually a fireplace is briefly noted. On the completion of a canoe, neighbors are invited to festivities. A feast also accompanies the making of a sail. The sail is constructed of strips of pandanus (*me*), as are the sleeping mats, and is bound by a cord of *ka nauli* bark that must be of one piece and longer than the periphery of the rectangular sail.

A two-masted sailing canoe from Tami Islands (figs. 167, 168) shows the same construction as that described by Sherwin for the Siassi canoes except that

there are only two stanchions (*awz auzeng*), which are on the outrigger side and help to support the upper platform; they do not project higher to carry a rail. On the off side of the lower platform a vertical framework supports that end of the upper platform and extends a long way above it; the lower part between the platforms is boarded over. A model in the Köln Museum is precisely similar, save for a hole to serve as a window in the boarded part of the vertical framework, a feature which is prevalent in this type of canoe from various localities.

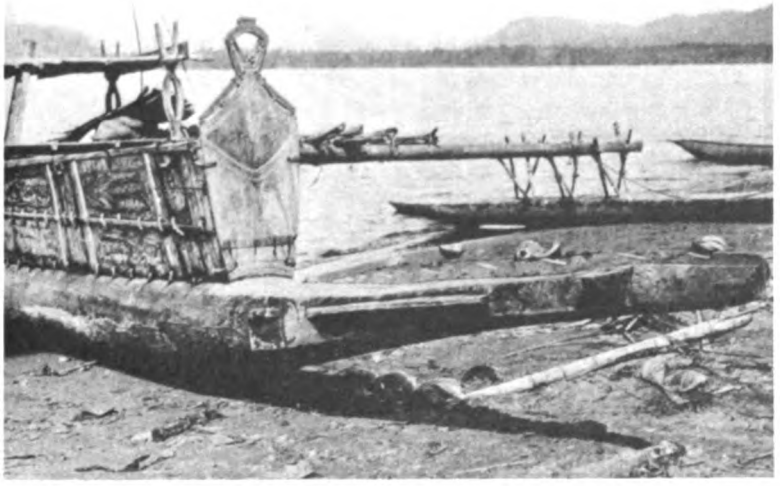


FIGURE 168.—Fore end of two-masted sailing canoe, Tami Islands (photograph by E. W. P. Chinnery, 1926).

HUON PENINSULA

FINSCH HARBOR

The dugout paddling canoe and the sailing canoe of Finsch Harbor have much the same structure, but the sailing canoe is larger:

The paddling canoe, according to a photograph (fig. 169), has very elongated ends that stretch horizontally over the water; the hollowed-out portion has a washstrake on each side and high, slightly carved breakwaters. A short, low, additional strake is sewn on in the middle of each side; on this the two long, straight booms are lashed and project well beyond the off side of the hull. The float is moderately long with raked ends. The two pairs of undercrossed connectives for each boom are slightly divergent. The boarded platform extends well over each side of the hull; its outrigger end is occupied by an open box or tray and at the end of the off side are two vertical sticks with a cross stick above; there is a vertical board across the lower part of this erection. The canoes are carved and painted in the manner typical of the area. Preuss (1897) gives numerous examples of the details of decoration.

The upper ends of the breakwaters of a highly decorated sailing canoe (fig. 170) have a perforated carving, as the smaller canoes may have. The vertical board on the off side of the platform has an elaborate pierced carving. At the head of the single mast is a lashed-on prong, as in the Siassi canoes, over which is rove the halyard, which is fastened to the yard at less than a quarter of its length. This end of the yard is steadied by a vang to which another is tied a long way down; the two ends are made fast, apparently to the float. The rectangular mat sail is nearly square. Two sheets are tied to the boom; one is double and the other has an additional line as in the yard rope. The two stays are rove through the hole at the end of the prong and are fastened to the platform.

Two models of two-masted sailing canoes in the Köln Museum from "Finschhafen", with their three booms and double-decked platform, are of the same construction as another from "Tami Inseln" and agree with Chinnery's photographs of a Tami Islands sailing canoe. Chinnery (1927, vol. 1, p. 31) says that the influence of Tami and Siassi is seen in the Finsch Harbor canoes, many of

FIGURE 169.—Paddling canoe, Finsch Harbor (photograph by Dr. P. de Rautenfeld, 1925).

which are purchased from Tami. The sides and platform of one especially good vessel, which had recently been bought, were richly decorated with incised drawings and carvings in which were represented pigs' tusks, fish tails, stars, frogs, birds, birds' wings, a crocodile holding a fish in its mouth, ghosts (*balum*), and other motives. The paddles, too, were beautifully decorated.

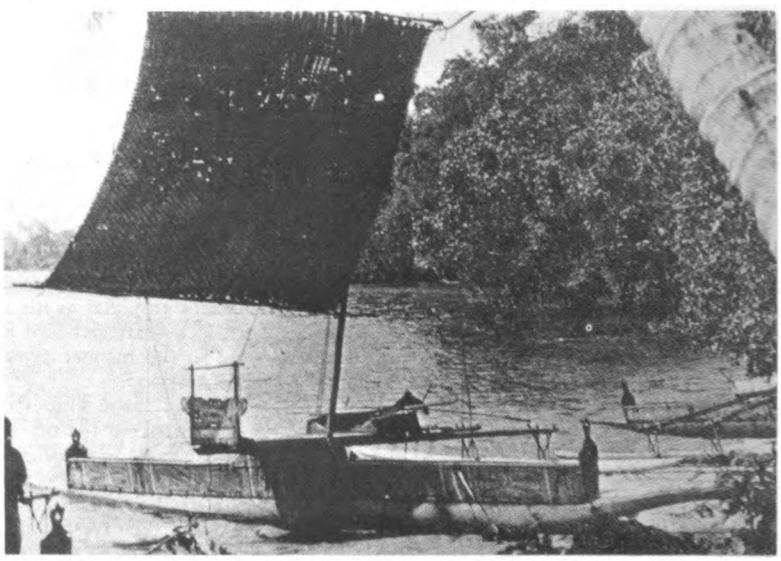


FIGURE 170.—One-masted sailing canoe, Kumloa village, Finsch Harbor (photograph by E. W. P. Chinnery; see Chinnery, 1927, pl. 14).

A large photograph of a model of a one-masted, two-boomed painted canoe made by a Jabim native of Simbang is given by Semayer (1901, pl. 5; plan, fig. 36), who gives the following terms: canoe, *uang* or *uan* (*wan*); the largest canoe, *uang la*; dugout, *uanganu*; float, *schap*; booms, *kioh*; connectives, *matu*. The boarded platform extends beyond both sides of the hull and on the off side is a vertical board, the upper corners of which are carved into a bird's head; at the outrigger end is a railing (*jakanu*) in front of which is an open box crossed by a board or seat (*jaun*). The mast (*jamo*) carries a sail (*rer*) that is rolled up so no details can be seen. The yard is called *ah*; the boom, *aschanga;* rigging, *lepo*; paddles, *ih*. The photograph of a model of a two-masted, three-boomed Jabim canoe given by Werner (1911, fig. 42) conforms entirely to the Tami type.

Finsch (1888-a, p. 180) says many of the canoes (*uang*) of Finsch Harbor were very large, 60 to 70 feet long, and that some had three strakes, two platforms one over the other, and two masts. They were made (1884-85) with stone tools. Probably these were canoes from Tami Islands. The dugout of one canoe (Finsch, 1891, p. 53) was 50 feet long and 2.5 feet broad and high, the masts (*jamo*) about 20 feet high. The canoes were always leaky and needed constant bailing. From Huon Gulf to Astrolabe Bay wooden bailers of practical form were in general use, many of them beautifully carved. Finsch omits details of their form.

Along the coast of raised beaches or "terraces" between Finsch Harbor and Teliata (140° 24′ E.), according to Krieger (1889, p. 160), canoes are either absent or very poor.

Sialum

The islet of Sialum south of Cape King William (6° 6′ S.) is separated from the mainland by a narrow strait, one end of which is blocked by a sand bank. The natives cross this calm water to their gardens on the mainland in frail craft which suffice for their immediate needs. These simple and probably unique log canoes (fig. 171, *a*) resemble the legendary primitive canoes of Torres Straits; the Sialum people, however, are acquainted with proper outrigger canoes and I suspect that their craft is not really primitive but rather a degenerate form adopted by this impoverished people who speak a Papuan language. Neuhauss (1911, vol. 1, p. 347, figs. 32, 248, 249) refers to the Sialum canoe:

> The hull consists of a solid log of driftwood, the ends of which are roughly sharpened. It supports a framework consisting of two longitudinal rails raised on eight vertical sticks, one pair near each end of the hull and two pairs in the middle; there may be a cross stick or lashing for the outer pairs of sticks. Lashed to the central sticks and resting on the rails are two long, straight booms that extend a short distance on the off side. The small float is shaped like the hull and is attached to each boom by two pairs of undercrossed connectives. A slight platform of transverse sticks rests on the rails between the booms.

ASTROLABE BAY

Except when otherwise indicated, the following account is taken from Semayer (1901, pp. 72-80), all the local information he supplies having been extracted from Biro's notes. The first native name given below is in the Bogadjim dialect, and the second in the Bongu; when only one is given it is common to both; he gives a long list of nautical terms. These two villages, which are not far apart, are in the southwest corner of the bay, and it is in this limited area that Papuan languages are spoken; elsewhere the languages are Melanesian. At the south of the bay are Constantine Harbor and Bongu village. Bilibili Island lies in about

latitude 5° 19′ S. and Madang (Friedrich-Wilhelmshafen) at about 5° 13′ S. North of Madang is a chain of small islands: Biliao, Ragetta, Siar, and others.

The coast natives of Astrolabe Bay are little-versed in ship-building and navigation, but the special terms for the smallest parts of the canoes attest their ancient origin; probably in former times the vessels were more developed than now. The natives of Bilibili and Thiar [Siar, and probably other islands off Madang Harbor] form an exception as they have a great number of canoes in their harbors, whereas the coast villages of the mainland have only a few derelict sort of craft.

The craft of Tamol [in Astrolabe Bay the coast natives call themselves *Tamo*, men (Neuhauss, 1911, vol. 1, p. 27); Biro terms them *Tamol*] consist of: 1, simple dugouts 5 to 6 meters (16 to 20 feet) long, which easily capsize but are soon righted and bailed out; they are usually undecorated, but occasionally the end of the bow is carved; 2, outrigger canoes. Finsch (1888-a, p. 64) says that the natives of Constantine Harbor, near Bongu, are less versed in navigation than is usual with coast peoples and have only small canoes which consist of a dugout with one float and two thin booms. A strake is fastened onto each side of some dugouts, which necessitates a breakwater at bow and stern, which is sometimes decorated with perforated carving. In the Atlas (1888-b, p. 27) Finsch gives the measurements of a dugout as about 20 feet long and 2 feet deep. This he figures (pl. 5, fig. 1) as a simple dugout with carved ends; two long booms amidships support a platform of transverse poles that extends well beyond each side of the hull; a carved breakwater is also shown (1888-b, pl. 5, fig. 7). Stephan (1907, fig. 52) gives a photograph of a painted canoe at Biliao Island, Madang, which has a washstrake that extends nearly to the end of the hull. The breakwater is much higher than the strakes; its narrower upward prolongation is carved and perforated and bends outward (fore and aft), and the extreme end may be slightly recurved (fig. 171, *b*, 1, 2). Four examples are given by Semayer (1901, fig. 38), they are painted red and white. This type of breakwater appears to be characteristic of Astrolabe Bay. The two booms are in the center of the canoe; across them are laid longitudinal poles and over these transverse slats; this platform has a narrow board fore and aft and a wider one laterally. Of similar type is the canoe at Biliao figured by Neuhauss (1911, vol. 1, fig. 256). The float is nearly as long as the hull. The fore breakwater curves forward but the aft breakwater is vertical (as in fig. 171, *c*, 1); this distinction does not appear to be universal.

Semayer (mainly on the authority of Biro) says (1901, p. 73) that the sailing canoes vary little in construction from one region to another; but there is greater variation in the decoration:

> The sailing canoes of the Astrolabe Bay district, like other objects, are mainly unornamented, while those of the southeastern districts, which are often met with in the Astrolabe district, are usually much decorated. A platform is rarely absent, the vertical boards of which and the sides of the canoe are painted in gay colors. Even the sails are adorned with cassowary feathers or carvings [this doubtless refers to the mast, spars, and rigging]; *Nautilus* shells are fastened to the top of the mast. The streamers on masts and rigging are not only ornamental but indicate the strength and direction of the wind.

When becalmed the natives summon wind by whistling or blowing on conches, like European sailors. Anchors are nowhere used in Astrolabe Bay. Branches weighted with stones (*njangir*) are made only for sinking fish traps.

Though Finsch (1891, p. 53) says that sailing canoes are of the same type from Huon Gulf to Karkar (Dampier Island, 146° E.), I think it safer to

base the following description mainly on photographs in Wegener (1903, figs. 77, 82, 90), the photograph of a canoe at Madang given by Weule (1912, pl. 76, I), the frontispiece in Ethnologica, vol. 2, 1913, and the data given by Semayer (1901). I shall refer to these by the letters: Wg, Wl, E, and S.

A canoe is called *ghobun*. The hull is a dugout with long horizontal pointed solid ends which are flattened above. The two painted washstrakes on each side (*ghobun-ghabau*, *ghobun-khabau*, and *raua*) and the decorated breakwaters (*dedema*, *ssaura*) are fastened on by bast and rattan cords and calked with shavings dipped in resin. There is a lath over the seam between the two strakes and a gunwale pole is lashed over the upper strake. The breakwaters are very

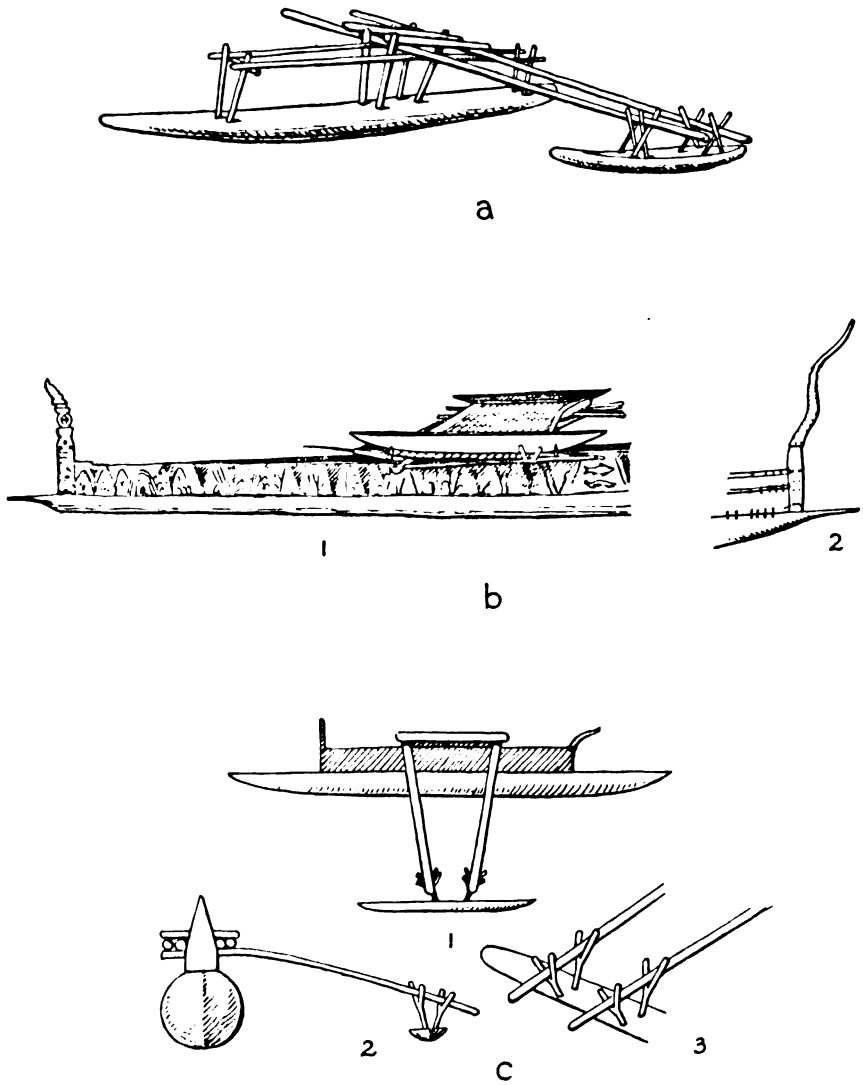


FIGURE 171.—Canoes, Territory of New Guinea. *a*, rude outrigger canoe, Sialum (after Neuhaus, 1911, fig. 248). *b*, hull (*ghobun*), Astrolabe Bay: 1, part of a *ghobun* at Biliao (after Stephan, 1907, fig. 52); 2, end of a *ghobun* with a tall sinuous breakwater (after Wegener, 1903, fig. 82). *c*, paddling canoe with crutch or Y connectives (sketches by E. W. P. Chinnery).

high and sinuous (fig. 171, *b*, 2); the upper part is carved in fretwork (E; S, fig. 38; Hagen, 1899, pl. 33).

The outrigger consists of two, or sometimes three (S, p. 72), booms (*kindja, kiandja*) about 4 meters long; they lie rather close together amidships and rest on the topstrakes; their slight curve is due to their length. Wegener (1903, fig. 77) gives a photograph of a large Bilibili sailing canoe at Bogadjim, one end of which appears to be very much like that of a European boat, but the other is typical. There are two outrigger booms amidships and a third halfway between them and the non-typical end of the hull to which the stays are fixed; the float extends a long way beyond the other side of the central booms.

The usual attachment consists of two pairs of undercrossed sticks (*ssamangha-meli, batulo*). Chinnery sent me sketches (fig. 171, *c*) of a small canoe at Siar which is quite typical except that he shows each attachment as consisting of two divergent Y sticks. He also gave me a photograph of a canoe that occurs at "Siar, Ragetta, Madang", which also is typical but shows the same attachment. The attachments of the *Bilibili* canoe just referred to are rather indistinct but they appear to be Y connectives. In all the above, the booms rest within the fork of the Y sticks, and for this reason they may be termed crutch connectives. So far as I am aware, Y connectives do not occur elsewhere in New Guinea, and their presence in Astrolabe Bay points to a special cultural drift. The float (*ssamang, ssaman*) is usually long and pointed at each end.

The platform (*djar, balage*) (in Wg, Wl, and E) consists of longitudinal poles laid across the booms; it extends for a short distance on the off side but much farther on the outrigger side. On the lateral ends are erected high poles, two on the off side and sometimes three on the outrigger side, which may be steadied by cross poles; but the arrangement is not constant. The lower half of the railing on the off side is boarded, and the outer surface of the boards is decorated. Resting on this boarding and extending completely over the lower platform is a second platform, the lateral ends of which may be covered in by a palm-leaf screen; and over all a palm-leaf roof may be constructed in a two-masted canoe (E). The upper platform is supported by supplementary posts; it does not appear to be a continuous platform, but at each end there is a boarded portion with low side walls forming a shallow box or tray. The fore and aft boards of the tray are produced into long narrow pointed projections beyond the platform (Wg, 1903, fig. 82) and may be furnished at the ends with a carving of a bird (E). The photograph in Ethnologica shows a light lattice screen at the fore end between the two platforms. In a plan of a sailing canoe with one mast (S, fig. 36) the platform consists of two transverse boards, (*djar, balage*) with a railing (*gegel, atano*) on the off side; outboard on the booms is a shallow box (*meligi*) across the outer end of which is a seat (*djar*); beyond this is a railing (*atata, ssamana gambor tut*).

In the smaller sailing canoes there is a single mast (*parra, ra-rengal*) which is stepped in the hull between the platform and a thwart (seat) (*aubandjer, baul*) (S, fig. 36). In the largest canoes there are two divergent masts amidships. The masts are steadied by stays and Semayer also gives names for shrouds. At the head of the mast is an attached prong (*rer-gir, papah*) for the halyard; beyond this is a thin added spar which is ornamented with bunches of feathers (?) or fibers (?) and surmounted by a carved bird or *Nautilus* shell. The rectangular sail (*rer, rar*) is made of plaited palm leaves, of *gerenga*, or sometimes of *dubuschen* leaves. The halyard (*dogam*) is tied to the yard (*rer-ghameli, tschujnam*) about a third or a quarter from one end, and a line passes from this end to trim the sail. The boom (*rer-ghameli, budjera*) has a forked end (*rer-gala, budjera-papaj*) to embrace the mast; two sheets (*langa-tschil, kelangale*) are fastened together at its center. One photograph (Wg, fig. 77) shows canoes at Bilibili with a single sail, but the photograph is not very clear. A small Siar canoe (Wg, fig. 90) has a washstrake and breakwater, and the same photograph shows part of a large sailing canoe with crude painting on the boarded screen of the platform.

The best canoes seen by Finsch (1888-a, pp. 83-85) were at Bilibili, which is the center of a flourishing pottery industry, the canoes being largely employed in this trade:

> The canoes are from 20 to 30 feet long; each end of the hull is produced into a long point flattened above, to which *Ovulum* shells are fastened. Many canoes have two washstrakes on each side which are frequently painted with representations of fishes, turtles, and birds. He represents (1888-a, p. 84) the breakwater as having fastened to it in front a curved forwardly projecting spur to which tassels are attached. The two booms are curved and each is connected to the rather weak float (about 14 feet long) by two pairs of undercrossed sticks. Amidships

on the booms is a platform on which is erected a kind of cabin resembling a large cage in which merchandise (pottery), provisions, and weapons are stored; a potsherd with glowing charcoal on a layer of sand is carried on the platform. The roof forms a second platform and has lateral railings. There is a mast, or sometimes two, with a huge quadrangular mat sail. The end of the mast is often adorned with a roughly carved wooden bird or a ruddled *Nautilus* shell which Krieger (1899, p. 159) says are painted in red stripes; but they have no other decoration.

The Bilibili natives are not great sailors. They may go as far as Karkar (Dampier Island), a distance of 40 miles, and never go out of sight of land; nor do they put to sea in rough weather—but on the whole the sea here is calm. The Bilibili canoes of a smaller build are exactly like those at Bongu. Finsch describes the anchor as a piece of tree trunk, the partially cut-off branches of which form hooks; it is weighted with one large or several small stones which are bound on with rattan, and a strong rattan serves as a cable, but Biro says this is a sinker for a fishtrap.

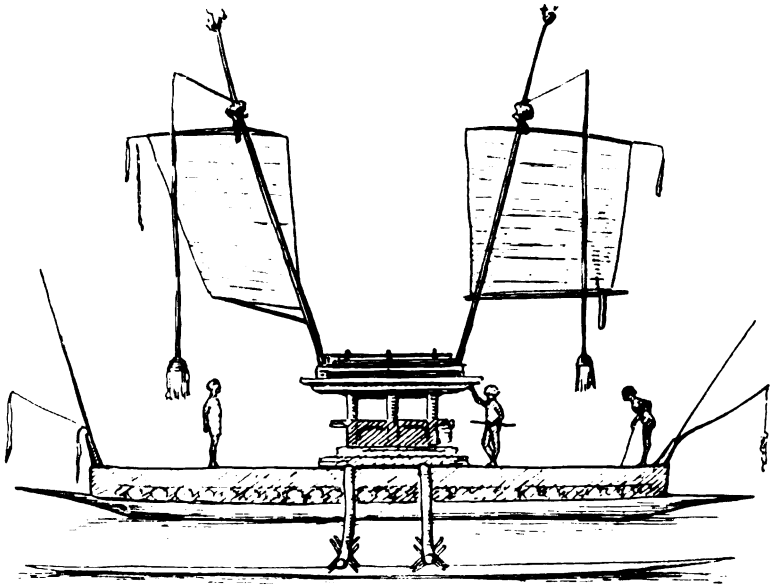


FIGURE 172.—Two-masted canoe, Ragetta, Astrolabe Bay (after Neuhauss, 1911, fig. 258).

A two-masted canoe from Ragetta (Graget) in the same neighborhood is figured by Neuhauss (1911, vol. 1, fig. 258). Each mast carries a small square sail, and they diverge fore and aft from the two-storied platform. There are two booms, and the float is as long as the hull (fig. 172). The photograph is on too small a scale to give details of the rig. So far as I am aware, no one has described the rig of these canoes in sufficient detail. Hagen (1899, p. 218) alludes to but does not describe the canoes of Astrolabe Bay. He gives a good photograph (1899, pl. 33) of one at Bilibili with a single mast and mat sail; it has a long sinuous fretwork breakwater. He also illustrates part of a smaller canoe at Bogadjim (1899, pl. 9).

There are three sizes of paddles (*oijoh, kulumna*) for men, women, and children, besides the steering paddle (*ulamo djara, kulumna djoga*) which are large and rough. The grips of the paddles (Semayer, 1901, fig. 37) have the grip

carved and often pierced, or as in some steering paddles, with a human head, but there is no crutch. Often the shaft is, as it were, prolonged onto the blade as a bead which terminates as a fish's tail. The Tamol carver regards the grip as the head of a fish (*ghe, ghajb*) and the shaft as its body, but a whole fish may be represented on the blade. The blade of the men's paddles is an elongated oval; the children's are similar but smaller; the women's paddles are evidently undecorated and the blade is a shorter oval. Krieger (1899, p. 159) describes the paddles at Bilibili as often artistically carved at the base of the blade or at the grip with a figure in relief of a man, bird, crocodile, lizard, or fish. Finsch (1888-b, pl. 6, fig. 8) illustrates a Bongu paddle with a fretwork grip.

CAPE CROISILLES TO CAPE DELLA TORRE

With the exception of the following I have not been able to find any information about the canoes of the coastal mainland from Cape Croisilles, longitude 145° 50′ E., north of Astrolabe Bay to Girgir, Cape della Torre, just north of the mouth of the Sepik.

Finsch (1888-a, p. 292) gives an illustration of the fore part of a canoe at Venus Point (just east of the mouth of the Ramu) in which the flattened bow prolongation is carved and has on its upper surface a crocodile carved in relief, the tail of which passes into the head of a hornbill. He gives a rough sketch (1888-b, pl. 7, fig. 5) of another carving which, he says (1888-a, p. 294; 1888-b, p. 27), represents a crocodile's head combined with a human face with a pierced nose and the eye surrounded by a ring of mother-of-pearl. He adds that the canoes are dugouts, 20 to 30 feet long, and in construction like those of Astrolabe Bay; some carry 18 men. He does not mention outriggers, and his illustration looks very like the outriggerless canoes of the Sepik; but the Astrolabe Bay canoes to which he compares them have outriggers, as must those whose masts he sketches. His Plate 8, fig. 3 illustrates the "ornamentation of the point of a mast from Venus-Point, composed of tapa and bast fibres, at the tip a kind of cross; fig. 4 the same representing a man-of-war's hawk [frigate bird] made of feathers, from the same place" (1888-b, p. 28).

Dr. Speiser gave me a photograph of a one-masted canoe at Kaka (Kerker), at the mouth of the Sepik:

The hull is produced to a beak with a flattened upper surface; the narrow carved wash-strakes have low breakwaters. There are four long, strong booms, the central being nearer to each other than to the outer booms. A narrow platform of thin poles extends over all the booms close to the hull and is provided with a low railing or fencing. The main platform is a narrow transverse structure over the two central booms; it rests on the hull and slopes gently upward and outward; the sides are boarded; over the ends of the side boards is a small second platform, or seat, of sticks, with a back-rest.

It is not possible to make out the details of the construction of the canoe, nor are the attachments shown. It may have been on a trading voyage from the Le Maire Islands, as it is very like the canoe photographed by Neuhauss (1911, vol. 1, fig. 253) of which a description is given in the "Dallmann harbor district." Concerning this canoe Neuhauss says: "Canoe from the vicinity of Berlin harbor, driven by the wind and sea to the Tami River on the German-Dutch frontier."

DALLMANN HARBOR DISTRICT

The Hansemann coast extends from Girgir, Cape della Torre, to Dallmann Harbor and its islands, inclusive; and the Le Maire Islands (Schouten Islands) belong to the same general district, which may be said to extend from about longitude 143° 30′ to 144° 30′ E. The eastern half of the coast is sparsely inhabited.

Finsch (1888-b, p. 28, pl. 8, figs. 7, 5) gives rough sketches of a single-masted canoe with an oblong sail from between Girgir and Hammacher River; the sail is about 10 feet long and made of plaited matting.

Long, very narrow canoes with beautiful carving (as in Finsch, 1888-b, pl. 7, fig. 4) occur at Krauel Bay (Caprivi River), a few miles west of 144° E. Some have a mast and sail; the largest carried 12 men (Finsch, 1888-a, p. 303). Finsch (1914, p. 478) repeatedly met on the Hansemann coast, large craft with up to 16 men on board, and he noted the artistic skill of the carvings, especially of the crocodiles carved out of the solid at each end.

The Le Maire (Schouten) Islands lie off the coast between longitude 144° and 145° E. From west to east they are: Kairivu, Mushu, Wogeo (Vokeo, Roissy), Keul (Keule, Koil, Kweil, Deblois), Viei (Viai, Wei, Jacquinot), Blupblup (Rubrut, Ruprup, Garnot), Kadovar (Karuar, Keruar, Blosseville) and Bam (Bem, Lesson). The inhabitants speak a Melanesian language which is split up into a western and an eastern dialect. As the true Schouten Islands lie in Geelvink Bay, I agree with Friederici (1912, p. 251, footnote) that the islands under consideration had better be referred to under their alternative name.

According to Friederici (1912, p. 266), the canoes in the main are all of the same type but differ somewhat in detail. One from Kadovar was beautifully ornamented, while one from Blupblup was ruder. The canoes have no washstrakes or additional "Vor- und Achtersteven" (end-pieces) though in the seafaring canoes at Kadovar there is a plank under the platform; they strongly recall the canoes of New Hanover and the Admiralties. There is no difference between bow and stern, and they sail with either end foremost. There are usually two or three booms and occasionally four; they are closer together in the Admiralties than in the Le Maire Islands. The attachments consist of five, six, or more pairs of undercrossed sticks, which typically project high above the boom, as is characteristic of the connectives of the Admiralties. Many floats have a crocodile head carved at each end, otherwise they have the form of those of the Admiralties. Some floats in Wogeo are provided with two handles cut out of the solid timber (Friederici, 1912, fig. 69), which are useful when hauling up or launching a canoe. A large Keul canoe measured 7.33 meters (24 feet). The platform has usually three seats and a back rail; in the large canoes it consists of two stages, the under one, being low, is used for paddles, poles, pots, and food. The quadrangular sail is made of the leaf sheaths of young coconut palms (Friederici, 1912, pl. 3, fig. 27). There are a yard and a boom, and the rigging appears to be of the usual type. The outrigger is on the starboard side. The islanders are in friendly trade relations with the natives of the opposite coast of the mainland at Kaip in the Cape Dallmann (Tarabu) district, where there is the same type of canoe. The people at Kaip speak a Papuan language akin to that of Dallmann Harbor district. In both areas Malayo-Polynesian linguistic influence is manifest (Friederici, 1912, p. 268).

Hogbin (1935) describes the trading expeditions from Wogeo and gives the spells sung during the processes of making a canoe, but does not give details of the structure of a canoe, though he says that a washstrake is attached only to the large canoes, the float has a crocodile's head carved at each end, and the extremities of the booms are in many canoes fashioned into a snake's head. His plates 2, 3, 4 show that in some canoes a carved looped pattern runs along the upper sides of the hull and that a head is carved at the ends of the hull. The sail is of elongated oblong shape, narrower at the yard than at the boom; it "is made from the fibrous sheathes of coconut leaves sewn together."

The following are some of the terms given by Friederici (1912, pp. 267-8):

	Wogeo	Keul	Kaip
Canoe	kat	kat	kiata
Boom	kiayo	kiait	koyuche
Float	vama	saman	om
Connectives	ʃdarame ɮgaram	garam	baire
Strake	niafa	.....	nanon
Mast	lanolano	.....	.....
Sail	yebe	.....	.....
Paddles	vora	vor	vueye
Bailer (coconut)	seme	(leaf) nim	.....

Friederici (1912, p. 264) says that on the coast and outlying islands, from the island of Muschu (Mushu) to the mainland village of Put (Buteim, 143° 10′ E.), the form of the outrigger canoe is mainly the same as that of Berlin Harbor; he did not note any characteristic differences. The dialect of Put, Dakur, and Kavu belongs to a Papuan language which is very unlike that of Valman (Kinagol to Vokau). The dialects of Kofi on the coast of Muschu, Tarawai, and Valis belong to another Papuan language, whereas the dialects of Juo (Yuo) [Guap] and Kairiru are different from these.

In Gauss Bay, Dallmann Harbor, according to Finsch (1888-a, p. 309), the canoes resemble those of Krauel Bay and have carved ends which are carefully protected from knocks; the carving on the bow of one represents a crocodile in high relief, the tail of which passes into a human head (Finsch, 1888-b, pl. 7, fig. 4). Tufts of bast and chains of plaited fiber adorn the mast. The sail, as elsewhere, is made of the clothlike leaf-sheath of the coconut palm.

Judging from a photograph (Meyer and Parkinson, 1894, pl. 39) taken at Cape Pomone, at the western end of Dallmann Harbor, the fair-sized canoes employed by women to transport garden produce are dugouts:

> A flat bead can be seen on the side at one end. There is a narrow washstrake, with a slat sewn over the seam. The two booms are close together. In the only attachment shown there are four pairs of undercrossed sticks. The platform is raised about 0.5 meter above the booms, on which it is supported by eight props (*alampanjip* of Berlin Harbor), four of which are above the gunwales and the others about 18 inches outside these, on the port and starboard sides respectively. The sides and ends of the platform are enclosed by carved and painted boards; the platform thus forms a narrow open box transverse to the long axis of the canoe.

On the neighboring islet of Guap, Finsch saw 37 canoes which were so narrow that the paddlers could not put their feet side by side in them. The raised and partly carved platform (Finsch, 1888-b, pl. 8, fig. 10) is, he says, quite like that of the Caprivi River canoe. They had an outrigger but he did not see any sail (1888-a, pp. 315, 319). Fortunately, Meyer and Parkinson (1894, pl. 44) give an excellent photograph of a Guap sailing canoe:

> The dugout slopes up gradually at each end and is prolonged into a horizontal beak which is carved to represent an animal's head with something in its mouth; it is ornamented with tufts of fiber or feathers. A slightly raised bead runs backward from each end for a distance of about 6 feet and a few inches from the strake. There is a single washstrake on each side which is nearly as long as the hull; the seam between it and the dugout is covered by a lath. The strakes are painted with various designs in white, red, and black. The breakwaters are not higher than the strakes; slanting obliquely upward and outward from each are two sticks partially bound around with feathers. It is not clear how many booms there are. The platform is raised slightly above the booms and strakes; it appears to have a low railing on the outrigger side; on the off side there is a higher framework that supports a crate. The single mast is amidships; there is a prong at its top, and above this a high elaborate emblem consisting of

carved birds, feathers, etc. The mast is steadied by two stays which are attached to the fore and aft breakwaters. The oblong mat sail is gaily painted with simple devices and has a yard and a boom. The halyard is fastened to the yard at about one fourth of its length and is rove over the prong; a vang is attached to the end of the yard. The boom slides on the mast by jaws, and a long tassel depends from its free end. The sheet consists of two ropes fastened to the middle of the boom and attached to the fore and aft ends of the platform.

A photograph in Wegener (1903, fig. 89) of a trading canoe at Guap agrees closely with the preceding canoe, so far as is shown. There are four booms, of which the two central are nearer to each other than the outer ones. Each attachment consists of four pairs of undercrossed sticks which lie close together, the crossing is low down and the sticks divaricate high above the boom. There is also a small canoe with two booms very close together, which carry a small transversely elongated platform standing on eight rather high supports, as in the Berlin Harbor canoes.

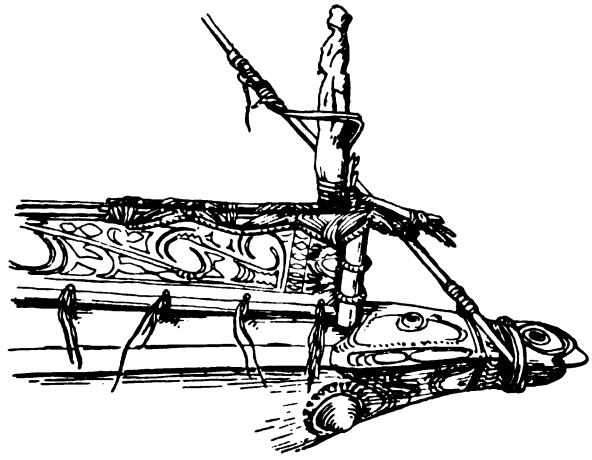


FIGURE 173.—Fore end of a one-masted canoe that had drifted to the mouth of the Tami River: a gunwale lath is laid over each washstrake and their ends are secured to the strake by elaborate lashing; three lashings are shown that bind the slat over the seam between the strake and the dugout. A short distance below is the long bead that runs from the middle line of the carved end of the dugout. The fore stay is made fast to the neck of the terminal animal's head and it is also lashed to the human figure (after Neuhauss, 1911, fig. 254).

A sailing canoe "from the neighborhood of Berlin Harbor" (Neuhauss, 1911, vol. 1, figs. 253-255) probably belongs to this district:

The dugout slopes up gradually fore and aft to richly carved prolonged ends, the terminal motive being an animal's head with something in its mouth, and at the base is a conical projection (fig. 173). From the carving a square bead runs along the side for some distance parallel to and a few inches below the upper edge of the dugout; it ends in a slightly raised triangular carving. There is a single washstrake on each side. These washstrakes are carved (?) and painted with designs representing birds' heads and interlocking coiled patterns very like a characteristic Massim design (fig. 173). A slat of wood covers the seam. The breakwaters are not higher than the strakes. To the bow breakwater is affixed what looks like a carved human figure, and at the stern is a pierced carving of two animals, etc. There are four very long, strong booms which lie rather close together. They rest on the strakes, and each is attached to the short, thick float by means of five or six pairs of undercrossed sticks, the ends of which project high above the boom. The platform rests on the booms; it extends for a short distance beyond each strake and is furnished with a low railing on the outrigger side only. Above this is a framework of a second platform with a narrow longitudinal crate along the off side.

Finsch (1888-a, p. 323) saw boys at Tagai, near Albrecht River [according to Parkinson (1900, p. 20) this name seems to be unknown locally—it is perhaps about longitude 142° 40′ E.] on rafts of midribs of palm leaves bound together. The raised sides were formed of two midribs and one midrib was used as a paddle; they were partially under water.

The canoes (Finsch, 1888-a, p. 324) were well-built craft of a curious new construction. Fore and aft of the strakes was an added piece which was often carved. [These are the end-pieces; one sketched (Finsch, 1888-b, pl. 7, fig. 3) shows a deep anterior notch in the top of the fore peak.] There were two very long booms which supported a platform, on each side of which was erected a high, narrow latticework crate which served as a seat and formed a good breastwork for fighting. [Finsch's diagram (1888-b, pl. 6, fig. 2) shows that these canoes were of the Berlin Harbor type.] Some canoes were very long (30 to 40 feet), carrying about 20 persons, of whom 14 were on the platform. Those with mast and sail seemed war canoes, as the lateral crates were full of weapons. Bailers were made of a portion of the petiole of a nipa palm, or a Triton shell was used, as also at Hatzfeldt Harbor, 145° 10′ E. (Finsch, 1891, p. 55).

BERLIN HARBOR DISTRICT

The Berlin Harbor district (now officially termed Aitape), according to Parkinson (1900, p. 20) begins about with the village called Tagai by Finsch and ends at Sia (Sera or Ser), which is just east of longitude 142° E. It includes the islands, from west to east, of Tumleo (Tamara), Ali, Seleo, and Angel. Farther east are the islands of Tendaye (Bertrand) and Walif (Guilbert), which Parkinson thinks also belong to this district. He says that the inhabitants of these islands are enterprising seamen who trade not only with the neighboring coast but also with Berlin Harbor in the west and Muschu Island in the east. On the whole, the western border of this district is much more sharply marked off from the next district than is the eastern border. Parkinson gives evidence to show that the whole of this coast has undoubtedly been visited by Malayan voyagers for a very long time. It is interesting to note that while all the islanders speak Melanesian languages, the mainlanders, as a rule, speak Papuan languages, the exceptions being Sia, Sissanu, Arup, Malol (Siau), Lalop (Paup), Jakomul (Tjam), and Volau (Ulau).

Friederici (1912, p. 262) states that from "Eitapé" eastward beyond Yakomul (Tjam), 142° 39′ E., the coastal craft are just like those of the islands; for the folk of Valman coast, including Paup and Yakomul (the two latter have very few outrigger canoes), get their canoes from the islands, especially from Ali and Angel. He saw canoes from these two islands at Vokau and Vrinagol (Kinagol) on the mainland in which the outrigger was on the port side. In discussing terminology (1912, p. 264) he says that the words form two distinct groups: 1, the Melanesian Angel, Ali, Paup, and Yakomul people, as also those of Tumleo and Seliu, with the *lepalepa*-form for canoe and *sema*-form for float; 2, the Valman (Vokau and Vrinagol) speaking a Papuan language with the *wangka*-form for canoe and *saman*-form for float and the genuine Indonesian *vesi* for paddle. These Papuans did not originally receive their outrigger canoes from the Melanesian Ali and Angel Islanders, from whom today they get their canoes, but from the Malayo-Polynesian wanderers or colonists, who did not make use of a derivitive of *lepalepa* but of *wangka* for an outrigger canoe, and not *sema* or *semasema* but *saman* for the float, and for paddle a form as in Makassar, *bise*; Bugi, *wise*; Sikka (Flores), *behe* or *wehe*; Bima, *wese*; Endeh, *wesah*.

The following account of the Aitape district is compiled from the excellent description given by Erdweg (1902, p. 363 ff.) with notes from Parkinson (1900) and Friederici (1912), who are referred to by their initial letters, and from various photographs, especially the beautiful ones of sailing boats at Ali by Parkinson (Meyer and Parkinson, 1894, pls. 45, 46):

Canoe-building is very highly developed in the whole district. Large sea-going craft for long trading voyages are found on the islands, as well as smaller canoes on the same plan; on the mainland long dugouts without an outrigger are used in the lagoons and rivers (P, p. 30). On Tumleo (E, p. 363) are found canoes (*lapil*) (P, p. 40) of very different sizes: from 5 to 6 meters long and 30 cm in diameter and holding at a pinch 8 persons, or up to 12 to 15 meters long and 78 to 80 cm wide and carrying from 1 to 2 tons. The wood is obtained from the mainland, as trees of sufficient size are rarely found on the island. When felled, the trunk is dragged along a cleared path covered transversely with thin smooth poles and towed across and hauled up the shore, where a shelter is erected over it to prevent its getting too dry. For hollowing it out a native ax is used, of which the blade can be set adzwise or axwise, or at varying angles to the handle, the European ax being quite unsuitable for this purpose. Numbers of transverse notches, 5 to 6 cm wide and deep, are made across the trunk at intervals of three fourths of a meter. Then between any two notches a longitudinal groove is hacked and deepened, another is made between two other notches, and so on till the whole canoe is roughly hollowed out. At about 50 cm fore and aft of the center a good piece of wood is left on each side projecting into the center to serve as a stiffening. The inside of the canoe is next chipped down to a thickness of 1.5 inches in a small canoe or 2 to 2.5 inches in a large one. An ax is mostly used for this purpose, but the more difficult parts are done with a gouge-adz, the blades of which are still made of stone, as the Europeans have not yet imported steel gouges. The trunk is next pointed at each end. Then after being allowed to dry for some time, the outside is charred uniformly by a small fire lighted along it, which makes the canoe capable of withstanding the damp.

Fore and aft V-shaped end-pieces (*tjepatjup*), which are kept in readiness, are added and then the washstrakes. The natives are always on the lookout for a piece of wood which is bent at a suitable angle to make an end-piece, and when found it is at once cut out and kept till needed.

The washstrakes are made of soft wood. The tree is split down the middle by means of an ax and then placed with the flat side on the ground; the (introduced) iron blade is shifted round so as to form an adz, and the rounded part is shaved off, leaving a rough and uneven board 1 to 1.5 inches thick. These boards and the end-pieces are charred to increase their resistance to decay. Where the boards meet one another, the edges are half cut through so as to form a rabbet-joint; they are lashed onto the upper edge of the hull and to each other by bog liana (*njuk*), which is very strong and about 0.5 cm thick. The strakes are higher amidships to support the platform and are notched for the booms. All joints and holes are calked with *yeim*. The bark of the *tjeim* tree is steeped in water in the hull of the canoe, then the sticky juice is scraped off from the inner side of the bark with a shell and mixed with charcoal obtained by burning the spongy inside of the stalk of the sago leaf. Thin slats of areca-palm wood are inserted under the lashings and over the seams, inside and out, and *tjeim* is rammed in with a chisel made of hard wood or bone; a stone is used as a hammer. Holes or flaws are repaired in the same way; the *tjeim* hardens in a few days. [The seams are calked with pounded kernels of the nuts of *Parinarium laurinum* (P, p. 31).]

Between the two pairs of stiffenings left amidships a frame (*rareu*) is inserted and lashed with *njuk*. These two *rareu* underlie the booms and serve to fasten the booms more securely to the hull and to prevent the sides of the hull from tumbling home; they often vary in form and give scope for artistic taste (F, p. 263, fig. 64, Vokau; fig. 67, Yakomul; fig. 68, Paup). The strakes are then tied together with plaitwork (*pangpang*) to prevent sagging. The booms are next placed in the notches in the higher parts of the strakes. Small canoes have two booms and the larger ones three; the middle one, however, may not be connected with the float but ends at a more or less central stringer. Friederici records this arrangement at Yakomul (F, fig. 66, *a*), but at Vrinagol he found that the central boom extended as far as the float and was lashed to a stringer that was tied over the attachments (F, fig. 66) but was not connected with the float. Erdweg distinctly states that there are three attachments when there are three booms. The thicker ends of the booms project 1/2 to 2/3 meter (1.5 to 2 meters, P, p. 31) on the off side, and on the other to several meters (4 to 5 meters, they are about 1.5 meters

apart, P, p. 31). In the larger craft there are one or two stringers across the middle of the booms. The float is made of light wood of about the length of the hull below the water line, it is pointed fore and aft and is charred. Each attachment consists of two pairs of undercrossed sticks; all the lashings are made with *njuk*.

A prominent feature of the large canoes is the raised central platform with a crate at each transverse end (fig. 174). In the largest canoes there are for each boom four supports (*alampanjip*) 1 to 1.5 meters high, two on one side of the hull and two on the other, but only one on each side in small canoes. These are ⊥-shaped branches of hard wood on which a piece of the main branch or stem is left, the base being securely lashed to the boom; they form the supports for the lateral crates. One or several sticks are fastened to the supports 9 inches to 1 foot above each boom and parallel to it, and these are supported by vertical props also securely lashed to the boom. Longitudinal sticks are fastened above these transverse sticks. The platform is finally covered with small laths of very hard areca wood (*papo*).

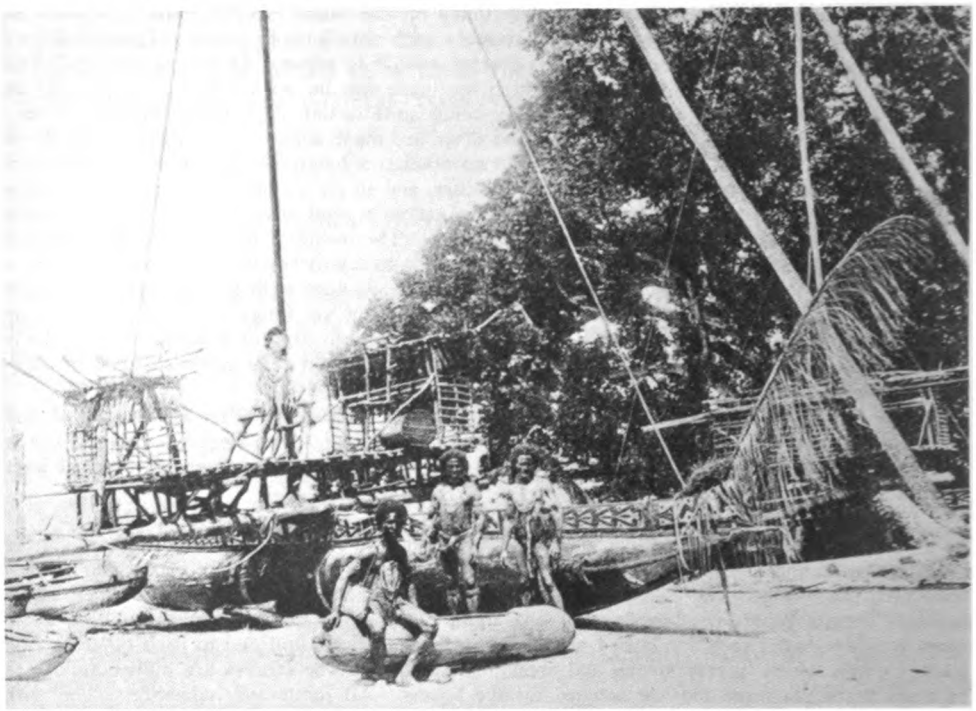


FIGURE 174.—One-masted canoe, Ali (from Meyer and Parkinson, 1894, vol. 1, pl. 45).

Everything is fastened with *njuk*. The upper ends of the supports are connected by a longitudinal stick; and in the fishing canoes at Tamara Island (fig. 175) and in Chinnery's photographs taken at Aitape, the outer supports are strengthened by two crossed braces, the lower ends of which are lashed to the booms and the upper to the supports or their longitudinal connecting sticks. In the smaller canoes the supports (*alampanjip*) form a light framework, but in the largest canoes an elaborate crate is erected in connection with them, and these and the platform with its additional strengthenings form a very impressive structure. In the smallest fishing canoes there is only a small simple platform.

The mast of the large canoes is a slender sapling, 8 to 9 meters high; the lower end is deeply notched to fit on the higher central part of the strake on the port (left) side, after passing through a hole in the platform. The mast is secured to an apparatus called *tjontjil*. This consists of two stout *alampanjip*, each of which is firmly lashed to a boom immediately beyond the starboard (outrigger) side; they pass through the platform slanting upward and outward (over the port side). Two crossbars are lashed, one on each side of these *alampanjip*. (Erdweg says about 1 foot from the platform and 1 foot from their ends, but figure 174 shows that these measurements are not constant. The mast passes between and is lashed

to these crossbars, where there are two of them, but occasionally it seems there may be only one. A carved upwardly inclining ⊥-piece or prong is lashed to the fore side near the end of the mast proper. To the top of the mast is fastened a vertical rod 1 to 1.5 meters long to which are attached carvings which generally represent fishes or birds and nearly always at the tip variously arranged pigeon or cassowary feathers (E, fig. 254). This emblem, which can be removed at pleasure, is different for each village-division (*anitjol*) and can be distinguished from afar. The mast is further steadied by a fore and an aft cane stay; the fore stay is fastened a foot higher than the aft and passes through a hole in the prong, and the halyard is rove within this triangle over the angle of the prong. The stays are attached to the ends of the craft.

The oblong sail may be 5 1/3 meters high by 1 1/2 meters wide, or 7 1/2 by 2 1/4 meters; there are a yard and boom and the long sides are strengthened by a rope. The sail is made of hundreds of pieces of the natural cloth that grows between the bases of the leaves of the coconut palm. The spars and ropes are laid in position on the ground. A strip is made, beginning at the boom and close to a lateral rope, the overlapping edges of the pieces are sewn together with areca-wood needles and bark thread and fastened to the boom, rope, and yard; other longitudinal strips are added till the lengthy task is finished. The sail is durable. The proximal end of the boom is forked or has a small forked piece added to work on the mast. The halyard is tied to the middle of the yard and passes over the prong, and the sail is fixed and trimmed by small ropes fastened at each end and in the middle of the spars; they pass the props of the platform to be fastened to the pegs below the booms. All the running rigging is made of the bast of a shrub and is twisted as in our ropes. When sailing, the outrigger must lie to windward and the sail to leeward. When not in use the sail is rolled around the boom and lies on the platform. Parkinson (p. 32) says the sail is generally made of strips of pandanus leaf sewn together. The yard and boom are adorned with bunches of feathers. It is not possible to tack in these large canoes, but only to run before the wind; with a contrary wind paddles are used.

These large canoes are the merchantmen of the district. They leave Tamara (Tumleo) laden with pots for the coast villages of the mainland and return with sago. From Ali they take marine fish and bring back vegetable food. They always carry a crew of 10 to 20 men, usually all the male members of a kin, who take this opportunity to visit their friends and relations.

Parkinson refers to the great number of dugouts without outriggers on the mainland for use on the rivers and lagoons, they range in length from 4 to 20 meters. They are not very stable and the paddlers squat on the bottom when the water is rough, while the women and children lie singly along the bottom. Both ends are generally decorated with a complicated carved design, and tassels of fiber are hung under the long projecting bow and stern; also a longitudinal ridge is left inside the canoe to strengthen the ends and is carefully carved. Parkinson (1900, p. 33) figures the ends of two Malol canoes.

There are three kinds of outrigger canoes:

1. The smallest, for at most five persons, are for fishing and are only paddled. Meyer and Parkinson (1900, pl. 14) show some women's fishing canoes at Seleo Island. The ends are bluntly pointed and are undecorated; there is a narrow washstrake along the whole length or a thin gunwale pole; there are no end-pieces or breakwaters, as the strakes meet at the ends. The outrigger apparatus is normal and there is a small simple platform resting on the booms.

2. Medium-sized canoes which carry 1,000 to 1,500 pounds of cargo and need four to five paddlers. They may have a small temporary sail for long distances. Several of these photographed at Tamara (Tumleo) Island (fig. 175) have a narrow washstrake and end-pieces which turn up to form a nearly vertical peak; the end-pieces and the strakes are plain, but the sides and the ends of the hull are carved. There is a stringer across the middle of the two straight booms. The float is long and thin. In addition to the two pairs of undercrossed sticks, an attachment may have an oblique stick that passes under the boom to give additional support. The platform is raised on *alampanjip* and similar props; the outer *alampanjip* project high above each end of the platform, and these are connected by a crossbar close to their ends;

there are also the typical cross ties. Photographs taken by Chinnery at Tamara and Aitape show precisely the same structures.

3. Large canoes, carrying up to 2 tons. These may go for a coasting voyage of 60 miles and are chiefly sailed (fig. 174). They are not used during the northwest monsoon (November to March), as the men can not sail against the wind and the paddling is too hard. The natives have a good knowledge of wind, sea, and weather. Erdweg (1902, pp. 370-371) gives details about sailing trips and methods of propulsion and steering; poles are always used when crossing a reef. A fire is always carried on the platform; the hearth consists of the opened-out petiole of an areca-palm leaf, which then measures 2 square feet; sand is strewn on it and on this a glowing log is placed. No anchors are used, as the ships are beached; numerous round wooden props are employed to support them on the shore. The larger canoes carry these props with them. In some canoes one end is carved to represent a crocodile or bird. The structure of these canoes has been described above.

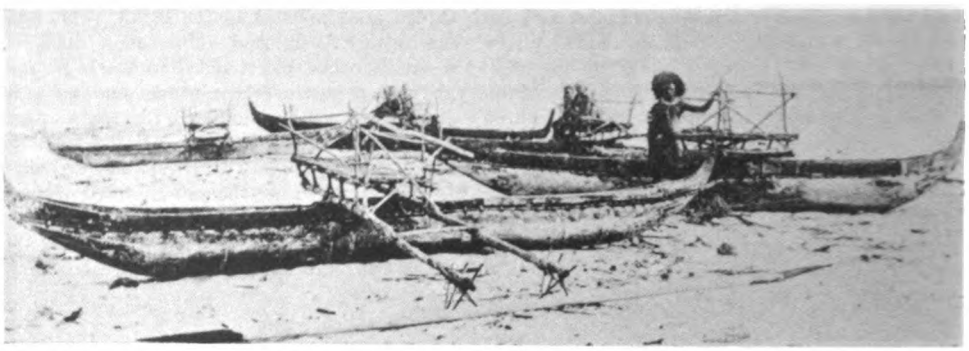


FIGURE 175.—Medium-sized canoes, Tamara Island (from Meyer and Parkinson, 1900, vol. 2, pl. 18).

A sailing outrigger canoe of Walman coast (Meyer and Parkinson, 1900, pl. 10; this is copied by Parkinson, 1900, p. 31, but it is not so clear) has a carved bead running backward from the ends along each side, as in the Guap canoe; in an Ali canoe (fig. 174) this bead ends in a crescentic carving. The high end-piece of this Ali canoe is covered by a long shredded coconut-palm leaf rising from an inflorescence of a palm. The transverse fore and aft supporting poles of the platform project some distance beyond it over the respective booms of the outrigger, and the end of each passes between the legs of a carved human figure that faces out and whose feet are lashed to the boom. A large three-sided lattice-work crate is erected at the narrow ends of the platform; that on the off side has an upper story. In the Walman canoe a long, tasseled, feather-bedecked rod rests on the rostrum and projects far beyond it. A flying fox (*Pteropus*) is represented on the washstrake.

Chinnery (1927, p. 48) gives an account of the canoes of Angiel (Angel) Island, including some canoe terms. The second terms given and those from Tamara are from Chinnery's manuscript:

> The canoe (*epil*) is a dugout with a washstrake (*fram, faram*) lashed to the hull from stem to stern, the bow and stern (*anisiwil*) turning upward. A box-shaped platform (*wara*) is lashed amidships, from which the outrigger booms (*wiwuit, wiuit*) reach out to the float (*sen, sem*), attached to them by five short hard wood pegs (*aviul, avuil*). The bailer (*thalea, chalea*) is of coconut leaf. Paddles are called *auis* and sails, of coconut fiber, *drung*. Along the top of the platform is a stick (*netru*) ornamented at the ends with carved birds' heads.
>
> Tamara terms are: canoe, *lapil;* strake, *chapago;* platform, *lapilala;* boom, *ai-ik;* float, *suam;* connectives, *awin;* bailer, *chala;* paddle, *was.*

Erdweg says that fishing canoes are hardly ever decorated, but that larger canoes, especially the great sailing ones, are very ornate. The dugout has raised patterns cut fore and aft, simple knobs in rows, or animal or human figures or human faces. The extreme ends may have a plaitwork of *njuk* or carved knobs and leaves on both sides. Many of the washstrakes are covered with simple designs regularly arranged and painted alternately in black, white, and red. The thick ends of the booms are commonly carved with snakes' heads, as are other sticks on the platform. Tufts and streamers adorn the sail and platform.

Erdweg (1902, figs. 255-257) gives illustrations of paddles. These have an elongated pointed oval blade which is covered with carving; the grip of the handle is also carved and the end may be plain or carved in simple bird form.

The launching of a canoe is attended with some ceremony, even for a fishing canoe. When the log for a large sailing canoe is hollowed out a small feast is made for the workers and friends. Coconuts are broken with an ax in the angles between the booms and the hull, and the fluid is poured into the hold. The ends and sides of the canoe are decorated with tufts and fringes; sometimes special human and bird figures, carved for the occasion, are fixed at the ends and on the platform, as are also the shells of the coconuts that were broken. All this is done, together with the burning of plants in the hold, to bring good luck to the ship. Then the ship is launched, and women and children take part. A trial trip is made with great noise and merriment, and the blowing of conches on board. A feast is held on the return; the older men feed in the *alol* place—the *alol* is the clubhouse of a division (*anitjol*) of a village—the younger generation and the women eat at home. Then all smoke and chew betel together (Erdweg, 1902, pp. 372-373).

WEST OF BERLIN HARBOR

Friederici (1912, p. 260) says that outrigger canoes are rarely seen on the coast from Malol to Nori, but that simple dugouts are common. Malol is at about 142° 13′ E.; Arup (Arop) is at 142° 9′ E. on the east side of the great Taweiiu or Norow Lagoon. Warupu is the submerged pile village at the western end of the lagoon. Sissanu (Sisano) is at 142° 3′ E., Sia (Ssera or Ser) is at 140° 59′ E., and Nori is about halfway between Sia and Leitere. The Malol, Arup, Sissanu, and Sia folk speak dialects of one Melanesian language which contains many Papuan elements.

The canoe seen by Friederici at Malol was bought at Ali and was naturally of the Ali type. There were three booms, each attached to the float by one pair of undercrossed sticks. The stem and stern supported a small addition like the *sara* addition of Geelvink Bay. Friederici says that the outrigger canoes of Nori and Sia seem to represent the original form of craft of the allied peoples from Malol to Sia. The use of outriggers among the other three tribes has been repressed by their navigation in sheltered water, or perhaps it had already entirely fallen into oblivion. The craft are characterized by a knoblike projection on the end-piece which he had not noticed elsewhere. There are only two booms which have the same attachment as the canoes of Ali. Between the two booms is a false boom which is not connected with the float; Friederici regards this as a degenerate representation of the middle boom at Ali. The canoe has a platform. The following description is taken from Friederici (1912, p. 260):

> The dugouts without outriggers are troughlike and clumsy, but spacious and more stable than those farther east in the Sepik district. There are no seats and the natives stand up to paddle or punt; they punt in the lagoon and paddle when traveling along the coast. There

is an elegant horizontal carved beak and ornamental carving on the sides. A large dugout at Arup measured: length 14.10 meters, breadth of opening 0.445 meter, greatest breadth in the middle of the swelling 0.79 meter, height 0.85 meter. The bottom is round, smooth, and without a keel. When the trunk has been hollowed out crossbars are temporarily inserted, as in the Archipelago, to prevent shrinkage.

Neuhauss (1911, vol. 1, fig. 26) gives a photograph of dugouts in the Sissanu Lagoon. They have square ends with a slight rake, the upper border of the ends is produced as a thin flat triangular board, the sides of which are slightly concave. There is neither washstrake nor outrigger.

At Massilia, which Neuhauss thinks may be Leitere, Finsch (1888-a, p. 332; 1888-b, p. 27, pl. 7, *1*) saw canoes that differed from those to the west in being without a fore added-piece or a raised platform. They were smaller than western craft and were characteristic of Massilia in having bound-on strakes and paintings on the sides, but (1888-b, p. 27) he says that the strakes and sides of the hull have burnt designs of fishes, porpoises, and he illustrates other designs. Some had a sail and on some a tuft of cassowary feathers adorned the masthead.

Friederici (1912, p. 259) says:

The pile village of Leitere has few sea boats. Troughlike dugouts without outriggers are used in the lagoon, as they are used throughout the north coast under similar conditions. The conditions at Leitere prevail from Wanimo to Eitape in the east. East of Eitape the lagoon character is less marked and the coast is protected by islands and banks. Here again seagoing boats are seen, built not by the coast people but by the Melanesians of the islands, especially Ali.

The Wanimo district extends from Leitere (141° 39′ E.) to Wutong (Wutung, 141°) at the Netherlands New Guinea boundary. Chinnery (1927, p. 51) says the same language is spoken throughout. Attack Harbor (Angriffshafen, 141° 17′ E.) is bounded on the east by Cape Concordia, on its western border is the village of Wanimo, and just beyond the village and to the west are Waremo and Yako.

According to Friederici (1912, p. 258) there are exceptionally good craft at Wanimo and in great number. He first met with this type of canoe at Leitere, which strongly reminded him of the canoes from the Lemusmus district of North New Ireland, the form of the hull being very similar. Following is the gist of his description:

Wharves occur not only along the shore but also in each great temple, which is a kind of assembly house for men. At Waremo five canoes were seen in process of manufacture. The washstrakes were first fixed on the edges of the dugouts and then worked. The outrigger is always on the starboard side and consists invariably of two booms, each attached to the float by two sticks [? a pair of undercrossed sticks, but Chinnery records two pairs of undercrossed sticks at Wanimo]. The booms always extend over the off side and are connected by a narrow, close latticework to a platform; on this side of every platform is a backrest, and on the outrigger side three spars project, the ends of which are carved into swordfish heads, which support the harpoons, fish spears, paddles, and other equipment. The canoes are strong and elegant and carry a long quadrangular pandanus mat sail with four to five bamboo cross spars. The fore added-piece recalls that of the outrigger canoes of the western Carolines.

Chinnery (1927, p. 51) says the same language is spoken from Leitere to Wutong. In describing the "Vanimo" [Wanimo] people, he says:

"The people of this group are intrepid fishermen; they sail their small canoes far out into the deep water and fish with nets and spears. . . The canoes (*pi*) are small dug-out vessels with an outrigger, and sail (a rectangular piece of matting almost as long as the canoe). To the hull is attached a removable prow [added fore-piece] (*pi-u*) carved to represent a suggestive combination of fishes and seabirds [fig. 176, *a*]. This prow is widely dis-

tributed along the coast of Hollandia [Humboldt Bay district]. A washstrake (*pi-re*) runs fore and aft. The hull itself is carved in the bow and in the stern. A platform (*pi-hu*) is fixed amidships to the wash-strake, and from this [the two] booms (*pi-da*) run towards the float (*pi-a*) and are lashed to it by means of four small hardwood pegs or attachment sticks (*pi-ru*). When sailing, the mast (*wa-ti*) leans at a slight angle towards the bow. It is supported by rigging (*wa-to*) and carries a relatively large mat sail (*wa*). A baler (*pi-i*) of coco-nut leaf [base of the leaf], in the form of a scoop [fig. 176, *e*], ornamental paddles (*pi-ni*) with snakes (*niapa*) carved in relief [fig. 176, *d*], and long poles (*atibo, agibo,* MS) rest in the bottom of the canoe."

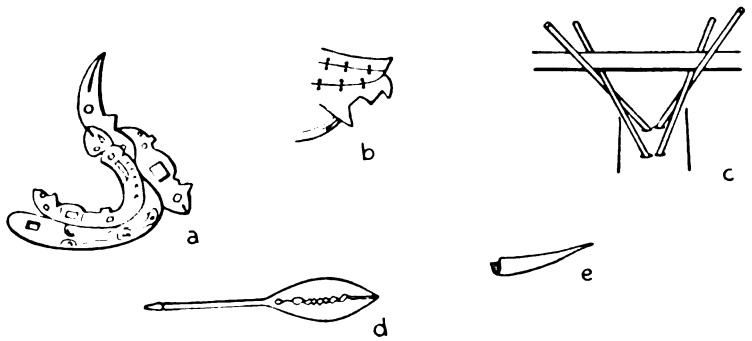


FIGURE 176.—Details of a canoe (*pi*), Wanimo: *a*, fore added-piece; *b*, bow showing two strakes; *c*, connectives; *d*, paddle; *e*, bailer (sketches by E. W. P. Chinnery).

A sketch by Chinnery (fig. 176, *b*) shows that the extreme end of the hull may be carved in a toothed manner. The washstrake runs from end to end and there is a second much shorter washstrake sewn on at the ends. There are two pairs of widely divergent undercrossed sticks at an attachment (fig. 176, *c*).

The first description of a canoe from Attack Harbor is that given by Paris (1841, pl. p. 105, figs. 7-9), who illustrates a narrow dugout that has only a slight rake:

> The sides in the plan taper to blunt ends and apparently the ends are solid for some distance; there are no strakes. The two booms are amidships and extend a short distance on the off side. The small slender float is at a great distance from the hull. Connectives are shown as two pairs of divergent sticks that overlap the boom. A latticework platform on the booms extends for about the same distance on each side of the hull; in an end view it is shown as propped on the booms on the off side and sloping down till its starboard edge reaches the booms. There is an indication of a carved ornament slanting up from the end which is evidently the bow.

Canoes seen in Attack Harbor by Finsch (1888-a, p. 336) were generally small craft carrying three to seven men; some had a mast and a sail made of the leaf-sheath of coconut palms. He says they are peculiar in having the washstrakes in one piece with the dugout and not tied on; he refers to his sketch (1888-b, pl. 7, fig. 2) which, however, is not conclusive. Van der Sande (1907, p. 199) says Parkinson (1900, p. 30), who also visited Attack Harbor, only speaks of boards "lashed-on." Van der Sande considers the figures on the strakes to be birds though Finsch (1888-b, pl. 7) regarded them as fishes. Besides the engraved decoration of the sides the stem and stern have attached to them a brightly painted and cleverly carved S-shaped addition [added-piece] which ends in a bird's head. This is described and figured by Finsch (1891, p. 54; 1888-c, pl. 22, fig. 4). It is the characteristic bow ornament of the canoes farther west. He states (p. 55) that while many canoes have this addition at both ends, all do not have it.

Weapons are supported on two sticks, often painted and delicately carved, which terminate inward in a hook and are inserted in the float; weapons are kept also in latticework crates on the opposite side of the platform. The platform of some canoes is ornamented with variously colored artistic carvings and plastic representations of fishes and birds. The masthead is often decorated with a tuft of cassowary feathers. The quandrangular sail is usually made of plaited pandanus leaf matting. Large canoes carry eight to ten men. Van der Sande (1907, p. 201) says that there are only two carved sticks which project from the platform to hold the rolled-up sail. Preuss (1899, pl. 5, fig. 18) illustrates the carving of a fish at the end of one of them.

There is no doubt, says Friederici (1912, p. 260), that the Wanimo man with his Papuan language has to travel in a Melanesian-Polynesian outrigger canoe, and the Sissano, Arop, or Malol man travels in a dugout like that of east Queensland, though the Queensland canoe is fitted with an outrigger.

NETHERLANDS NEW GUINEA

HUMBOLDT BAY DISTRICT

The Humboldt Bay district may be taken to extend from Oinâke and the Tami River to Tanah-Merah Bay inclusive. Some of the numerous villages at Humboldt Bay are Jotefa (Jotafa), Tobadi, and Kajo. West of the bay is the large lake of Sentani.

The following account of the canoes is based on Van der Sande (1907), who gives good references to earlier writers and is the latest Dutch author I have been able to consult, Van de Goes (1862), Friederici (1912), and Hornell (1923), though other authors have been consulted. I refer to the most-quoted authors by their initials. Published and unpublished photographs have also been inspected.

At the mouth of Sechstroh River (apparently the Tami), just within the Netherlands boundary, Finsch (1888-a, pp. 343-344) found the natives had no canoes but saw them paddling about on root-stumps of trees; to each side of the stump a stout bamboo was bound. However, Preuss (1899, pl. 5, figs. 9, 14; pl. 6, fig. 28) gives illustrations of canoe carvings which show that outrigger canoes of the Humboldt Bay type either belong or visit there.

In Humboldt Bay there are two kinds of craft: 1, the men's boats and 2, the women's boats, which are simple dugouts without outrigger; Van der Sande (1907, p. 206) says: "They correspond pretty well with those of Lake Sentani, and like these generally have no ornament whatever."

The boat for men (*wache, ware*, S; *waka, wage, waga*, F) is about 16 to 30 feet long (G). Each side of the dugout is raised by means of a washstrake (*brebare*, S; *perebare, parepare*, etc., F) which is sewn on. The space between the strakes is so narrow that the legs of the men can not be placed side by side, but the width within the dugout is large enough. There is little difference between the ends of the dugout, both are curved, though the stern is sometimes more vertical. The sides of the dugout are remarkably and uniformly thin (1.7 to 2.4 cm); in order to prevent them from bending in or out, two small transverse planks are inserted at the middle of the canoe. At Jotefa there are transverse struts, and below these two sticks that cross each other; the sticks are supported below on a thickening of the dugout which was left in its manufacture (F). Good joints are made by sharpening the edges of the dugout and making a corresponding groove on the lower border of the washstrakes; these are fastened at several places by strong lashings of a reddish-brown liana (*nâ, nâre, nâche*, S; *noge nok*, etc., F), a material which is much tougher than strips of rattan. The ends of the strakes, fore and aft, are usually connected by a handsome plaitwork of *nache*. For calking seam and holes "a kind of elderberry material, *sui*, is used." The wood of which these craft are made is light, easily worked, but not very durable, so that after a couple of years the boat becomes untrustworthy and is cut into planks.

The decoration of the hull is effected by painted carving; not by burning as Van der Goes states. The intaglio carvings are painted red and black and represent "birds called *marau*, which are often joined, or meet in threes and fours, with the heads at an ornament shaped as an angle, called *sirebah*, but otherwise unintelligible to me. The wings are called *pau*, the triangles behind the eyes, *gaijar*. Sometimes the entire surface of the hull is carved in this manner, but this, according to my experience, is not seen in Netherlands territory outside Humboldt Bay" (S, p. 109). De Clerq and Schmeltz (1893, p. 94, pl. 24, fig. 6) regard the designs on a toy canoe as fishes. Friederici admits that the point is disputed, but he is convinced they are flying fish.

Apparently end-pieces are not usual on Humboldt Bay canoes, and when they are present they seem to be derived or copied from those of the Arimoa Islands. Hornell (1923, pp. 71, 72, figs. 10, 11) writes of the canoes of a village on the west side of Humboldt Bay:

"The stern has no carved end; it terminates quite plainly. As for the fore end, the decoration is of two kinds; in the larger canoes it consists of an added piece tied on, carved to represent a curiously mixed group of fishes surmounted by a seated parrot; in the smaller ones the bird disappears being replaced by an object that may be a bird's head. . . Apart from this added prow ornament, the hull of the dugouts and the surface of the wash-strake are decorated with incised fish devices rendered in unmistakable Melanesian style, the fins elongated and elaborated to represent the pectorals of flying fishes. No two hulls are ornamented alike [1923, fig. 12]. . . . The red and black pigments used to outline the incised lines of the design are most effective upon the greyish-yellow background of the naked hull."

Characteristic of the Humboldt Bay canoes are the elaborately carved and painted fore added-pieces, or figureheads (*wache meti*) (fig. 177).

Van der Sande (1907, pp. 209-211, pl. 23, figs. 3, 4) describes several and figures two, and says that De Clerq and Schmeltz (1893, p. 93) are wrong in stating that the carving is placed in the stern; he did not see "a loose ornament tied onto both stem and stern, as illustrated by Finsch (1888-a, p. 358, though not on p. 352) of Humboldt Bay. . . . He [Finsch] may have seen this a little more eastward, in Berlin Harbour, although the object is here much less important and simply consists of knee-shaped, colored pieces of wood (Erdweg, 1902, p. 364, fig. 249)." Erdweg does not allude to ornaments tied on at either end, but Friederici (1912, fig. 58) illustrates a plain fore "Stevenfigur" from Wanimo of the same form as a *wache meti*, which he says resembles in its outline and spring the similar piece of the outrigger canoes of the western Carolines. Van der Sande (1907, p. 210, pl. 22, fig. 6) describes and figures a fore added-piece (*sori*) from Tanah-Merah; "it is uncoloured and carelessly finished, the proof that here the western limit of this style of prow is approached; nevertheless all the representations of animals can still be traced on it." An added-piece is shown on the bow of a small canoe at Humboldt Bay in Meyer and Parkinson (1909, pl. 3), another is unshipped and lies on the platform (pl. 4). The object is S-shaped (fig. 177), at the top is a cormorant's head, usually with a dog on its beak (Van der Sande discusses this animal), below on both back and front are two fishes joined by their tails, and there are other fish designs. Similar carvings with slight variations or omissions are figured by De Clerq and Schmeltz (1893, pl. 25, figs. 2, 11, Humboldt Bay), who call it *sjori;* Preuss (1899, pl. 5, fig. 8, Humboldt Bay, fig. 9, Sechstroh River, fig. 11, Walckenaer Bay, fig. 12, Attack Harbor); Finsch (1888-c, pl. 22, fig. 4, Attack Harbor); Hornell (1923, figs. 10, 11, Humboldt Bay); Lorentz (1905, p. 50, Tobadi); Chauvet (1930, pl. 107, figs. 407, 408, Terfia-Demta, Matterer Bay, fig. 409, Attack Harbor); Fuhrmann (1922, pls. 30, 32).

The outrigger is always to starboard. The two booms (*wariat*, S; *wacheare*, *wagear*, etc., F; *toya* at Jenbi, F) are about 5 to 7 meters long and are fastened amidships to the dugout and strakes with *nâche*. "The booms are curved slightly at both ends in Polynesian fashion" (F). In a canoe 5.5 meters long the booms were 3.3 meters long (F). The float (*tsam*, S; *sam*, *sama*, F) is always considerably shorter than the canoe, the ends point upward. There are two divergent pairs of undercrossed attachment sticks (*azoze*, *atot*, *atote*, etc., F) for each boom. In some attachments one member of a pair appears to be nearly vertical and the other decidedly oblique (S, fig. 133; M and P, 1900, pls. 2, 4, 5); but Friederici mentions only "two thin sticks".

The platform (*wakob*, S; *kobe, wakobe, kop, wakop*, etc., F) rests on the booms, over which it does not project, and extends beyond each side of the hull 2 or 3 feet (fig. 178, *b*). Longitudinal saplings rest on the booms, upon these are transverse saplings (*samrari*), and the flooring consists of longitudinal palm laths. On the off side of the platform is a railing which rests on the longitudinal saplings; the upper edge is composed of two thin longitudinal poles, between which are fastened, at each end, a pair of undercrossed sticks which support the thwart pole (fig. 178, *b*). In the center is a widely extended pair of crossed sticks (*ania*) and a few vertical sticks. From the outer pairs of crossed sticks, respectively, a fore and an aft thwart pole (*samrari*) slopes down to starboard to be firmly fastened between two stringers lashed on the booms well beyond the hull. There is a second pair of stringers 1.5 feet farther out on the booms. These two pairs of stringers clamp three horizontal transverse spars which project toward the float, the free ends of which are carved to represent some animal (pig, cassowary, hornbill, snake, etc.); they serve to support weapons and sometimes also the mast and sail (S, figs. 130, 133; P, pl. 5, fig. 18; M and P, 1900, pls. 2, 3, 4). A fireplace is usually carried on the platform; it generally consists of a wooden box with a layer of ashes; in one canoe a small carapace was so employed (S). The bract of a palm serves as a bailer (*gai*, S). The paddles (*tchau*) have no crutch.

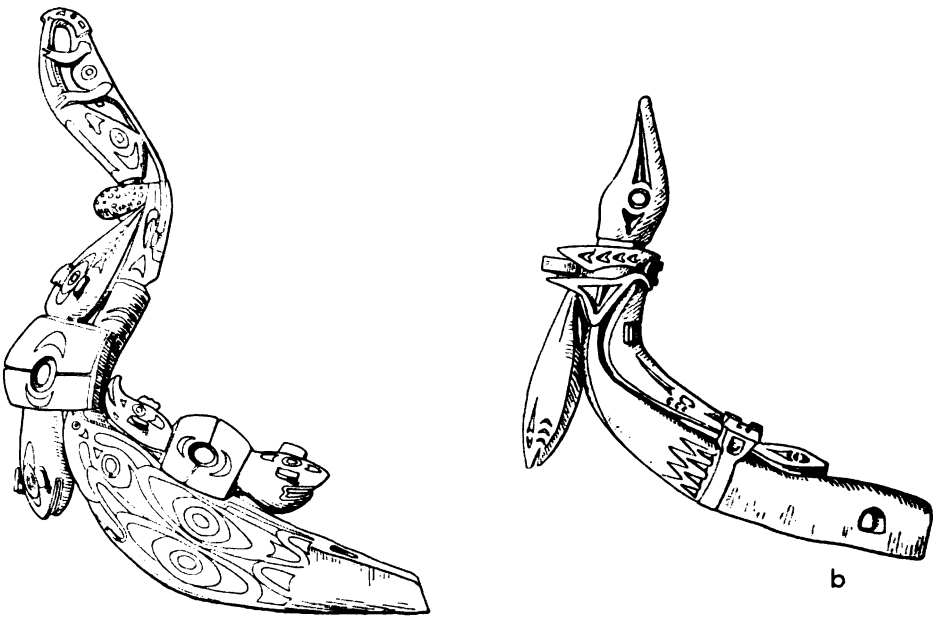


FIGURE 177.—Fore added-pieces or figureheads (*wache meti*) of Humboldt Bay canoes: *a*, a dog (*gonje*) standing on the beak (*suge*) of a cormorant (*wamdi*), the crop (*foretuge*, "bag") is below the head, below this is a *serebache* fish whose tail (*chase*) joins that of a shark (*oi*), the projections are fins (*potuge*). On the convex border connected with the dog's tail are wings and tail of a small black bird (*waime*) and below this the tail and body of a sawfish (?) with a square head (these are not intelligible in the side view). Above the base (*no*) are a *serebache* and an *oi;* "sides with carved ornament (*ane senobune*) consisting of three eye ornaments and a fish figure" (after Van der Sande, 1907, pp. 209, 211, pl. 23, fig. 4). *b*, fore added-piece, horizontal length 13 inches, from a small canoe (Cambridge Museum, presented by James Hornell).

The mast (*abiai*) is approximately 15 feet high; or it may be 8 to 10 feet high (G, p. 174). It is made of a sapling, the top of which is bifurcated for reeving the halyard, and is usually ornamented with cassowary feathers which serve evidently as distinctive signs; the people of Ingras and Ingran may carry only one plume, whereas those of Tobadi may carry two, three, or four plumes. There are two steps (*abe genu, abiai genu*) for the mast near the fore edge of the platform, one to starboard and the other to port. "They are formed upon

two athwartship spars (*samrari*) which actually bear the foot of the mast, but to prevent the slipping of the mast athwartships, at each step, by means of strong rattan, a pair of fore-and-aft spars is lashed, fitting between the laths of the platform" (S, p. 204).

The rectangular sail, which is much higher than it is broad, is made of pandanus leaves sewn together horizontally and is fastened to a horizontal yard and boom. A single halyard is bent to not quite the middle of the yard and is rove over the fork at the top of the mast and a sheet is fastened to the boom near the clew of the sail. When not in use, the sail is always rolled up from the bottom to the top and laid on the carved spars. The mast is stepped in the *abe genu* which is on the windward side and leans forward against the fore thwart pole (*samrari*); it is maintained in this position by a fore stay passing from the masthead to the bow. A second stay or shroud in many canoes passes around the outside end of a boom and from there runs back to the foot of the mast, which it encircles together with the *samrari*. To take this rope outside, one of the sailors has to jump overboard. All ropes are made of bark fiber (S). When the sail is unfurled the halyard is generally belayed at a point toward the stern. If there is a steady breeze and a fixed course the sheet is also belayed. In the event of a sudden gust of wind threatening to capsize the craft, the crew is always prepared to act as ballast by posting themselves on the platform or, if necessary, to scramble on to the outrigger.

A great speed is attained by these narrow boats when running before the wind. In sailing along the coast the land and sea breezes are abeam. Close-hauled the craft are of little use, for they cannot beat to windward. In quiet harbors, when not in use, these canoes are beached or more generally tied to the platforms of the houses. When the sea is rough they are kept on top of the platforms (S, 1907, fig. 96) or on the large platform in front of a "temple" (*karewari*). (See Lorentz, 1905, p. 135.) Occasionally the hull is supported well out of the water on a small stage, the float being supported by two forked posts (S, 1907, fig. 180). A canoe sailing stern first is illustrated by Lorentz (1905, p. 36) but the details are not clear.

In the Basel Museum is a *wache* from Humboldt Bay:

The hull is 5.8 meters long, the opening 15 cm wide. A pair of internal crossed struts support each boom; they are inserted into protrusions from the hull and are elaborately lashed together and to the boom. The stern of the hull ends in a pointed knob. A washstrake 12 cm high runs along the whole length of the hull. At the bow between the strakes is the usual figurehead; on the front of the neck of the cormorant is a carving of two dogs copulating, and on the back is a man holding a stick. Fishes are painted in red and black on the strakes. The platform lies between the booms; on the port side it is composed of slats resting on six spars. On the port and starboard sides of the platform is a rude double railing, composed of vertical sticks clamped by three tiers of horizontal rails; on the starboard side it is wider, as the mast goes between the horizontal rails. Between the two upper pairs of horizontal rails, at the ends and in the center, there project to starboard three squared sticks carved at the end into a shark's tail; these can be compared with the spear-holders of the Liki canoes. There are two long booms with attachments consisting of two pairs of widely divergent undercrossed sticks. The float is flattened above and is 4 meters long. The mast is 4.18 meters high with cassowary feathers at its head. The bluntly pointed foot is placed aft of the fore boom on the starboard side and between the horizontal elements of the starboard railing. Two stays are fastened to the aft boom from the top of the mast. An oblong pandanus mat sail, which is 2.72 meters long and 1.25 meters broad, has six transverse spars which have tufts of cassowary feathers at their ends. The halyard is rove through a sling which is suspended on the prong lashed to the head of the mast.

Hornell informs me that in 1918 he saw several large sailing canoes (fig. 178, *a*):

A large platform extended for some distance on the off side of the hull as a counterpoise. On the outer (off) side of the platform were two low parallel rails set about a foot apart, they were strengthened by a pole at each end which ran downward diagonally across the cavity of the hull, its lower end fitted beneath a cleat on the inner side of the hull. A small dugout canoe was sometimes cradled in the space between the rails. The outrigger attachment con-

sisted of two pairs of sticks converging over each boom. Across the stringers were spear rests, which were sometimes carved to represent a lizard or a crocodile with the head directed toward the hull. The mast was stepped in the middle of the fore part of the outrigger platform. A side stay ran from the masthead to the outer end of the fore boom; a second stay, or the halyard (?), ran to the aft edge of the outrigger platform. The sail was a tall narrow rectangle of matting, bounded top and bottom by a bamboo spar. A yard projected about a foot beyond the margin of the sail and was ornamented with a tuft of cassowary feathers. In some canoes another tuft was attached to the margin of the sail a little way below.

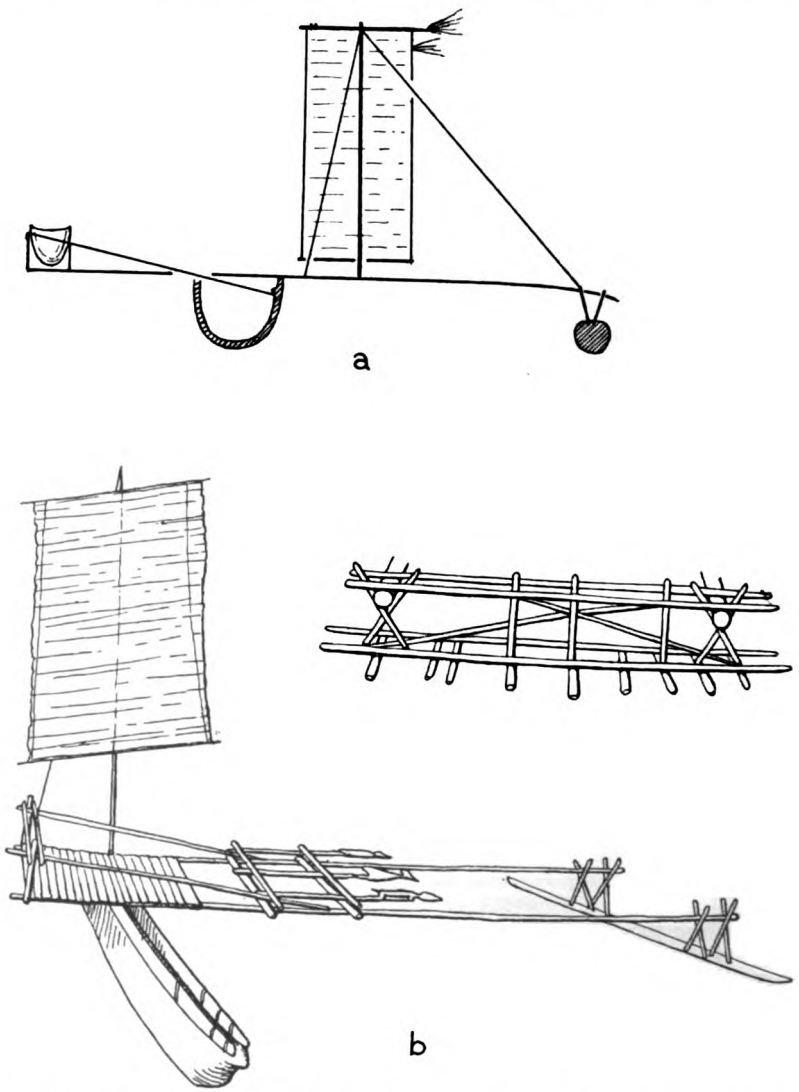


FIGURE 178.—Canoes of Humboldt Bay, Netherlands New Guinea: *a*, section of a sailing canoe (after a sketch by James Hornell); *b*, *wache* with detail of the railing of a platform (after Van der Sande, 1907, figs. 129, 130, 133).

On Lake Sentani are elegant dugouts (*isja*) without any additions. A *wache* of the Humboldt Bay type, at the islet of Ase in the lake, is shown by Van der Sande (1907, fig. 131), but no mention is made of it in the text.

DISTRICT WEST OF HUMBOLDT BAY

The area between Humboldt Bay and Cape D'Urville may be regarded as one ethnographical district. The main geographical features are: Tanah-Merah Bay (140° 20′ E.); Matterer Bay (140° 5′); Walckenaer Bay (140° 5′ to 139° 40′); the Bonggo coast (139° 35′ to 139° 15′), with the Podena Islands; the Takar coast (139° 15′ to 138° 50′), with the Arimoa or Kumamba Islands of which the following are referred to: Jamna (139° 12′); Masi-Masi, Wakde (139°); Moar and Liki (138° 42′); the eastern islands are off the Takar coast and Liki is off the Saar coast (138° 50′). The mainland peoples of this area speak Papuan languages and it is interesting to note that the removable figureheads of the canoes of the opposite islands are wanting in the craft of the Takar coast, which is inhabited by non-seafaring Papuans. Friederici (1912, p. 256) says that the small vocabulary he collected in Jamna confirms the impression made on him by the physique of the islanders that there is a considerably stronger "Polynesian" element present than among the Geelvink Bay people or even than among the Melanesian inhabitants of Humboldt Bay.

I have not been able to find any information about the canoes in the region between Humboldt Bay and the Arimoa Islands, but at Tarfia Island in the Dempta district, Matterer Bay, 40 to 50 miles west of Humboldt Bay, canoes have the characteristic bow figurehead of Humboldt Bay, as has already been noted.

Arimoa Islands

The earliest illustration of a canoe of "Moa, Gamna, and other neighbouring islands," is that drawn in 1643 and given in Tasman's Journal. Valentijn (1724, p. 57, pl. no. 27. XX) based his drawing on this, but he made various omissions, additions, and modifications, as was his wont. Forrest (1779, pl. 16 and reproduced in the French edition) copied Valentijn's drawing with fair accuracy. In the 1919 edition of Tasman the island of Moa is called Wakde. Tasman (1919, p. 123) shows a small canoe paddled by one man:

> The ends have a decided rake and are pointed; the edges rise up slightly fore and aft. At bow and stern is a vertical squared stick which expands into a carving that inclines inboard. The erections differ from each other and both are unlike anything subsequently recorded. The two booms are widely spaced and lie over the gunwales. The rather short float is pointed and raked. Each attachment consists of two pairs of short sticks that lean against the boom. A stringer is tied under the booms at about one third of their length, and five false booms, or spear-holders, are inserted into the side of the hull and fastened below the stringer; their free ends are carved apparently to represent heads of animals. A spear, fish spear, bow and arrows are laid across the booms. The paddle has a simple grip.

At Jamna (Yamna) Island, according to Friederici (1912, p. 255), who saw some very large boats, the craft (*waga*) are well made and look seaworthy. The bow has a blunt appearance, as the figurehead is commonly curved slightly backward. "The favorite painted pattern is a fish." The struts (*bunibuni*) in the hull are like those of Jotefa, Humboldt Bay. There are two booms (*kaida*); the attachment sticks (*feto*) of the float (*samo*) to the booms are longer and thinner than those at Jotefa, but are fundamentally of the same form and arrangement. Only a few small craft are without a platform. If there is a railing it is higher than that of the Humboldt Bay canoes. There are one or two stringers on the booms; three spear-holders (*kaiyanya*) project from the platform over the stringers. When there is no platform the spear-holders lie over two or three stringers, one of which is at the middle of the booms while the other two are close together

about 40 cm from the edge of the canoe. The outrigger is to starboard; in this Van der Sande concurs (1907, p. 200), though De Clerq and Schmeltz (1893, p. 92) state that at Jamna, Masi-Masi, and other islands east of Point D'Urville the outrigger is on the left side as it is on the Tumleo canoes.

Hornell sent me a plan of a Wakde canoe which shows that it is similar to the usual type of Humboldt Bay. The three stringers support three spear-holders which end externally in a shark's tail. The attachment consists of two divergent pairs of undercrossed sticks. A platform extends some distance on the off side; the railing at the end is supported fore and aft by a very short diagonal brace. Hornell says (1923, p. 70) that all the canoes of Wakde Island have a dugout hull and a washstrake. The end-pieces differ in the large and small canoes (fig. 179, *a, c*). He adds:

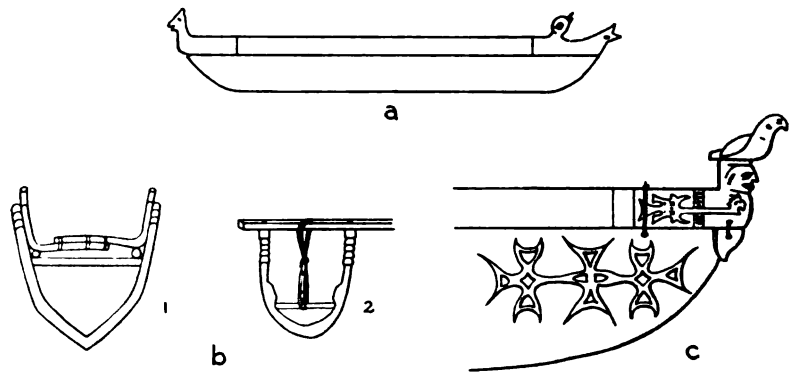


FIGURE 179.—Details of canoes of Netherlands New Guinea. *a*, side view of a small canoe with outrigger omitted, Wakde, Arimoa Islands (from Hornell, 1923, fig. 1). *b*, sections of hulls with *gabbagabba* weather-screens, Geelvink Bay: 1, Ansus (from Friederici, 1912, fig. 37); 2, Manokwari (from Hornell, 1920, fig. 6). *c*, fore end of a large canoe, Wakde, Arimoa Islands (from Hornell, 1923, fig. 4).

"In the latter [small canoes] the prow is carved into the form of a human head much conventionalized and quite small. Immediately behind this and at a higher level is tied one of the ornaments [*mani*]. . . The stern piece differs peculiarly from that at the fore end, for in addition to a terminal point carved into a very rude convention of a human head or at least into a projection showing nose and eyes, there is immediately inwards an upwardly projecting parrot's head, stumpy and conventional. Between these is tied a quadrangular arrangement of four human heads with the tip of the nose extravagantly elongated [fig. 180, *c*].

"In the larger canoes, the fixed stem-piece is greatly elaborated, and instead of the bird ornament being separate, it is here incorporated with the human figurehead at the bow. The bird surmounts the head and is made in one piece with it [fig. 179, *c*]. . . Upon the hulls of these larger boats, incised and low relief decoration is usually profuse (1923, figs. 4-7). . . A fish-tail motive runs through and dominates all these designs. Even human and bird figures are so treated. [Hornell draws attention to analogous designs of sea-ghosts from the Solomons, Saa, and San Cristoval; compare with Codrington, 1891, pp. 197, 259.] Not infrequently a pair of what appear to be evil-eye figures, male and female, are incised amidships on the outside of the hull."

Analogous end-pieces which fit on the ends of the strakes have been described by Van der Sande (1907, p. 212, pl. 22, figs. 9, 10), and were obtained at Liki. The head of the bow-piece (1907, fig. 9) was said to be that of the black cockatoo (*kokar, Microglossus*) and that on the stern-piece (*muri tabor*) to be the head of the black bird-of-paradise (*piakore*); Van der Sande reverses these attributions (p. 210) but the first identification is more likely correct; they are said to

have come from Liki. There is no carving of a whole bird on the head of this bow-piece as in figure 179, *c*. Identification of the heads as being human is apparently an assumed interpretation by various authors and not a native designation. An aft end-piece in the Cambridge Museum (fig. 180, *b*) is without a provenance, but doubtless comes from the Arimoa Islands. The heads certainly look human; except for the animal-like figure below the central head, it closely resembles the photograph given by Fuhrmann (1922, pl. 24), which likewise has no provenance; tied onto it, immediately behind the chin of the terminal head, is an aft added-piece (*fafore*) which is not unlike that given by Uhle (1886, pl. 1, fig. 6) from Podina. This specimen differs in many respects from that figured by Van der Sande (pl. 22, fig. 10).

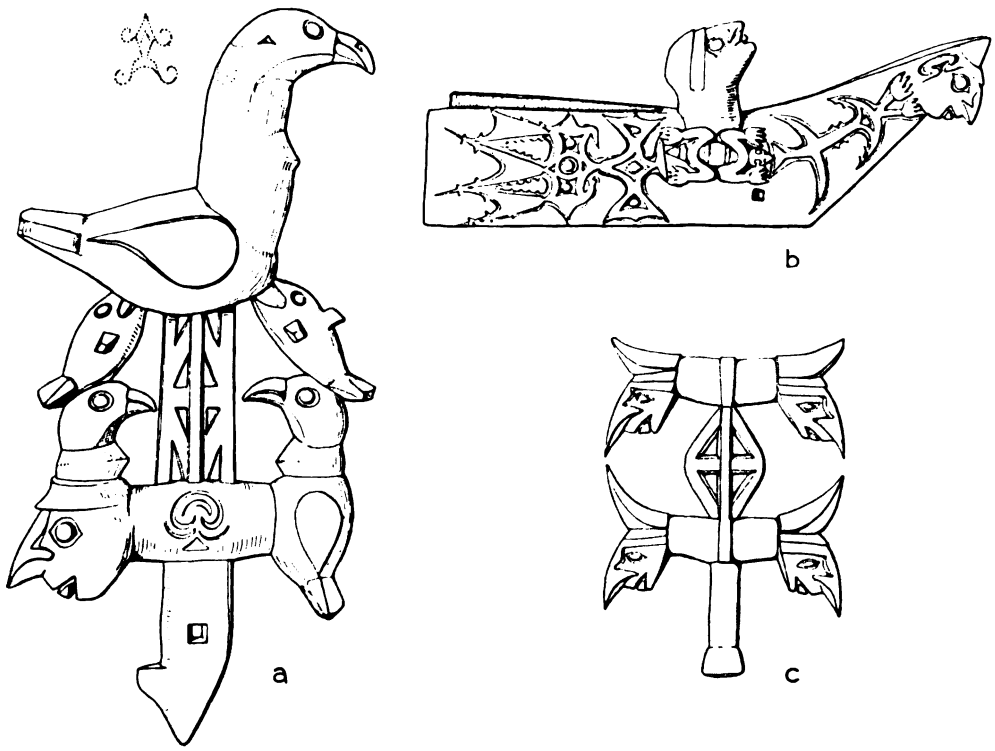


FIGURE 180.—Decorated end- and added-pieces, Netherlands New Guinea: *a*, fore added-piece (*mani*) 19 inches high, Walckenaer Bay; *b*, aft end-piece 19 1/2 inches long, probably from Arimoa Islands; *c*, aft added-piece (*fafore*) 9 1/4 inches high, Wakde (Cambridge Museum).

The detachable fore added-piece (*mani*) of the Jamna canoes is more symmetrical than the Humboldt Bay type. In the more typical ones there is a bird on the top supported in front and behind on the beak of a bird, or by a fish (fig. 180, *a*), which is unusual, and in the center by pierced carving which possibly may represent a human or animal body with limbs. This carving stands erect on a crossbar, one end of which is carved to represent a (human ?) head, commonly with a prominent nose and protruding tongue; above the head is a bird's head, the beak of which supports the bird on the top. The other end of the bar is carved to form the body of the lateral bird whose beak supports the bird on the top, or very occasionally there is a head at this end. The stem of the figurehead

usually has a hole through its lower hooklike end. I shall refer to this fore added-piece as the *mani*. It is to be found, with slight variation, in many museums and has been illustrated and described in the following: De Clerq and Schmeltz (1893, pl. 25, figs. 1, 7, Jamna; fig. 10, Masi-Masi; fig. 12, Tarfia village at Matterer Bay where it is called *waumata*); Uhle (1886, pl. 1, fig. 4, Jamna); Seligman (1917, pl. *C*, no. 14664); Hornell (1923, fig. 2, Wakde); Fuhrmann (1922, pls. 25, 28); Chauvet (1930, pl. 107, fig. 403, Podena, and fig. 405, Duperrey). A variant of the *mani* type is figured by Uhle (1886, pl. 1, fig. 5) from Podena Island. Three of the figureheads illustrated by Seligman (1917, pl. *C*) are also given by Fuhrmann (1922, pls. 26, 27); they belong to the same type as that from "Merat (Jamna)," illustrated by Chauvet (1930, pl. 107, fig. 404) who also figures an aberrant type from the same island (fig. 406).

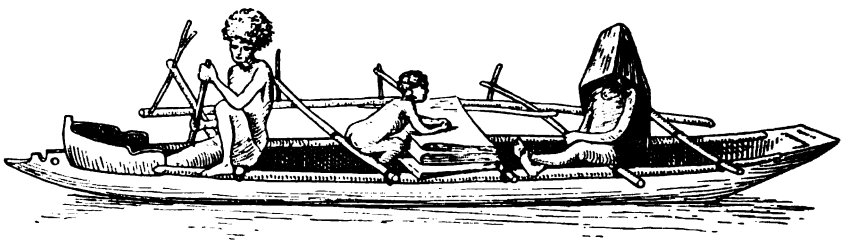


FIGURE 181.—Single outrigger canoe (*wa*), Ansus, Netherlands New Guinea (after Guillemard, 1889, p. 404, and the original photograph).

The aft added-piece from Wakde referred to by Hornell and figured by him (1923, fig. 3) consists of two horizontal bars, each terminating in a face; between the bars is a simple pierced carving and the stem is perforated (fig. 180, *c*). A similar added-piece from Podena is given by Uhle (1886, pl. 1, fig. 6), and another by De Clerq and Schmeltz (1893, pl. 25, fig. 3) from Masi-Masi is called *fafore* (a term which I propose to adopt), and is said by them (1893, p. 97) to be placed in the stern to attract fishes; (see also Fuhrmann, 1922, pls. 24, 29, 31).

The paddles (*faso*) of Jamna are without a crutch and resemble those of Jotafa, Humboldt Bay, but the small nose at the end of the blade is absent (Friederici, 1912, p. 255).

On Liki Island the canoe appears (Van der Sande, 1907, fig. 136) similar to that of Jamna and has similar ornamentation. The outrigger is on the starboard side; the two booms, which are amidships, do not project over the port side. The float has upturned pointed ends and appears to be nearly as long as the hull. The attachment consists of two divergent pairs of undercrossed sticks. There is no true platform. Lashed evidently to stringers are the usual three spear-holders, their ends with "curved points, not unlike the heterocercal caudal fin of a shark" (Van der Sande, p. 201). A washstrake is present.

GEELVINK BAY

The Geelvink Bay district may be taken to extend from Cape D'Urville or Amberno in the east (137° 50′) to Cape Saweba or Veakke in the west (about 130°). The only mainland places to be mentioned are Kwatisore in the fundus of the bay (135°), Wandamen coast on the east side of Wandamen Bay, and Manokwari (Doré, Dorey, etc.) in the northwest. In the mouth of the bay the islands which here concern us are: the Schouten (Misore) Islands, including

Supiori (Suk) and Wiak (Biak). The village of Wari is on the north coast of Wiak, that of Mokmer on its south coast, and that of Bosnik at its east end. The village of Korido is on the south coast of Supiori; probably this is the Kordo of Uhle. In the middle of the bay is Japen (Jobi), on the north coast of which are Pom and Sirewen and on the south coast Serui, Wooi Bay, and the small island of Ansus. Numfur (Nufoor, Mafur) lies between Wiak and Manukwari. Guillemard (1889, p. 406) writes of the Ansus canoe (fig. 181):

"Such a thing as a built boat is unknown, and all are 'dugouts,' made by burning out the trunks of trees with charcoal. . . . After the finishing touches have been put to the craft, they are filled with water and kept sunk for a time, in order to counteract the tendency to split. They are outrigged almost without exception on one side only, and though the outriggers are but clumsily constructed as compared with those of the Dorei Bay people, the Ansus men are much more given to adorning their boats than their western neighbours. Bits of red and white rag, coloured leaves or flowers, and various shells are constantly used for this purpose, and the bows of the craft are sometimes ornamented with fretwork figure-heads . . . no two of them appear to be alike."

Friederici (1912, pp. 252, 254) refers to *Ovulum* shells as ornaments on the outriggers of many canoes at Ansus, and on the bow-terminal and on the projections of the fore washboards of many canoes at Pom and Sirewen. Hornell (1920, p. 51; 1923, p. 74) refers to the adornment of these projections with such shells at Wooi Bay (fig. 182, *a*) and at other of the villages in the islands; he once saw the tops of the connectives ornamented with an *Ovulum* shell and a bunch of leaves.

The outrigger canoes (*wa*) of Geelvink Bay have a single or a double outrigger with numerous booms and a special method of attachment. Friederici (1912, pp. 249-251) calls attention to the fact that Forrest, D'Urville, and Raffray mention only double outriggers at Manokwari. De Clerq (De Clerq and Schmeltz, 1893, p. 92) says the large canoes have two outriggers and the small ones a single outrigger, on the starboard side, but Friederici did not see one of the small canoes with a single outrigger; Hornell saw several in the harbor only. There is a similar overlap, but with a predominance of the single outrigger, at the Schouten Islands, on Japen, and farther within the bay along the mainland and, according to De Clerq, on the Wandamen coast. The easternmost double-outrigger canoe known to Friederici is that noted by D'Urville near the mouth of the Mamberamo, but it is doubtful to what locality this craft really belonged. No double outrigger is indigenous east of Cape D'Urville; Geelvink Bay is thus a mixed area. The double outrigger of Indonesia is found along the north coast of New Guinea up to the eastern entrance of Geelvink Bay and predominates in the western part of the bay, whereas the Oceanic single outrigger extends throughout the bay as far west as Cape D'Urville and predominates in its eastern part.

The following account is based on Van der Sande (1907, pp. 206-213), Friederici (1912, pp. 249-255), Hornell (1920, 1923, MS.), and supplemented from De Clerq and Schmeltz (1893), Guillemard (1889) and several others; the most quoted authors are designated by their initials:

The hull is an ordinary slab-sided, double-ended dugout (H, 1920, p. 47); it is wider than the hulls of craft farther east and this necessitates the use of transverse planks as seats. The greatest breadth is between the gunwales (S, p. 206).

At Mokmer, Friederici (p. 251) measured canoes (*wa*, *wai*) up to 12 to 15 meters long and 4 to 5 meters in outrigger breadth. In the hulls of these canoes are straight struts which extend from side to side and above these is a pair of knees, the horizontal limbs of which overlap and are tied together (fig. 179, *b*, 1). There are perforated longitudinal ridges (*fafor*; *patnati*, F) within the upper edge of the dugout and along the length of its bottom. As in the Solomon *mon*, lashings of rattan, liana, or *arenga* pass upward from the holes to make fast

the struts and booms. A section of a Manokwari canoe (fig. 179, *b*, 2) shows a strut below a broad longitudinal ridge on each side of the hull; the boom is lashed to the strut. Friederici (1912, p. 249) refers to longitudinal poles between the upper transverse struts (*pampumbe*) and the booms. In Ansus (fig. 179, *b*, 1), however, they do not run along the whole length of the hull, but they are absent in the middle and again farther aft in a section between two booms (F, p. 254). The longitudinal poles within the hull recall those in the *mon* and in the *orembai*.

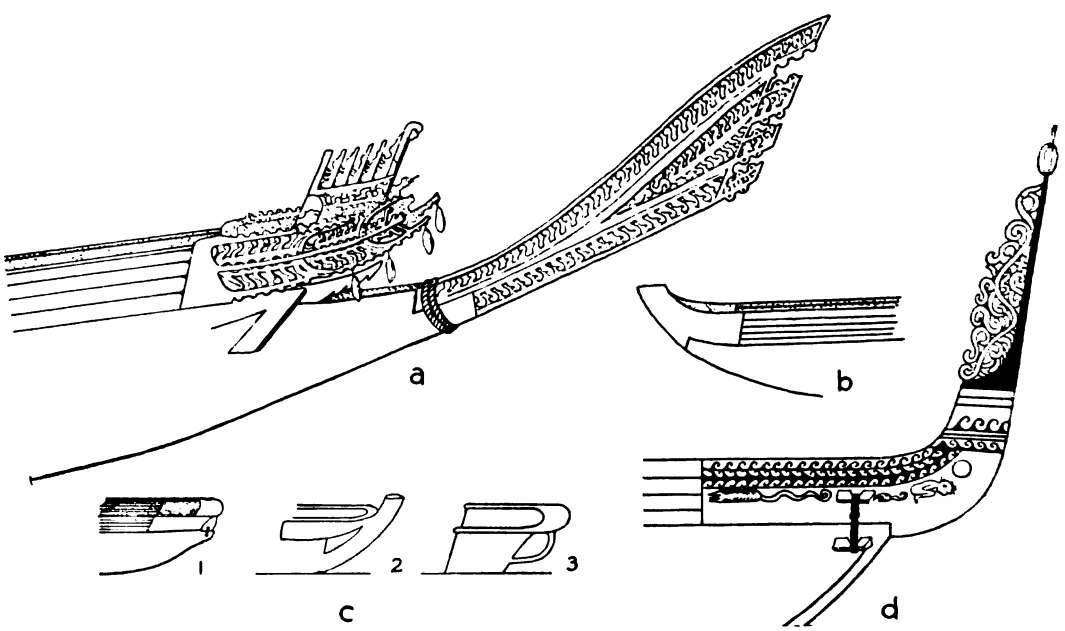


FIGURE 182.—Ends of Geelvink Bay canoes, Netherlands New Guinea. *a*, fore end of a large double-outrigger canoe, Wooi Bay, Japen, showing *gabbagabba* weather-screen and gunwale pole, fore washboards, median piece, spur, and bow-terminal; the washboards are drawn too horizontally (modified from Hornell, 1920, fig. 10; 1923, fig. 14). *b*, fore end of a small canoe with end-piece and weather-screen, Manokwari (from Hornell, 1920, fig. 7). *c*, aft end-pieces: 1, Manokwari, same canoe as *b* (from Hornell, 1920, fig. 8); 2, 3, Pom (from Friederici, 1912, figs. 41, 44). *d*, fore end of a large double-outrigger canoe, Manokwari, showing projection end-piece and prow-affix (from Hornell, 1920, fig. 9; 1923, fig. 13).

Paris (1841-43, pl. 104, fig. 16) gives a section of a double-outrigger sailing canoe with four booms. A horizontal strut crosses the hold and rests on a cleat at each side, and there is another below it; these struts are lashed together in the middle. A thwart passes over the gunwales and a longitudinal pole lies over each end above the gunwales; on these poles the booms are laid and two strong lashings connect the boom with the thwart and the two struts.

The height of the sides of the dugout is generally increased by the addition of a weather-screen composed of several superimposed leaf-stems of the sago palm (*ampe*) for which Friederici adopts the term *gabbagabba*, the Moluccan name for the leaf-stems, derived perhaps from the Ternate language. The *gabbagabba* are fastened horizontally with the concave side downward and are usually three or four in number, but Friederici saw, at Pom and Sirewen on north Japen, two, or at most three. He says (1912, p. 253) that there is sometimes a gunwale lath above them. A section of a Manokwari canoe shows four rows of *gabbagabba* topped by a square bar of soft wood to form a gunwale, the whole secured in position by vertical pegging (fig. 179, *b*, 2). There is usually no addition to the sides of the smaller canoes; though there may be a gunwale pole (figs. 181, 184). An illustration of a model of a *wapai* canoe from Wosimi, Wandamen Bay (C and S, pl. 24, fig. 7), and another of a double-outrigger canoe of Wakobi (S, fig. 138), show a washstrake on each side, upon the edges of which thwarts are fixed; upon the thwarts immediately above each gunwale is laid a long thin pole which thus forms a low rail. The *wapai* has *sara* end-pieces, but the other canoe has no aft end-piece.

The bow of the dugout is variously finished off: 1, In the smaller craft it is generally produced into a simple or carved horizontal projection with or without a slight upward curve (fig. 184) (S, fig. 137, Kwatisore). In the original photograph of an Ansus canoe it has a scalloped upper edge and a perforation (fig. 181). This "heavy projection . . . is useful in beaching and for the better lifting of the bow in the surf" (S, p. 206). 2, The bow in the larger canoes may have a stepped upper edge upon which a carved bow-terminal is fastened; its lower border is stepped to fit the bow (fig. 188) (F, figs. 45, 46, *arpek*, Pom). The bow-terminal carries on the line of the upward sweep of the bow; it is, in many canoes, ornamented richly with painted scroll fretwork and carving (fig. 182, *a*) (F, p. 252, Pom, Sirewen; S, fig. 140, Numfor; H, 1920, fig. 10; pl. 3, fig. 4, Manokwari, Wooi Bay).

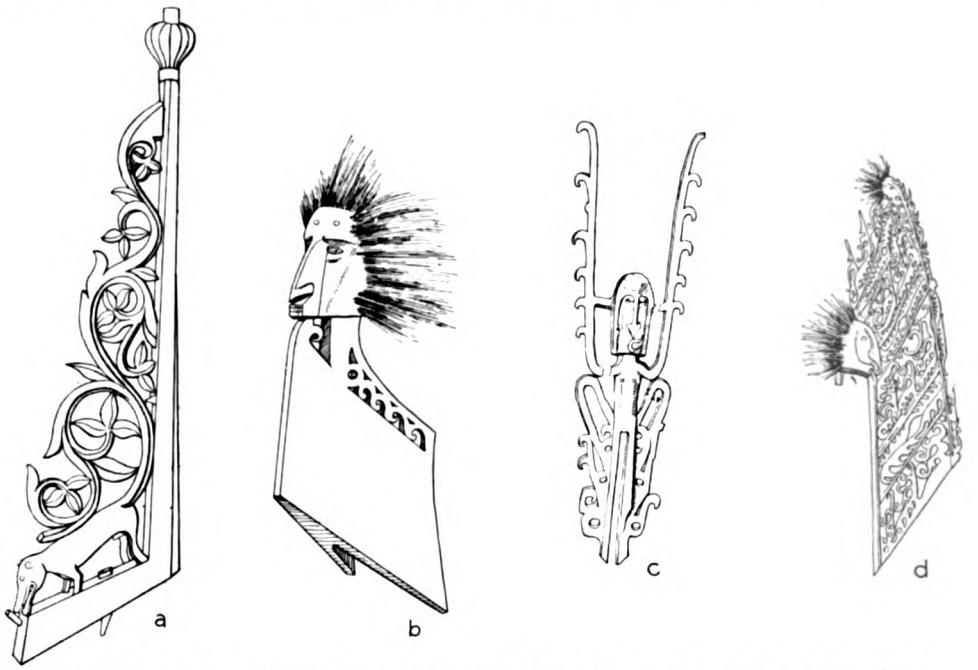


FIGURE 183.—Adjuncts to outrigger canoes, Geelvink Bay: *a*, prow-affix (after Mantegazza, 1877, pl. 13); *b*, fore end-piece, Mafur (after Mantegazza, pl. 13); *c*, *oera*, Tandia, Wandamen Coast (after De Clerq and Schmeltz, 1893, pl. 24, fig. 3); *d*, median-piece (after Mantegazza, pl. 16).

The bow-terminal is undoubtedly derived from Indonesia, where are seen analogous long, thin, carved and painted terminals which curve upward and are similarly stepped on the bow of the hull (Müller, 1912, fig. 17, Nicobars with fretwork, fig. 31, Sangir). Many canoes have a solid V-shaped fore end-piece. The central portion may extend for a short distance along the top of the bow of the hull, and the ends of the wings abut against the fore ends of the *gabbagabba* when this weather-screen is present (fig. 182, *b*). The apex of the fore end-piece in some canoes is produced into a vertical knob or more commonly into a well-carved human head with additional carving and fretwork (fig. 183, *b*). The hair is represented by cassowary feathers or the stiff fibers of the leaf stalks of the palm, *Arenga saccharifera* (Mantegazza, 1877, pl. 13, no. 893, from Mafur; Uhle, 1886, pl. 1, fig. 2, Kordo; C and S, p. 95, pl. 25, fig. 6, *bok*, from Korido, on Supiori). The end-piece, instead of being placed well behind the bow, may be fixed far forward so that its fore edge continues the upward curvature of the hull (fig. 182, *b*) or slightly projects beyond it. The upper end or apex is usually cut square (C and S, pl. 24, fig. 7, model of a *wapai* from Wosimi, Wandamen Bay; S, fig. 141; F, fig. 33; H, 1920, fig. 7—all from Manokwari). Friederici (1912, p. 249) terms this the *sara* form, in the larger canoes it is ornamented by a carved snake in the act of swallowing a human head. Hornell describes a decorated fore end-piece cut from the solid and fitted upon the fore end of the hull by means of pegs and by a lashing on each side passed through holes cut in projecting cleats left when shaping these parts (fig. 182, *d*).

In the largest canoes, all of which have a double outrigger, as in those at Manokwari, there is fitted into a slot in the upper surface of the apex of the end-piece a tall, narrow pointed board which I here term the "prow-affix". I consider that the prow-affix is a different structure from the bow-terminal. It may be variously carved in fretwork and painted (fig. 182, *d*) (F, fig. 34, Wooi Bay; H, 1920, p. 48, fig. 9, pl. 2, fig. 3; 1923, p. 73, fig. 13). Immediately below the point is a pumpkin-shaped, oblong knob which is usually hexagonally grooved. A fretwork board with a ribbed ball at the top and below a carved animal (dog ?) whose tail is prolonged into long leafy scrolls, figured by Mantegazza and described by him as of Ternate style, is evidently a prow-affix (fig. 183, *a*). A photograph of a large canoe of Geelvink Bay (S, fig. 139) shows a plain prow-affix; beyond the ball at the top there is a long flagstaff carrying a large flag.

A variant of the end-piece drawn by Paris (1843, pl. 104, fig. 13) and copied by Müller (1912, fig. 46) of a large sailing double-outrigger canoe with a tripod mast, at Manokwari, shows a squared vertical end-piece projection, and a forward-reaching, nearly horizontal projection with a squared end. The latter carries on the line of the bow of the hull and corresponds in general appearance with the bow-terminal of other canoes, but in the drawing it looks as if it were a prolongation of the end-piece.

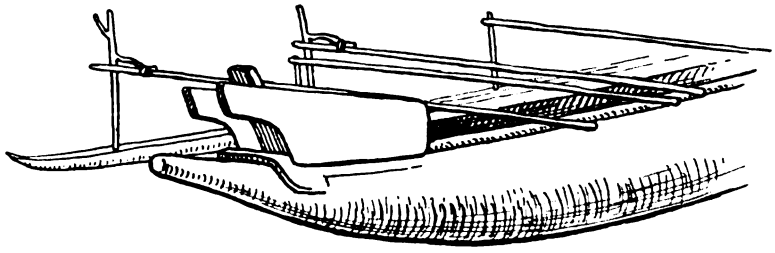


FIGURE 184.—Fore end of a single-outrigger canoe, Ansus, Geelvink Bay, showing transverse ridge and lateral bracket, gunwale pole, fore washboards, breakwater, and two forms of connectives (after a photograph).

The V-shaped fore end-piece is in many canoes replaced by two parallel or slightly converging boards (washboards), and by a breakwater between them (fig. 184) (S, fig. 137, Kwatisore; H, 1920, pl. 3, fig. 4, Manokwari). These may be plain or painted, but typically they are pierced by a delicate and intricate fretwork. Hornell (1920, p. 50, fig. 10) says that he saw this structure on canoes furnished with a bow-terminal at Manokwari but more numerously at Wooi Bay, Serui, Bosnik, and Pom, all settlements in Japen, and on the adjacent islands; he states (1923, p. 73) that it is more prevalent than the end-piece as it is used in medium-sized canoes which are more numerous than the very large ones. The upper fore angle of each lateral board is produced into a horizontal or in some canoes into a slightly turned-up spur or a slender point (fig. 188). (See Friederici, figs. 40, 43, 45, 46, which are all from Pom.) Hornell (1920, p. 50; 1923, p. 73, figs. 14, 15) describes and illustrates fore washboards decorated with fret-scrolls on a canoe at Wooi Bay, Japen, and he has given me additional information (fig. 185). On the top of the solid part of the fore end of the dugout and immediately in front of the hollowed-out portion is a transverse ridge, the ends of which project beyond the narrowed end of the dugout and are continued down each side as a kind of bracket in high relief; there is a slot in the center of the ridge. The fore side of the breakwater abuts against the ridge, and in a hole near its lower end is inserted a median spur, the base of which fits into the slot in the ridge; the purpose of the spur is to lock the breakwater in position. The basal portion of each fore washboard abuts against the *gabbagabba* weather-screen; it also rests on the edge of the dugout and abuts in front against the transverse ridge.

A beautiful fretwork board, the median-piece, is furnished on its aft edge with a pintle peg to fit over the top edge of the breakwater (figs. 183, *d*, 185, *b*). The head of the pintle is carved to represent a human head, and another smaller head is often carved at the upper fore corner of the median piece; the lower end rests on the spur. De Clerq and Schmeltz (pl. 24, fig. 4) illustrate a *bok* from Korido, Hornell (1923, figs. 16, 17) gives two examples from Manokwari, and Fuhrmann (1922, pl. 23) illustrates another.

Hornell (1920, p. 54) saw a bow structure at Pom: "Instead of a pierced median plank at the fore side of the bow bulkhead [breakwater], the owner had placed a rounded or head-shaped ornament covered with tufts of black fibres let into holes punched over the whole sur-

face to give the appearance of a human head . . . its employment is to obtain protection for the canoe against evil spirits." He says (p. 51), "In the recess in the bows provided by this ornamental structure [the washboards] is stowed the shallow basket holding the turtle harpoon line."

A carving, which is usually bipartite below so as to be more securely attached, represents a squatting human figure with fretwork arms and legs (fig. 183, *c*) (Mantegazza, pl. 15, no. 896; C and S, p. 95, *oera* or *hoera*, Tandia, Wandamen coast; S, p. 212, *manga nume*, Wari, used on small craft). It may be a fretwork board with a squatting figure on top (Uhle, 1886, pl. 2, fig. 5; Ansus, fig. 6, Dore; C and S, p. 94, pl. 24, fig. 9; *oera* or *hoera*, Wasior, Wandamen coast; Guillemard, 1898, p. 408; S, p. 212, pl. 22, fig. 8, *horie*, Kwatisore; Fuhrmann, 1922, pl. 30). Or it may be a small block of wood painted with scrolls, doubtless to indicate a squatting figure, and a human head with *arenga* or cassowary feathers as hair (Uhle, pl. 2, fig. 8, Kordo, and a simplified specimen from Dore, fig. 1; C and S, p. 96, pl. 24, fig. 8, *mangga moeen*, Wardo, southwestern Wiak). Hornell's "head-shaped ornament" evidently belongs to this series. The carved face is in such relation to the slot at the base that for the face to look forward, as it must do, the carving would have to fit on to a longitudinal board. It is clear that it can not be placed on the breakwater, but it would fit on the median spur, which so far as I know has been noted only by Hornell.

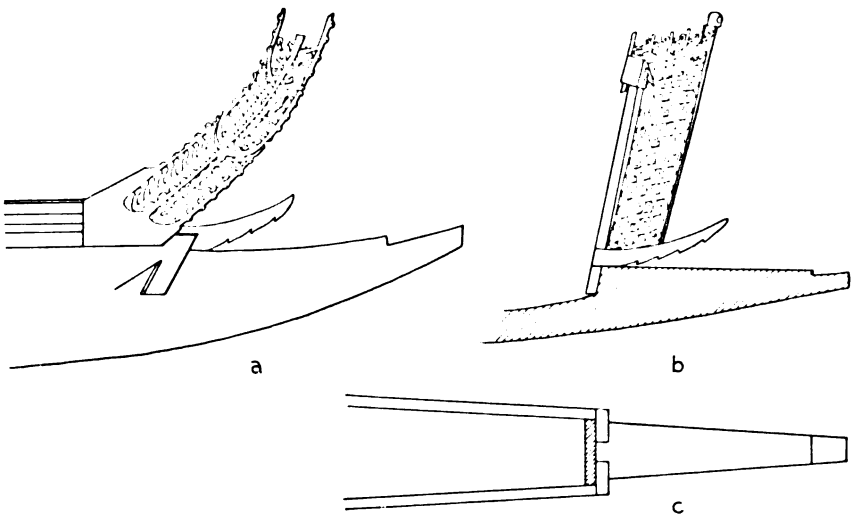


FIGURE 185.—Details of the fore end of a double-outrigger canoe, Wooi Bay, Japen: *a*, side view showing dugout with the transverse ridge and its lateral "bracket", *gabbagabba* weather-screen and gunwale lath, fore washboard, and spur; *b*, section along median line showing breakwater, spur, and median-piece; *c*, plan showing the slot in the transverse ridge, immediately behind it is the shaded breakwater (after sketches by James Hornell, and 1920, p. 50; 1923, p. 73, figs. 14, 15).

There is no information as to the position in a canoe of the following: hornbill (Uhle, pl. 1, fig. 1, Kordo); hornbill and dog (?) (Uhle, fig. 3, Manokwari); conventionalized hornbill and dog (?) (C and S, p. 96, pl. 24, fig. 2, *bok*, Korido); hornbill (C and S, pl. 25, fig. 8, Korido). The carving of a dog (C and S, p. 96, pl. 24, fig. 1, *mansoroe oerem*, Saoekorem, Little Geelvink Bay) was placed at the stern. A photograph of a Geelvink Bay canoe, erroneously stated to be from Humboldt Bay (Chauvet, 1930, pl. 35, fig. 90), shows a high affix to the bow and to the stern end-piece; each has a bold volute. Thus any of the foregoing may be either a prow-affix or a stern-affix. In the Cambridge Museum are two prow- or stern-affixes with two volutes (fig. 186, *a*); one, which is probably a prow-affix (fig. 186, *b*), represents what I take to be the black cockatoo; all are from Manokwari. I have seen various other "canoe ornaments" in museums but have not been able to find out where they should be attached.

The stern end of the dugout in the small canoe usually ends in a more or less blunt point or it may slope gently upward and be cut off squarely (fig. 181). In a model of a *tababeri* from Ansus (fig. 188) there is a small triangular boardlike projection or bracket from the end and under surface of the stern. Friederici says there is no stern end-piece in the smaller canoes at Mokmer. He refers (1912, pp. 251, 252) to the steersman's seat in the stern of large canoes at Mokmer and on the north coast of Japen which is supported by a bracket at Pom (fig. 182, *c*, 2, 3); his sketches indicate that the seat is cut out of the solid end of the hull, but in a model of a *wapai* canoe from Wosimi (C and S, pl. 24, fig. 7) the seat is an integral part of the stern end-piece. Hornell shows clearly (fig. 182, *c*, 1) the solid stern end-piece with a broad flat surface on its upper aft end in a Manokwari canoe. A V-shaped stern end-piece, often with a slight upward curve, is shown in various photographs; Van der Sande (1907, pp. 206-207, fig. 140; and see Lorentz, 1905, p. 212) refers to it as if it were common. It occurs in what he calls "the real Numfor type" of canoe which is very like the *wapai* just mentioned. The stern end-piece is absent in the smaller canoes of Mokmer, though a fore end-piece is present (F, p. 251). A carving (*mansoroe oeren*) from the stern of a canoe at Saoekorem, Little Geelvink Bay, is illustrated by De Clerq and Schmeltz (pl. 24, fig. 1).

FIGURE 186.—Prow-affixes, Manokwari, Geelvink Bay: *a*, volute, 11.25 inches high; *b*, probably represents the black cockatoo, 10.5 inches high (Cambridge Museum, presented by James Hornell).

When there is a double outrigger, as there is in all large canoes and in most of the small ones of Manokwari (H, 1920, p. 44), the booms stretch right across the hull, but when there is a single outrigger the booms do not extend beyond the off side. There are usually four to ten booms, but Hornell (1920, p. 44) saw an exceptionally large canoe at Serui with 11 booms and Friederici saw one with 12 at Wooi Bay. Hornell says the booms at Manokwari are squared poles of light wood.

The float is of an especially soft wood and is generally nearly as long as the hull, or at all events as long as its water line. The fore end is pointed, slightly turned up, and may be carved a little (H, 1920, fig. 5); the aft end is blunt. Friederici (p. 254) saw in Wooi Bay a large double outrigger canoe with 12 booms and with two floats close together on each side (fig. 187, *c*), and Hornell says that in the larger canoes at Manokwari two floats are employed on each side of the canoe; one boat of this kind with seven booms was 28 feet long, 25 inches beam, and 26 inches deep (fig. 187, *a*, *b*).

The attachment for each boom, whether with a single or double float, consists of a single vertical nail-like wooden spike or connective which passes from above through the end of the boom and is driven vertically into the float; sometimes it is lashed to the side of the boom (Hornell MS.). A piece of a bough is usually selected that has a natural thin branch projecting from it more or less at right angles; this branch is laid over the boom and lashed firmly to it (F, pp. 249, 253-254). Connectives either with or without the branch appear to be used indiscriminately and separately (figs. 181, 184, 187, *b*, *c*). The branch is absent at Mokmer (F, p. 253). When there are two floats each is provided with a connective for every boom. Hornell (1920, fig. 4) shows a rattan lashing between the two connectives of a boom on a canoe with two floats.

Friederici (p. 251) says he has not seen a single example of what he terms the Moluccan [withy] or Halmaheiran [elbow] attachment in Geelvink Bay; the spike connective prevails throughout. This attachment is more easily taken to pieces than the former connectives and the natives hang up the hulls of the canoes from the roof of the long corridor of the turtle-roofed houses.

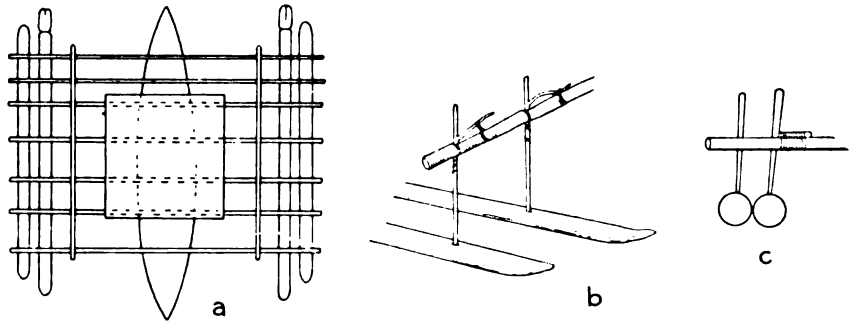


FIGURE 187.—Large double-outrigger canoe with double floats, Manokwari, Geelvink Bay: *a*, plan; *b*, spike connectives of same canoe; *c*, spike connectives, Wooi Bay (*a*, *b* after Hornell, 1920, figs. 3, 2; *c* after Friederici, 1912, fig. 51).

Guillemard (1889, p. 401) gives an illustration of a small double outrigger canoe at Ansus Harbor. There are two booms on each side which are rather close together amidships. The attachment consists of a short stick inserted into the very short float; apparently a long branch from the stick slopes up to the end of the boom to which it is lashed. The upper ends of the vertical sticks of each side are connected by a short longitudinal stick. This arrangement, of which I have not seen any other example, gives the outrigger apparatus a superficial resemblance to the canoes of Waigiu, which have an elbow connective. Another illustration by Guillemard (1889, p. 402) of a single-outrigger canoe shows normal connectives; there is an anomalous flat breakwater which is rather obscure. An unbranched spike connective is found at Nukutavake, Tuamotus (Alexander, 1902, pp. 766, 767). The spike passes through the boom to be inserted into the float. A short withy is lashed to the upper surface of the end of the boom and its lower end is lashed to the outside edge of the float. The spike is steadied by a brace of sennit twisted round it above the boom and fastened fore and aft to the float. Judging from a model, a simple spike connective may pass through the boom in Wuvulu canoes.

A model from Ansus (fig. 188) of a double-outrigger canoe (*tababeri*) with 11 booms has a direct tied attachment. In the Amsterdam Museum there is a model of a double-outrigger canoe which was collected by Max Weber; it has two curved booms with a similar attachment. Forrest (1779, pl. 11) gives two illustrations of Papuans hunting wild pigs swimming in the sea, one of which is reproduced by Earl (1853, p. 72). Forrest (1779, p. 97) describes this method of hunting at "Dory Harbour," but he does not describe the canoes, which are small dugouts with a double outrigger of two booms and a direct tied attachment. It is impossible to say to what extent the draughtsman, Vivares, was correct in his delineation of the canoe. We may, however, accept this as corroborative evidence for the existence in recent times of this form of attachment; it was used in Rawak Island, north of Waigiu, about 1820. I have not found any information as to whether this attachment is still used on actual canoes. A direct tied attachment is spread widely, though sparsely, throughout Indonesia and is very preva-

lent in the Sulu Islands and in the southern and central Philippines. Its occurrence in Nissan and North Queensland has already been noted.

At Manokwari a stringer (*aisuye, asuye*) may be lashed over the booms close to the attachment spikes and upon their branches; it is connected with the float by rattan or liana loops between the connectives. The stringer is absent in Japen and southern Wiak (Friederici, 1912, p. 249). At Mokmer, Friederici (1912, p. 251) saw stringers across the booms between the hull and a float on which paddlers sat in fine weather. A bamboo stringer is seen halfway between the cabin and the connectives on a large double-outrigger canoe in figure 187, *a*. Friederici saw on many canoes at Ansus three *Ovulum* shells tied on to the booms over the branches of the spikes, and in a very few of the better craft the ends of the booms, projecting out beyond the spikes, were slightly carved.

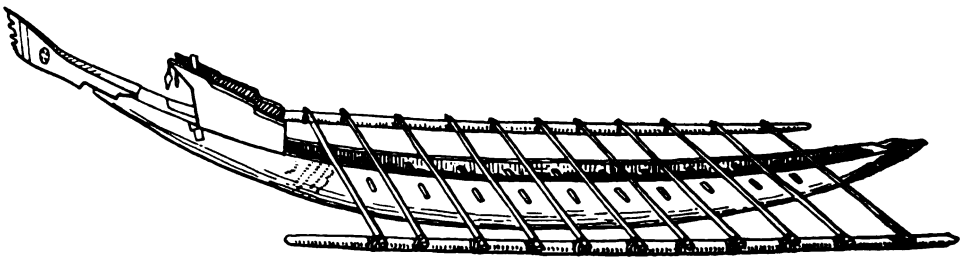


FIGURE 188.—Model of a *tababeri*, double-outrigger canoe with direct lashed attachment. Ansus, Geelvink Bay (after De Clerq and Schmeltz, 1893, pl. 24, fig. 5).

A platform appears to be usually absent but Van der Sande (1907, p. 207, fig. 138) says the Wakobi canoe "has a platform of longitudinal laths fixed on the middle of the two cross poles [booms] and curved upwards, both to the left and to the right, to form a vertical railing, about 50 cm in height."

On the larger canoes a small roof is built (Van der Sande, 1907, p. 207, figs. 139, 140, Numfor). This *atap* awning was not observed by Friederici at Pom and Sirewen on the north coast of Japen, but it is seen over the whole middle portion of the larger canoes of Mokmer on the south coast of Wiak, and at Wooi Bay and Manokwari; he says (p. 252) it belongs to the Indonesian culture and is unknown in Melanesia. Hornell (1920, p. 45) says that a cabin 10 feet long by about 7 feet wide is generally built over the platform of the larger Manokwari fishing canoes, the greater part supported outboard upon four of the transverse booms (fig. 187, *a*).

Wooden bailers have the Oceanic form (Friederici, 1912, figs. 38, 48). At Mokmer a large shell is used (1912, p. 251) and doubtless elsewhere. Krieger (1899, p. 386) says that no canoe lacks one or more coconut shells to serve as bailers; he also states (p. 386) that the anchor is a large block of wood or a heavy stone with a liana for a cable. Rattan or closely twisted bark fiber serves as cordage.

Van der Sande (1907, p. 207) says: "The paddles used here have often, at the end of the handle and cut out of the same piece, a short cross piece, sometimes also a large wooden ring"; but according to Friederici (1912, p. 253) the crutch may occasionally be an added piece. The blade is broad with parallel sides, the end is flat, rounded, or angled.

Hornell (1920, pp. 51-53) states that in all the sailing canoes in this district which adhere to the original style of rig, a tripod mast and oblong sail are carried.

This mast which is more or less prevalent throughout the eastern section of Indonesia, particularly in the Moluccas and Celebes,

". . . is here [at Manokwari] composed of three bamboos, connected at the apex by rattan or rope lashing. The smaller New Guinea canoes have usually a Y-shaped crutch peg fitting into the top end of one of the paired legs; upon this is hitched a loop attached to the yard of the sail at a point a little way forward of the centre. In larger canoes where the increased size of the sail renders it impossible for the crew to lift it high enough to hitch the loop over the mast-head peg, a hole is cut in the projecting end of one of the paired mast legs which is cut longer at the top than the other; through this hole a rope is rove and by this means the sail is hoisted. The sail is oblong with a bamboo yard along the upper edge, and a similar pole [the boom] along the lower." (See Hornell's description (1920, p. 60, fig. 21) of a tripod mast of a Galela, Halmaheira, boat.) The sail is hoisted when rolled up and as soon as the yard is supported on the mast it is unrolled from above; Friederici says this maneuver is done very simply and quickly.

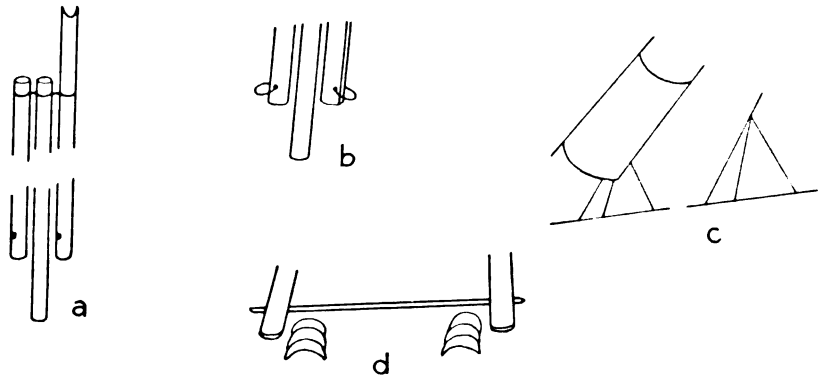


FIGURE 189.—Tripod masts, Geelvink Bay: *a*, Wooi Bay; *b*, Manokwari; *c*, Pom; *d*, Ansus (from Friederici, 1912, figs. 32, 39).

The tripod mast is a temporary erection; it is usually made of bamboo, but Friederici (1912, p. 254) found it made of wood at Wooi Bay. It does not require the support of either shrouds or stays (fig. 189, *c*). At Manokwari Friederici saw the mast tied inboard to the front of the second boom from the front, but at Ansus it was directly behind that boom. At Manokwari (fig. 189, *b*) a string loop passes through a perforation in the lower end of each leg which is passed over a spike, which presumably is fastened to a thwart. At Ansus he saw (fig. 189, *d*) the two legs supported on a stick which passes through the lower end of both of them and this rests on the *gabbagabba* sides. A similar arrangement at Ake Selaka, Halmaheira is shown by Friederici's figure 19. At Wooi Bay the longest spar of the tripod has a notch at the end to support the loop of the yard (fig. 189, *a*). Friederici speaks of a rectangular mat sail at Mokmer for the tripod mast. A canoe with a tripod mast, seen at Dorey Harbor, is described and illustrated by Paris (1841-43, p. 92, pl. 104, figs. 13-16). The sail is a narrow oblong set obliquely; there is a vang at each end of the yard and a sheet at the center of the boom. Concerning the canoes of "Port Dory", Earl (1853, p. 78) says:

"They carry a sail of matting which is suspended from a mast, forming a tripod, with two feet fixed to the side with pins, on which they work like hinges, and the third is slipped over a hook, fastened near the stem. The third foot, which also acts as a stay, is not a fixture, and is unhooked when it is required to strike the mast, which then lies over the thwarts of the prahu, and can be raised again in an instant."

Krieger (1899, p. 386) says that the Geelvink Bay people can travel in their large sailing canoes at a rate of 5 to 7 knots in a good breeze, and can go for 100 miles without sighting land. The people of Manokwari go to or beyond Ternate. The great trading voyages start as a rule in the northwest monsoon and return with the southeast trade. He adds that war canoes are larger and stronger than the foregoing; they are dugouts and are paddled rhythmically with a sort of scooping action. Sometimes four or more canoes are fastened together to form a raft.

Several times Friederici heard boat songs on the north coast of Japen as in Indonesia and the Philippines and in Polynesia but rarely in Melanesia.

The "great *corocore* of the village of Koi-Kui, Port Dorey" seen by Paris and elaborately illustrated by him is certainly not a Papuan craft. He states (1841-43, p. 91) that this *corocore* had presumably been brought over by the Malays who were established near the little village of Koihoui, and that it was very similar to the large *corocore* seen at Manado, northern Celebes. Paris shows the connectives as being ⊥-shaped; the bar is lashed to the float and the stem lies to one side of the boom to which its branch is lashed. This latter detail looks like a local borrowing. Müller (1912, p. 244, footnote) seems to regard the canoe just described as a Geelvink Bay vessel. He states that at Sangir, islands north of Manado, the fore and aft booms of the double outrigger canoes have a direct attachment to the double floats which occur on each side of the canoe, whereas the central booms have a ⊥-shaped connective, the bar of which is tied to the double floats. Apparently the ⊥-connective is confined to Sangir; he refers to its use at the Gazelle Peninsula at north New Ireland, and at St. Matthias.

Friederici gives the following canoe terms:

	Manokwari	Mokmer	Pom and Sirewen	Ansus	Wooi Bay
Outrigger canoe	wa (wai)	wa (wai)	wa	wa	wa
Very large canoe	tababeri	.....	.....	.....	.....
Large canoe	wai beba	.....	.....	.....	.....
Small canoe	wai kapirare	.....	.....	.....	.....
Boom	yas, yaas	yas iyas	diahi	yende	hende
Float	adi	adi	homan	woma	homa, hama
Connective	fakok	fakok	hende	yendere	hendere
End-piece	sara	sara	.....	.....	.....
Breakwater	.....	.....	ayahe	ai	.....
Tripod mast	padaren	omar (mast)	padaran	.....	padar
Mat sail	saruer, saurer	ayun	harauwi	arawui	harawui
Paddle	bores	kabores	bo	bo	bo
Bailer: coconut	obek	sobek	.....	.....	.....
Polynesian form	.....	anarim	anarem, zaru	raru	.....

NORTHWEST NEW GUINEA

On Waigiu (Waigeoe Waigeu) and Saonek, an islet near the south coast of Waigiu, there are dugouts with or without strakes and with a double outrigger. The same type is found among the Sorong (Soron) people on the island of Dom whence they removed in 1865 from Sorong, a village on the mainland near Cape Spencer (Kaap Noi). The following information is derived mainly from Friederici's account of the canoes (*wai*) of Saonek and Sorong, and from photographs by Guillemard taken in 1883.

The hull (*moref*) rises up to a slightly raised point. In the interior of the hull are transverse struts and knees (*pamai*) and longitudinal poles (*aserpar, aiserpar*) like those seen farther east at Manokwari and Ansus. The strakes are of wood and not of *gabbagabba* like those to the east. There are four, rarely three or five, straight booms (*yas*) that rest on the gunwales and are made fast within the hull to the struts and longitudinal poles; the struts are kept in position by pressing against the ridges (*fafor*) along the inside of the hull, as at Halmaheira and farther east at Manokwari and Japen. A stringer (*apianke*) crosses the booms near their ends (fig. 190). For each boom there is an obliquely-lying elbow connective (*sabako*); the elbow passes over the stringer and is tied to the boom on each side of the stringer (fig. 191, *b*); the long end is tied to the float (*adi*). Sometimes the elbow is lacking (Hornell, 1920, p. 55) so that the connective consists of a nearly straight rod (fig. 191, *c*). Friederici (1912, figs. 17, 22, 23, 27) illustrates several Indonesian varieties of the elbow attachment of the float to the booms, which he terms the "Halmaheira-Verbindung". I adopted this (1920, pp. 90, 129) as the "Halmaheran attachment", but we now term it the "elbow connective".

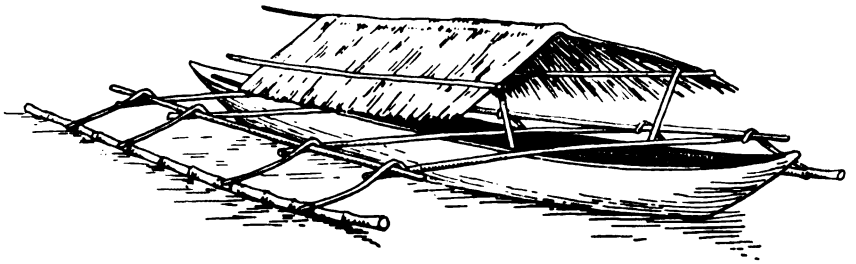


FIGURE 190.—Double-outrigger canoe with elbow connectives, Chabrol Bay, Waigiu (after Guillemard, 1889, pl. p. 373).

The *apianke* is necessarily always present, and it may be the only stringer. However, Friederici saw at Saonek a stringer nearer the end of the booms which rested on the connectives and, being lashed to them and to the booms, served to render the connectives more secure. Nearer the hull was another stringer (fig. 191, *a*). Supports, of a crescentic or other shape, are usually attached to the booms on both sides of the hull to hold on one side the unshipped mast and on the other the rolled-up sail.

The float may be of bamboo or of wood. Friederici describes the float at Sorong as being like a sledge-runner; in Tahiti fashion, it extends a long way in front of the first connective but ends shortly behind the fourth (1912, fig. 28). At Saonek he saw a float consisting of a large and a small bamboo (fig. 191, *a*).

The larger canoes have a platform with side rails and an *atap* awning (*atam*) (Friederici, 1912, p. 248; Guillemard, 1889, pl. p. 373). Hornell (1920, p. 56) says: "The double outrigger frame permits of a fairly large structure as the booms enable it to be built outboard on each side to a distance of a couple of feet. Part of the outboard cabin space is utilized for a sand-box fireplace." He adds: "Tripod masts [*padaren*] and mat sails [*sarure*] are the usual rig, but cotton sails are gradually becoming more frequent." Paddles are called *kabores*. Hornell describes two decorated ones (fig. 191, *d, e*).

Freycinet (1825, pl. 45) gives illustrations of canoes in Rawak, an island north of Waigiu:

One canoe has a high peak at the bow, which is evidently a prow-affix with the usual ball as at Manokwari; the stern ends simply. The double outrigger has four booms, each with a single stick attachment; it looks as if the connective is inserted into the float; it is tied to the side of a boom and to a stringer. The platform stretches more than halfway across the booms and an *atap* shelter is raised over the platform and hull. Another canoe with four booms and a similar attachment has end-pieces of which that at the bow is somewhat higher and more elaborate than that at the stern. On Freycinet's plate 48 is shown a small canoe which looks something like a *mon*. It has high peaks and there are two stout curved booms with a direct tied attachment. Another canoe has somewhat the appearance of the *ora* of San Cristoval, but it has three straight booms with a tied attachment; a palm leaf is shown erect amidships

to serve as a temporary sail. A third canoe, shown end-on, carries a true sail and has a double outrigger, as no doubt have all the others, but being drawn in a side view the other outrigger is not visible.

So far as I can gather, but one type of outrigger canoe extends westward from an area not far removed from Manokwari to Waigiu and thence southward to Skröe. The majority of the canoes of the island of Waigiu and neighboring islands off the northwest point of New Guinea, and doubtless those of the adjacent mainland, are entirely Indonesian in character and can be perfectly matched in a type from Weda Bay in Halmaheira (Haddon, 1920-a, fig. 6).

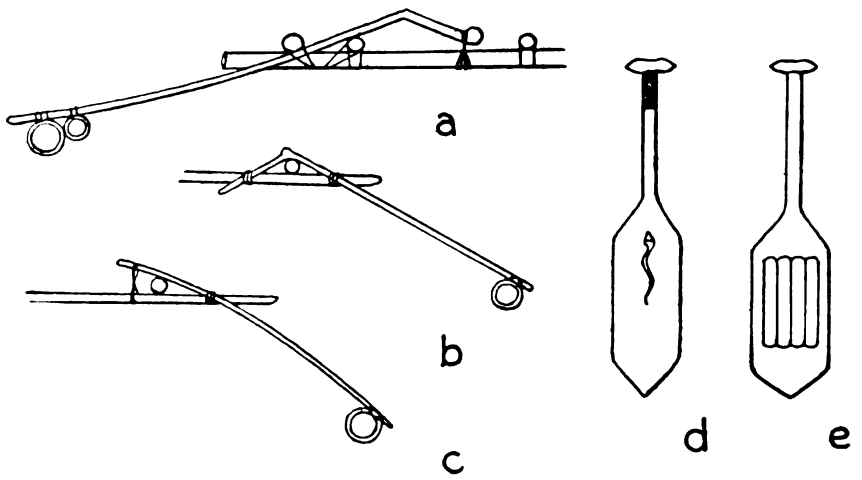


FIGURE 191.—Elbow connectives and paddles, northwest New Guinea: *a*, Saonek; *b*, *c*, Waigiu; *d*, *e*, Waigiu paddles (*a* after Friederici, 1912, fig. 30; *b-e* after Hornell, 1920, figs. 15-18).

McCLUER GULF

According to Strauch (1877, p. 30) two kinds of canoes are seen in McCluer Gulf, a large and a small; the small canoes are much more common and are used for ordinary communication, the large ones perhaps only for long voyages.

The small type of canoe (*rai*) consists of a "keel-piece" or dugout and two rows of planks, and there may be a fore or aft end-piece. The dugout which has a rounded bottom without a keel is called *tawan*, but this may be only the name for the wood. The sides are strengthened by crossbars or stretchers of which there are usually four. Small quadrangular blocks are fastened by wooden nails (*ruaf*) to the inside of the sides of the dugout opposite one another; a "swallow-tail" mortise is cut out of the upper portion of each block and the ends of the stretchers are cut into tenons so as to fit into the mortises where they are made fast by wooden nails. End-pieces of lighter and softer wood than the dugout are added to the fore and aft of the dugout in most canoes and may project well above the topstrakes. Their ends are decorated with notches, but often one or both of the end-pieces reach only to the topstrakes. In some canoes they are entirely lacking and the dugout is then higher fore and aft. There are two strakes (*sarak*) on each side; the lower strakes only are strengthened in precisely the same manner as the dugout, the added blocks of the strakes lie vertically over those of the dugout.

There is a double outrigger of which the booms (*wramar*) are laid on the topstrakes in the smaller and weaker canoes; in the larger canoes the four booms, which are usually rectangular in cross section, pass through the topstrakes and project over the sides to a distance of 1.67 to 2.33 meters; they lie exactly over the stretchers of the lower strake and of the hull, to which they are lashed. There is a stringer (*bara bara*) over the booms near their ends.

Each boom is attached to the float (*samar*) by means of a typical elbow connective (*yaman*), the short end of which is lashed to the boom over the stringer and the long end to the float. Strauch is not certain whether *samar* is the term for float or whether it is the name of the wood. There is a tree called *samar*, the bast (*kuf*) of which is used for calking [but *samar* may be merely one form of the common Austronesian term for float].

Fore and aft of the canoe is a thwart (*fafan*) which serves as a seat for paddlers. There is in many canoes a plaited reed matting on the booms near the hull which serves as a platform. Punting poles, fish spears, and other gear are laid on the booms through the triangles formed by the *yaman*, and on the booms beside the hull.

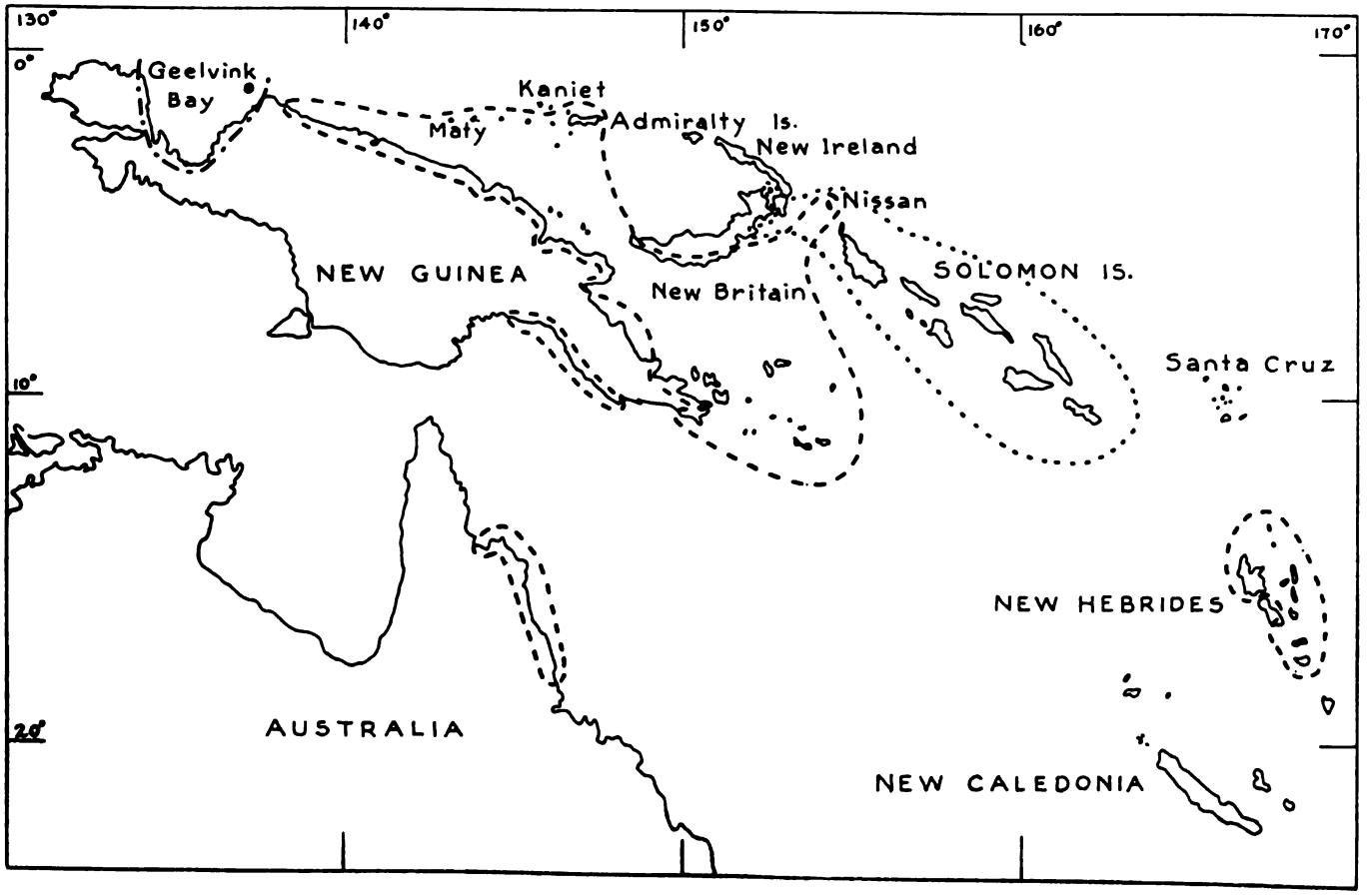
On many of the somewhat larger canoes an awning (*sanok*) is erected, and in these there is usually on each side a false boom fore of the front boom and aft of the last one; to the ends of these a stringer is lashed which is also tied to the booms and serves to strengthen the outrigger apparatus and to support the erection for the awning. The erection is a good hut open only fore and aft. When the roofing is not required it can be rolled up and laid on the booms and the framework is more or less unshipped.

Canoes of the larger type, about 6 to 8 meters long, 1.5 meters broad, and 1 meter high, are well built and stronger than the ordinary canoes. All the strakes are strengthened by stretchers in the same manner as in the smaller canoes. The canoes are propelled by short paddles (*bacssa* or *pessa*) but poles are used in smooth shallow water. Many boats carry a simple mat sail (*rar*) which seems to be used only in a favorable wind. A side view of a hull, a cross section of a canoe, and other details are illustrated by Strauch (1877, pl. 1).

According to Pflüger's photographs (1904, pp. 174, 175) a similar type of outrigger to that of Skröe is found at Sekar (Segaar) on the south shore of Telok Berow (Berou) or McCluer Gulf, on the north side of Onin Peninsula. Krieger (1899, p. 385) says the inhabitants of the island of Sekar have very high boats furnished with outriggers. At Skröe, a port founded by the Dutch in 1899 on the north shore of Telok Kampauer, the two canoes shown in Pflüger's small and rather indistinct photograph (1904, p. 171) are roomy, built-up vessels covered with an *atap* awning. The double outrigger has four booms; in one canoe the two fore and the two aft of these booms are nearer together than are the two central ones. There is an elbow connective of the Waigiu type.

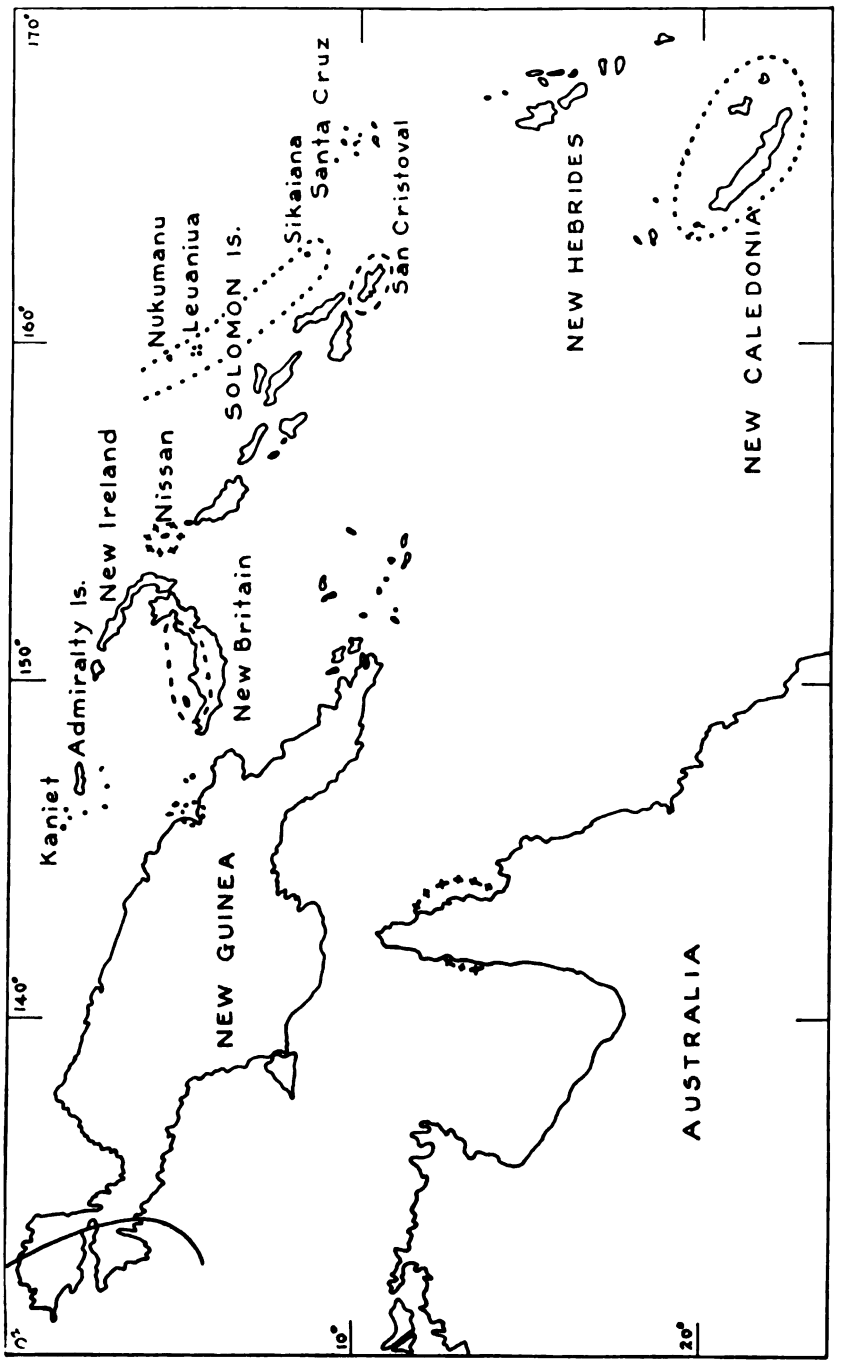
Krieger (1899, p. 385) says that at Speelmann's Bay, Telok Bitajaroe, on the west coast (135° 50′ to 134° E.) canoes to hold 12 or more persons, with a platform, mast, and quadrangular sail are bought from the Kei Islanders; these have no outriggers.

So far as I am aware, no outrigger canoes are found farther south and east of Skröe until the Torres Straits area is reached.



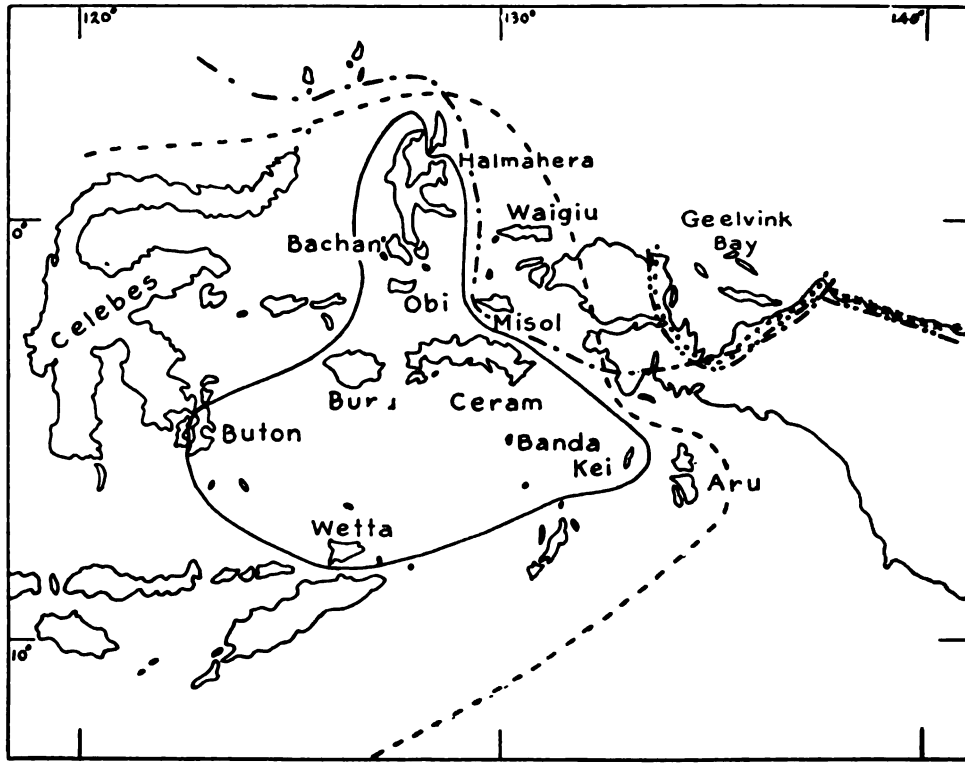
DISTRIBUTION OF OUTRIGGER ATTACHMENTS AND PLANK-BUILT CANOES WITHOUT OUTRIGGERS IN MELANESIA

— — — — — — Undercrossed pairs of stick connectives.
. . . . . Plank-built canoe without outrigger.
—·—·—·—·— Spike connective.



DISTRIBUTION OF OUTRIGGER ATTACHMENTS IN MELANESIA

++++++++ Direct attachment (distribution not exact).
— — — — — Withy connective.
. . . . . Y connective, forked or branched connective.
——— Elbow connective (an extension from Indonesia).



DISTRIBUTION OF DOUBLE AND SINGLE OUTRIGGER CANOES AND OF OUTRIGGER ATTACHMENTS IN WESTERN NEW GUINEA AND THE MOLUCCAS

—.—.—.—.—.— Double outriggers with more than two booms north of this line; double outriggers with two booms south of this line.

—..—..—..—..— Single outrigger.

— — — — — — — Elbow (Halmaheiran) connective.

. . . . . Spike connective.

———————— Withy (Moluccan) connective.

xxxxxxxxxxx Undercrossed pairs of stick connectives.

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