

ABORIGINAL NAVIGATION.*

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In the following pages I shall endeavour to briefly define the wide geographic range of the primitive kind of navigation practised among the Aborigines of Australia. An attempt will also be made to give a short description of the rudely constructed crafts employed by these people in moving about upon the water.

The subject can be better elucidated by dividing it under two heads—Canoes and Rafts. As I have travelled over the whole of New South Wales, the greater part of Victoria, and the southern portion of Queensland and South Australia, I shall be able to speak from my own personal observations in regard to them. In those regions of Australia in which I have not gathered details personally or through capable correspondents respecting the canoes and rafts, extracts will be made from the works published by early explorers, navigators and others, who had opportunities of doing so.

I shall commence with the canoes and rafts used in New South Wales and Victoria, being the most southern parts of the Australian continent. I shall then go northwards into Queensland and continue through that State to Cape York and the Gulf of Carpentaria. The sailing craft of the Northern Territory and South Australia will next be described. Then will follow the methods of navigation employed by the aborigines of Western Australia. Lastly, a brief reference will be made to the rafts used by the Tasmanians.

The most useful of Australian crafts is the bark canoe. In New South Wales and Victoria, one sheet of bark is used. In south-eastern Queensland, at Port Essington in the Northern Territory, and on the Lower Murray river in South Australia, canoes were likewise made of a single sheet of bark. In certain northern portions of Queensland, as well as in the Northern Territory, the natives employed more than one piece of bark for this purpose, and it is noteworthy that such crafts are more elaborate in their manufacture than those in use in the more southern parts of Australia, a fact which might suggest foreign influence, such as that of the Malays, at some comparatively recent period.

Capt. M. Flinders, speaking of the natives of Calydon Bay, on the western coast of the Gulf of Carpentaria, says: "It is probable they have bark canoes, though none were seen, for several trees were found stripped as if for that purpose; yet when Bungaree made them

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a present of the canoe brought from Blue Mud Bay, they expressed very little pleasure at the gift, and did not seem to know how to repair it."¹ Perhaps the Calydon Bay natives used the single-sheet canoe and were unacquainted with the making of canoes by sewing two or more pieces of bark together, such as the Blue Mud Bay vessel.

When we turn to the Rafts of our aborigines we find that they are much the same in the general principles of construction in all regions of Australia and Tasmania, where they have been reported, and the means of propulsion are substantially the same. It is also seen that rafts were employed in the same districts or side by side with canoes, except in Western Australia and Tasmania, where the latter were not in vogue.

Generally speaking, the raft affords but little protection from the water, which rises freely between the logs, but this defect is of little consequence to the rude navigators, or to their scanty and uninjurable freight. It is perhaps unnecessary to state that in all the Australian canoes and rafts which I have seen, as well as in those described by others, there is nothing to indicate the faintest notion of the use of a sail. The canoe, or its substitute the raft, is a static device, and not a dynamic mechanism.

In perusing the works of navigators and explorers in some other countries, I have not yet found any mention of canoes made from a single sheet of bark, but canoes made from two, three or more pieces have been observed in other parts of the world. The use of rafts, however, has been known among various primitive peoples far and wide over the earth, some of them not differing very much from rafts found in Australia.

Mr. Edward Palmer, in his description of canoes in Northern Queensland herein quoted, says, "The inner bark is always made to be the outside of the canoe."² Lieut. J. Henderson, in referring to some aboriginal customs in New South Wales, says: "The native strips a long sheet of bark from a stringy-bark tree. . . . The outside of the bark forms the outside of the canoe."³

In all the canoes which have come under my own observation, no matter what kind of tree they were stripped from, the rough or outer side of the bark was on the outside of the vessel. When the bark forming the canoe has been taken from a bent tree, the ends are consequently turned up, and it would be impossible to turn such a vessel inside out without splitting or cracking the bark at one or both

(1) Voyage to Terra Australis, (London, 1814), vol. ii., p. 213.

(2) Journ. Anthrop. Inst., London, vol. xiii., p. 288.

(3) Excursions and Adventures in New South Wales (London, 1851), vol. ii., p. 153.

ends, thus seriously damaging the vessel. I can speak from experience on this point, because I have made bark canoes in my youth. If the sheet of bark were stripped from a straight tree, it could be turned inside out, if there were any reason for doing so.

Although the canoe is more serviceable for many purposes than the raft, yet the latter possesses the advantage that it is not so subject to damage by accident or exposure to the sun. Bumping against a sharp rock or other obstruction may cause an injury to one of the logs or bundles of which it is made, without interfering seriously with the buoyancy of the rest of the raft. Such a mishap to a canoe might damage it beyond repair or even cause it to sink. Perhaps this is the reason that rafts are so universally used.

I would like to offer a few remarks on certain statements made by two of the early writers on the New South Wales aborigines. Dr. George Bennett, when travelling from Cullen Bullen to Dabee in the Rylstone district, saw some kurrajong trees and makes the following remark: "The wood of the kurrajong tree is used by the aborigines for boats and canoes."¹ Some years ago I was all through that district discharging my duties as a surveyor, and being aware of Dr. Bennett's statement, I made enquiry from old aborigines if ever they had made canoes out of wood, but they had never heard of such a thing. I also asked white settlers of long standing and their replies were to the same effect. I am of opinion that Dr. Bennett was told by white people that the blacks sometimes used dry logs of kurrajong and other light and buoyant woods as rafts, and that he did not differentiate between these and the real canoe.

Mr. G. F. Angas says: "Their canoes were very rude. To the southward and on the Murray river they are mere pieces of bark tied together at the ends and kept open by means of small bows of wood. Towards the north they have canoes of a more substantial character, formed of the trunks of trees, twelve or fourteen feet long; they are hollowed out by fire and afterwards trimmed into shape with the *mogo* or stone hatchet."² In 1860, I was working amongst stock on the Clarence and Nymboida, two important rivers in northern New South Wales, when the blacks were numerous and I saw them almost every day—most of them quite naked. I frequently crossed streams in bark canoes, but never heard of one cut out of a log of wood. In several parts of New South Wales, however, I have seen canoes made by white men for crossing over rivers at sheep and cattle stations. A large, hollow tree was selected and cut down.

(1) *Wanderings in New South Wales* (London, 1834), vol. i., p. 115.

(2) *Wagh's Australian Almanac for 1858* (Sydney), p. 56.

The rotten interior was burnt out and then cleaned more thoroughly with an axe. The ends were then blocked up by thin wooden slabs, securely nailed and afterwards caulked with rags or wool.

From the vagueness of the statements of both Dr. Bennett and Mr. Angas I feel confident that they never saw log canoes (or dug-outs) in use by the natives, but were misled by the careless reports of white men. It is, of course, possible that the blacks occasionally copied the white man's method of constructing a canoe, after they were supplied with iron tomahawks and axes.

The catamaran and dug-out, used by the aborigines of Cape York Peninsula, Port Darwin, and other northern portions of Australia, will not be included in this Chapter, because I do not consider them of purely Australian origin, but as introductions by the Malays and Papuans. For information regarding these the reader is referred to works on the people of the Malay Archipelago and New Guinea.

I am of opinion that the canoe made from one single sheet of bark is a purely Australian development, because I have not been able to trace its existence in any other country. The tall, clean-stemmed eucalyptus trees of Australia might readily suggest to the native mind the using of the bark for huts and canoes. Owing to the warmth of the climate, the sap is in circulation, either upwards or downwards, during a great proportion of the year, rendering the stripping or removing of the bark from the tree a simple and easy piece of work, even with such a rude implement as a stone axe.

CANOES.

The canoe is a highly valued possession among natives living in the vicinity of rivers or large sheets of deep water. On the Murrumbidgee, Lachlan, Murray, Darling, and other large rivers of New South Wales, the bark of the red gum tree, when available, is used in making canoes, a single sheet of bark being sufficient. Trees with natural curves are chosen, because canoes so obtained do not require so much labour to give them the proper shape. When the bark is stripped from the tree, while it is still soft and pliable, stretchers are placed across it at intervals of a few feet. This is done to prevent the bark from curling, while the sap is in it; short props of wood are also placed under the stem and stern to keep them from becoming too much depressed by reason of their own weight.

The vessel is then left to season for a week or two, according to the weather, and when properly dry and set it retains its shape. The length of these canoes varies from five or six feet up to as much as twice that length in exceptional cases; the width being from two to three feet. According to the size of the canoe required so is the tree

selected from which to take the bark. After the lapse of two or three years such a vessel becomes heavy and sodden, and correspondingly unwieldy, when it is found necessary to replace it with a new one.

The paddle for propelling the canoe varies in style in different districts. On the Murrumbidgee and some other places; it consist of a stick about ten or twelve feet long and two or three inches broad at the paddling end. To the other end are attached three sharp prongs about fifteen inches long, the two outside ones having barbs similar to those seen on spears, but less elaborately worked. The prongs are fastened on to the shaft with string and secured with gum which exudes from certain trees, such as the grass-tree, beefwood and others. With one end of this implement the native propels his canoe by striking the water alternately on either side, and with the other end he transfixes such fish as may come in his way. He is aware of the difference between the true and apparent position of the fish under the water, due to refraction, and aims his stroke accordingly. The paddle is made of pine wood if obtainable, or other light timber.

When fishing with a spear as just stated, the native usually stands, but if using a net or in crossing a stream, or when moving from one locality to another, he sits. In that case he uses a short paddle, resembling a tennis racket, or perhaps two such paddles, one for each hand. A small heap of clay, or a thin flat stone imbedded in earth, is placed in the bottom of the canoe between the middle and the stern, upon which a little fire is kept burning, for the two-fold purpose of keeping himself warm and of cooking some of the fish which are caught.

Another important use of the fire is to enable the native to melt the gum which he carries to repair any damage to his fishing spear. When a large fish is struck, some of the prongs may be turned out, or perhaps two or more are pressed together, owing to collision with a bony part of the animal. The fisherman puts these prongs into their right positions again. When the necessary repairs are effected he heats his supply of gum at the fire in the bottom of the canoe, and makes everything fast with it. Gum so heated was also used in repairing leakages in the craft. Still another use of the fire is to protect the occupant against supernatural agencies. A native always carries a fire-brand even when travelling upon the land.

A canoe is seldom required to carry more than two persons, as a man and his wife, or two friends. I have often seen canoes containing women only. Many of the smaller crafts cannot conveniently or safely accommodate more than one person. As these vessels are exposed to the sun or hot winds when not in use, longitudinal cracks appear in the bark, through which the water leaks. Such cracks are caulked

with clay or gum. Grass is sometimes pressed into the crack with a chisel-shaped piece of wood and this is covered over with gum to prevent leaking. When water leaks into a canoe or splashes over the side, it is bailed out with a small bark koolamin carried for the purpose. Not infrequently one of the small bark paddles is hollow on one side and is improvised as a bailer. There is generally a good deal of "pumping" required to keep the frail vessel afloat. Moreover as these canoes have no keel, but are quite round at the bottom, they are very easily overturned.

When the native gets out of his canoe he usually pulls it up on the bank, to ensure it from getting water-logged, especially in tidal water or a running stream. In placid water I have seen a canoe, not subject to leakage, tied to a sapling with a string made of kurrajong or stringy-bark fibre; the other end of the string, or "painter," was fastened to the front end of the vessel. When fishing in shallow water or near the margin, a spear or a yamstick is sometimes stuck into the muddy bottom, and the canoe fastened to it with a cord.

Stringybark and the bark of what is commonly known as the grey box tree are often used in districts where they abound. Although trees with a natural bend are preferred, they are not always available and the bark of straighter trees has to be employed. After the sheet is stripped from the tree, the ends are thinned by chopping away a little of the outer rough bark for about a foot back from the extremities, leaving only the pliable inner bark, which was heated over a smoky fire. The ends of the sheet, consisting of this prepared inner bark, were then puckered lengthwise and squeezed together, while still hot and bound round with strong string manufactured from the fibre of the kurrajong or stringybark. This binding was sometimes accomplished with a small, tough vine found growing in the scrubs. Strong cords made of tough, fibrous bark were tied across the vessel from edge to edge at two or three places to keep it from expanding outwards; and the same number of bent stretchers or ribs were placed within the canoe to keep the sides from collapsing inwards. Instead of the ribs, a cross-piece was frequently inserted from side to side, to keep the vessel in shape. In addition to the binding, some wet clay was sometimes pressed into the ends of the canoe to make it all the more water-tight.

The puckering or plaiting of the bark at the end not only gathers it in horizontally, but also has the effect of curving it upwards, so that when the lashing is completed and the vessel launched, the end is slightly higher than the sides of the canoe, and is above the water-line. It was often only necessary to fold and tie the sheet of bark at one end—the other end having an upward curve which was either

in it when stripped from the tree, or was improved by turning it up and letting it dry in that position. In such a case, the bound end always formed the stern of the craft.

The thick, stiff bark of the red gum-tree cannot be gathered and tied at the ends; if dressed down to make it thin, it would break in the plaiting or folding unless great care were exercised. Stringybark or box bark is tougher and readily lends itself to bending when warmed or steamed over a smoky fire while it is green.

On the Namoi, Macquarie, Barwon, and other rivers of New South Wales, I have seen both ends of the canoe stopped up with firm clay, which was puddled and applied in a moist state and then allowed to dry. The clay was occasionally mixed with grass or reeds, or with small tough twigs. Sometimes both ends of the canoe were blocked up with clay—sometimes only one end if the other had a natural curve upwards.

It should be explained that in stripping the bark from any kind of tree for any description of canoe, it is taken off the tree in the form of an elongated oval—that is, the top and bottom of the sheet are not cut straight across the bole of the tree, but in the shape of a horse-shoe, or the upper end of a cone.

When a native wishes to remove his canoe from the river over some intervening land to a lagoon, or from one lagoon to another, he carries it on his head. Paddle, weapons, and other belongings or spare food, may be brought along inside the canoe. If the craft be large, or is weighted with such "freight" as just described, two persons join in the portage, one at each end—generally the blackfellow and his gin.

If the owner of a canoe goes back into the hinterland where there are no lagoons or sheets of water, he hides his vessel in a patch of scrub near the river bank and covers it with bushes to protect it from the sun till his return.

I have already said that owing to the primitive structure of these frail crafts they capsize very readily. The occupant has to exercise continual care to prevent overturning. On this account when entering the canoe the native steps lightly into the middle of it, balancing his body like a man walking on a tight rope. If he intends to remain standing, he strikes the water first on one side and then on the other with a long pole. If the water is shallow he places the lower end of the pole on the bottom and shoves his craft along.

If he considers a sitting posture would suit his purpose best, he squats down with his heels doubled under him and his knees resting against the sides of the canoe. He catches his paddling pole by the centre and dips in it the water alternately on each side. Or perhaps he improvises his wommera or a spear as a paddle, striking the water

on alternate sides. The use of small bark paddles has been explained in an earlier paragraph. Sometimes the man kneels on a pad of leaves or grass or soft bark, which he has placed on the bottom of the vessel for that purpose. If two persons are in the canoe, one sits as near the stern as possible without the water slopping in. The other person sits or stands well forward, but leaving the prow a little higher out of the water than the stern. The fire already referred to is between the two. If there is a ripple on the water, caused by the wind or the current, both the voyagers sway their bodies slightly, according to the rolling of the vessel, so as to avert its upsetting. The vessel is steered athwart the direction of the wind or stream, and is borne over the crest of the waves sidewise, recalling the easy movement of a seagull. If the canoe has but one occupant, he sits or stands in the centre, with the fire between him and the stern. Personal effects, fish and other impedimenta, are distributed in the craft in such manner as not to disturb the balance. But as a rule, nothing unnecessary is carried.

When two men, or a man and his wife, go out fishing in a canoe at night, one of them waves a burning stick held in the hand, the blaze of which attracts the fish, which are then speared by the man on the look out for them. If the fishing was carried on in deep water close to the shore, a fire was lit on the land near the edge of the water, to allure the fish to the spot. In fishing operations, the person sitting in the rear of the canoe does most of the paddling, leaving the other free to watch for the fish.

Bark cannot be stripped from trees at all times, but only at those seasons of the year when the sap is in circulation, either going up or coming down the bole. But there is considerable irregularity in the time when this occurs. In good or normal years the sap ascends in the early spring; in times of drought it is much later. But even in the same forest under similar conditions of weather, the sap circulates in some trees more freely than in others, even when of the same species; young healthy trees and those growing in favourable localities being earlier than the rest. On this account, when a blackfellow has found a tree from which a suitable sheet of bark could be obtained for a canoe, he first of all cuts with his tomahawk through the bark into the wood in two places, one about a handbreadth immediately below and parallel with the other, each cut being horizontal and about three inches long. He then makes a vertical cut at each side of those already made, and tries to prise off the bark with his tomahawk or piece of sharpened wood. If this small section of bark comes off easily, it shows that the sap is circulating and the man proceeds with stripping off the material for his canoe; if not, he tries other trees in the same way.

It may be stated, that a tree whose bole is free from knots, grub-holes, or other blemishes is always looked for.

Having given the results of my own personal investigations, I will now make a few short extracts from the works of other authors in the early days of the occupation of Australia. These extracts will be confined to those parts of the continent which are not already touched upon in this work.

J. Macgillivray describes some aboriginal canoes which he saw in Rockingham Bay, on the north-east coast of Queensland, where the town of Cardwell has since been built. He says: "Their canoes are very rudely constructed of a single sheet of bark of the gum tree, brought together at the ends and secured by stitching. The sitter squats down with his legs doubled under him, and uses a small, square piece of bark in each hand as paddles, with one of which he also bails the water out, by dexterously scooping it up from behind him. . . . There were eight canoes, four of which carried two men, and the others one man each."¹

Capt. P. P. King refers to canoes in the same locality: "The canoes were not more than five feet long and generally too small for two people. Two small strips of bark, five or six inches square, serve the double purpose of paddling and for bailing the water out, which they are constantly obliged to do to prevent their canoe from sinking. In shoal waters the paddles are superseded by a pole, by which this fragile barque is propelled."²

Speaking of the natives of Cape York Peninsula and the Gulf of Carpentaria, Mr. E. Palmer says: "Canoes are only found among the coast tribes, where they are much used in the calm waters inside the Barrier Reef and among the islands of the Gulf of Carpentaria. They are formed of three separate sheets of bark, cleaned of the outer rough covering, pointed at each end, and bored with holes along the edge for sewing together. One sheet forms the bottom, the other two making the sides and the ends. A piece of filling or roll of grass is sewn in between the edges, to strengthen and fill up the seams. The inner bark is always made to be the outside of the canoe. A rim is sewn of tough vines around the gunwale to add stiffness and strength, while a cord across the centre keeps it from spreading, and a piece of wood at either end to keep it apart. Such a canoe is capable of carrying four or five persons and can be used in a moderate sea.

(1) Narrative of the Voyage of H. M. S. "Rattlesnake," in 1846 to 1850 (London, 1852), vol. i., p. 81.

(2) Narrative of a Survey of the Intertropical Western Coasts of Australia (London, 1827), vol. i., p. 202.

The blacks bail the water out with a large shell, and broad paddles four feet long are used."¹

Capt. M. Flinders mentions a canoe he saw at Blue Mud Bay, off the mouth of the Walker River, on the western shore of the Gulf of Carpentaria, in the Northern Territory: "The canoe was of bark, but not of one piece as at Port Jackson. It consisted of two pieces, sewed together lengthwise, with the seam on one side; the two ends were also sewn up and made tight with gum. Along each gunwale was lashed a small pole; and these were spanned together in five places with creeping vines, to preserve the shape and strengthen the canoe. Its length was thirteen and a half feet and the breadth two and a half feet, and it seemed capable of carrying six people, being larger than those at Port Jackson."²

Capt. P. P. King found canoes at Port Essington, Northern Territory, one of which he describes: "The canoe measured eighteen feet in length by two feet in width and would easily hold eight persons. The sides were supported by two poles fastened to the gunwale by strips of a climbing plant, *flagellaria indica*, that grows abundantly hereabouts, and with which also the ends of the canoe were neatly and even tastefully joined. The poles were spanned together on either side by ropes constructed of strips of bark. The canoe was made of one sheet of bark. But in the bottom, within it, short pieces were placed crosswise in order to preserve its shape and increase the strength. The canoe was secured to the beach by a small rope."³

Mr. W. H. Willshire reports seeing a blackfellow and his lubra (wife) crossing a large lagoon, dotted with red lilies, in a very frail canoe.⁴ This was in the valley of the Victoria river, Northern Territory, and although he does not mention the exact locality, the context shows that it was somewhere between the Gregory and the Gordon, tributaries of that river. The material of which the canoe was made is not stated.

Rev. George Taplin, in describing the customs of the Narrinyeri tribe at Lake Alexandrina, South Australia, says: "They make canoes of the bark of the red gum tree, stripped off in large sheets. These sheets are laid on the ground and the sides and ends encouraged to curl up to the proper shape while it is drying by being tied with cords strained from side to side and end to end, and stones are placed in the bottom. But these bark canoes, although handy when new, soon

(1) Journ. Anthropol. Inst., vol. xiii., p. 288.

(2) Voyage to Terra Australis (London, 1814), vol. ii., p. 198.

(3) Narrative of a Survey of the Intertropical Western Coasts of Australia, London, 1827, vol. i., pp. 89-90.

(4) The Land of the Dawning (Adelaide, 1896), pp. 48-49.

get sodden and break. They seldom last more than twelve months. . . . A man will stand in a canoe silently watching with uplifted spear, until a fish comes beneath, when the weapon is darted down on its back, and it is lifted transfixed from the water."¹

On the Lower Murray, above Lake Alexandrina, Mr. T. H. James "found a canoe made fast to a stake driven into the mud. It consisted of a single sheet of thin bark. Towards the stern was the remains of a fire."²

I have been in communication with a large number of station owners, miners and others in Western Australia respecting the customs of the aborigines generally, but I have not yet been able to obtain any information as to the use of canoes in that State. Mr. Thomas Muir, of Deeside Station is a very old resident of Western Australia, and is well acquainted with the coast from Perth to Eucla. He informs me he is quite certain that no canoes were used by the natives of that region.

Dr. Scott Nind was medical officer at King George's Sound, now called Albany, Western Australia, from 1827 to 1829. In describing the customs of the natives of that district he says they had no canoes.³

Lieut.-Col. Collins, speaking of the natives of the Derwent river, Tasmania, says: "No canoes were ever seen, nor any tree so barked as to answer that purpose; and yet all the islands in Frederick Henry Bay had evidently been visited." These islands were no doubt visited by means of rafts and floats, which we shall see presently were used by the Tasmanians.⁴

RAFTS AND FLOATS.

On most of the larger rivers of Australia, as well as in the bays on the sea-coast, the use of rafts or floats was known to the aborigines. On the Shoalhaven and other rivers on the south-east coast of New South Wales, the stem of the cabbage-tree, a light and pithy wood, was employed for making rafts. Generally two, but occasionally three, dry logs of this tree, from fifteen to twenty feet in length, selected for straightness and uniformity in size, were lashed together with ropes made of stringybark fibre or vines, and were capable of supporting the weight of one or two persons in crossing stretches of water or in going from place to place along the river. A bunch of the leaves of the tree were fastened on top as a sitting place. They were propelled by means of a paddle, similar to those used for canoes.

(1) The Narrinyeri Tribe (Adelaide, 1874), pp. 29-30.

(2) Six Months in South Australia (London, 1838), p. 232.

(3) Journ. Roy. Geog. Soc., London, vol. i., p. 32.

(4) Account of the English Colony in New South Wales (London, 1802), vol. ii., p. 188.

Sometimes the native stood, with a foot on each log and used a long pole with which he struck the water on each side in succession. In shallow water he pushed his craft along by pressing the pole on the bottom. I have occasionally seen youths using a single dry log, on which they sat straddle-legs with their feet in the water, paddling along with their hands or with a piece of bark. Rafts were similarly made of dried stems of the bungalow tree, three or four being fastened together, with the butts at the same end.

On the Hunter and some other streams of the north-east coast of New South Wales, stems or branches of the kurrajong, another light and buoyant wood, were used instead of the cabbage-tree, and in the same way. On the Lower Lachlan, Murrumbidgee, and Murray rivers, where large reeds grow in abundance, they were used when dry for making rafts, in the following manner. Bundles of these reeds were lashed together with string and then three or four bundles were treated as the logs above described, by fastening them together with stronger ropes. The rafts were used in going out on large sheets of water for the purpose of spearing fish. A place was made of weeds or grass, covered with damp earth, on which a small fire was kept burning. In the Clarence river district I once saw a raft made of the branches of the mangrove tree, which had been cut and allowed to dry in the sun until quite light, when they were bound together so as to support one man, who stood and paddled with a long wooden spear. An old resident of the Manning river, who had roamed about with the blacks a good deal in his youth, told me he had seen dry pine logs used in a similar way.

It was not uncommon for a native to use a dry buoyant log, alongside of which he swam, resting one arm at a time by throwing it over the log. I have also occasionally seen natives swimming alongside one of their rafts, shoving them through the water from one side of a lagoon to the other. Sometimes a piece of bark was laid flat on top of the raft, upon which the navigators placed their belongings.

The late Mr. Edward Palmer, who once owned some large stations in North Queensland, told me he had frequently seen rafts in use on the Mitchell, Palmer, and Saxby rivers, which flow into the Gulf of Carpentaria. They were made of dry logs of a very light wood known in that district as the quandong tree, fastened together by means of cross-pieces and vines. He said he also saw rafts consisting of dried mangrove branches, or bundles of palm-fronds, or other buoyant material. They were mostly wide at one end and smaller at the other. In some instances the native lay full length on the raft and propelled it with his hands.

One of my sons resided some years in the northern parts of Queensland and was well acquainted with the Burdekin and Johnston rivers, on both of which he occasionally saw natives using rafts. When at Normanton in the Gulf Country, the aborigines told him that canoes and rafts were in use among them. From what my son said I felt satisfied that the main features of the construction of the rafts were similar to what I had myself seen elsewhere.

It will be interesting to briefly mention a few of the rafts reported by early writers in portions of Australia not reached by my own investigations, in order to show their geographic distribution.

Allen's Island is close to the south-western shore of the Gulf of Carpentaria and belongs to the State of Queensland. It is situated between Pt. Parker on the mainland and Bentinck Island, and is one of the Wellesley group. Capt. M. Flinders thus reports some rafts which were seen by him on Allen's Island: "The rafts consisted of some straight branches of mangrove, very much dried, and lashed together in two places with the largest ends one way, so as to make a broad part, and the smaller ends closing to a point. Near the broad end was a bunch of grass, where the man sits to paddle; but the raft, with his weight alone, must swim very deep, and indeed I should have scarcely supposed it could float at all. Upon one of the rafts was a short net which from the size of the meshes was probably intended to catch turtle; upon another raft was a young shark."¹

Capt. J. L. Stokes describes a raft which he saw near Bathurst Island, in the extreme north of the Northern Territory. "It was formed of the dead trunk of a mangrove tree, with three distinct stems growing from one root, about eighteen feet long and four and a half wide. The roots at one end closely entwined, as is the habit of that tree, formed a sufficient bulwark at the stem, while an elbow in the centre of the trunk served the same purpose at the stern. A platform of small poles, well covered with dry grass, gave sufficient flooring to this crude craft."² Capt. Stokes saw a man paddling a raft with a short spear, sharp at each end, and struck the water alternately on either side."

At Paterson Bay, near Port Darwin, Northern Territory, Capt. Stokes observed a raft on which were two women with several children, whilst four or five men were swimming alongside, towing and supporting themselves by means of a log of wood across their chest. The raft itself was quite a rude affair, being formed of small bundles

(1) *A Voyage to Terra Australis* (London, 1814), vol. ii., p. 137.

(2) *Discoveries in Australia*, i., pp. 173 and 175.

of wood lashed together, without any shape or form, quite different from any we had seen before."¹

At Hanover Bay, on the north-west coast of Western Australia, into which the Prince Regent river empties, Capt. P. P. King reports a raft. "It consisted of five mangrove stems lashed together to a frame of smaller wood. These rafts are buoyant enough to carry two natives, besides their spears and baskets."²

On the north-west coast of Western Australia, Capt. J. L. Stokes found a raft on the south side of Roe's Group. "It was formed of nine small poles pegged together and measured ten feet in length by four in breadth; the greatest diameter of the largest pole was three inches. All the poles were of the palm-tree, a wood so light that one man could carry the whole affair with ease. By it there was a very rude double-bladed paddle."³

When exploring in the vicinity of Mermaid Strait and Nickol Bay, on the north-west coast of Western Australia in 1861, Mr. F. T. Gregory states: "Our ship was visited by two natives, who had paddled off on logs of wood, shaped like canoes, not hollowed but very buoyant, about seven feet long and one foot thick, which they propelled with their hands only—their legs resting on a little rail made of small sticks driven in on each side. . . . It was not far from this spot that Capt. P. P. King had a visit from natives similarly equipped more than forty years ago."⁴ Capt. P. P. King says that at Rosemary Island he saw three natives seated each on a log of wood, which he propelled through the water by paddling with his hands.⁵ This is the incident referred to by Mr. Gregory.

Mr. Robert Austin, during an exploring expedition in Western Australia, saw a raft at the south entrance of the Gascoyne river into the sea. It consisted of a light log of white wood, eleven feet long and ten inches in diameter. As the raft was found among some drift timber, Mr. Austin inferred that it had been brought down the Gascoyne from the interior by floods. This raft was presented to the public museum at Perth, Western Australia.⁶

Mr. E. T. Hardman, the geologist attached to the Kimberley Surveying Expedition, Western Australia, in 1883-4, contributed a paper

(1) Discoveries in Australia, vol. ii., pp. 15-16.

(2) Narrative of a Survey of the Intertropical Western Coasts of Australia (London, 1827), vol. ii. p. 69.

(3) Discoveries in Australia (London, 1846), vol. i., p. 115.

(4) Journals of Australian Explorations, p. 156.

(5) *Op. cit.* vol. i., p. 38.

(6) Journ. Roy. Geog. Soc. London, vol. xxv. p. 271.

to the Royal Irish Academy¹ in which he states : " Spears are generally used in taking fish. The native constructs a rude raft of logs, on which he ventures into a deep pool where fish are plenty. He has in one hand a piece of twine to which is attached a bait. The fish, attracted by this comes up to nibble at it and while its attention is engaged by the lure, the native promptly spears it."

From the mouth of the Gascoyne river southerly to King George's Sound and onward easterly to Port Lincoln I have been unable to learn that rafts were ever in use among the natives. The present aborigines, as well as the early white settlers inform my correspondents that there were neither canoes nor rafts along that stretch of coast. I am also unable to find a report of the use of either of these forms of craft in the works of any other author. I hope that some one who has opportunities will make further inquiries.

Mr. R. B. Smyth, speaking of navigation among the natives of Tasmania, gives the following quotation from Mr. Dove's work : " The contiguous islands of the Straits were frequently visited by the tribes located on the northern coasts of Tasmania. A species of bark or decayed wood, whose specific gravity appears to be similar to that of cork, provided them with the means of constructing canoes (rafts). The beams or logs were fastened together by the help of rushes or thongs of skin. These canoes resembled, both in shape and mode by which they were impelled and steered, the more elegant models in use among the Indians of America. Their peculiar buoyancy secured them effectually against the usual hazards of the sea."²

Lieut. Jeffreys, referring to the aboriginal inhabitants of Tasmania, says : " When, during their excursions in the autumn, which were supposed to be from west to east, and in the spring from east to west, they came to an arm of the sea, or a large river, or a lake, they made a kind of raft, which was formed of the trunks of two trees, about thirty feet in length and laid parallel to one another at a distance of five or six feet. The logs were kept together by four or five lesser pieces of wood, laid across at the ends and fastened by slips of tough bark. In the middle was a cross timber of considerable thickness, and the whole was interwoven with a kind of wicker-work. This flat and completely open raft, or rather float, was made to skim along the surface of the water by means of paddles, with amazing rapidity and safety. The natives were frequently seen on them near the southern mouth of the Derwent river, between Bruny Island and the mainland, where the rafts were often found deserted by their owners."³

(1) Proc. Roy. Irish Acad., Series 3. vol. i., p. 62.

(2) The Aborigines of Victoria, vol. ii., p. 401.

(3) Van Dieman's Land (London, 1826), pp. 127-128.

Speaking of the aborigines of Macquarie Harbour, on the western coast of Tasmania, Mr. J. Backhouse says: "They cross the mouth of the harbour on floats in the form of a boat, made of bundles of the paper-like bark of the swamp tea-tree, lashed side by side by means of tough grass. On these three or four persons are placed and one swims on each side, holding it with one hand."¹

Rev. J. West speaks of a raft found by La Billardiere in Adventure Bay, Bruni Island, on the southern coast of Tasmania. It was made of pieces of bark and held together by cords made of grass and assumed the appearance of meshes worked in the form of a pentagon.²

An interesting feature in connection with Australian rafts and floats, revealed in the preceding pages, consists in the fact that at Paterson Bay near the extreme north of the Northern Territory, rafts were sometimes towed by men swimming alongside. At Macquarie Harbour, on the western coast of Tasmania, a man swam on each side of the raft, towing it with one hand each. In the Northern Territory, as well as in Tasmania, rafts were also propelled by paddles. In both the localities mentioned we have seen that some rafts were made of bundles of wood or bark lashed together, whilst others consisted of two or three logs of wood on which cross pieces were fastened. These places are separated by about thirty degrees of latitude, or eighteen hundred geographical miles.

(1) *Narrative of a Visit to the Australian Colonies* (London, 1843), p. 58

(2) *History of Tasmania* (Launceston, 1852), vol. ii., p. 77.a