Ceremonies observed at launching a new canoe,
Abaian.

At the point of dawn, the new canoe is carried
from its shed by the builder and his
helpers, and laid out on the shore,
pointing East and West, with outrigger to the
windward side.
If the tide is out, the keel of the canoe is
supported on several green, unhusked
coconuts; if tide is high, she merely floats.
The fan-shaped ends of coconut leaves are
then laid (one each) on the stem, stern
and outrigger of the craft so that their
tips are pointing outwards and overhang
the water. These are to frighten away
the evil spirits and fish that might do
her harm. Upon the leaves are laid
green coconuts, balai, and any other sorts of
native food available, in small quantities.
These constitute the food of the evil spirits
(a sort of sop to Cerberus) to divert their
attention from the canoe itself.
While these various objects are being laid
on the craft, incantations of the usual
sort are muttered, the performers of
the ceremony facing eastward.
This done, the canoe is left to lie
until just before sunset, at the same
day. At this hour, the same company proceeds to the canoe, and throws all the food placed therein into the sea; the coconut leaves are also cast away. These are supposed to drift away into the mouths of the various spirits and fishes that might do the craft injury; they act as a peace offering.

The canoe is then lifted out of the water and carried ashore. She is set down pointing East and West in a space prepared for her by the lagoon shore. A large fire is then built near her stem which points to the lagoon—or if her orientation happens to bring her parallel to the lagoon shore, it is lit at her Western end, i.e., the end nearest the sitting stem. Coconuts and food are placed, while the fire is burning. Inside her hull: at both stems and amidships, under the outrigger beams. The food is to placate, and the fire to frighten away the unfriendly spirits that inhabit the canoe. "Talnia-mi-kali" (the Frequentor of the Keel) and other such names are attributed to these spirits. The idea in the native mind is explicitly that the canoe is, as it were, "born in air"; it is the natural home of soil spirits and must be purged of these by
fire before it is fit to do its work, or 
safe for human use.

While the fire is burning itself out, 
a feast is started, of which not only 
the builders, but also their relations 
partake. The canoe is then left 
overnight, with its food inside.

Next morning, at sunrise, the 
builders again carry the craft to 
water. The mast is set up to one 
chain; her sail is hoisted to another; 
her steering oar is lashed into 
place to a thud; her fire and aft 
mast stays are adjusted to a foresail; 
and so on.

The canoe is then ready for its work.
Certain terms were used to describe the appearance of the land from a canoe. The general term for landfall was Ke Muri. There were four sorts of Muri:

(a) Ke Bondo, i.e. the closed: descriptive of the trees, which when seen from close, where they form an unbroken line;

(b) Ke Rawarawa, the interspaced: when more distant, the smaller trees disappear, leaving gaps between those still visible;

(c) Ke Burubura, the semislender: when first visible, sitting on canoe;

(d) Ke Eko-marina, the disappearing: when only visible from the crest of a wave.
Navigation.

There were certain traditional signs by which navigators judged their distance westward of the land. The safety limit to leeward (i.e. westward in the trade season) was called the "fish wall of Kabaki". (See story of Kabaki in the tale of Nu Māngarembuka). It consisted of a line of leaves and rubbish scattered over the sea from Makin to Samoa, far to westward of the land. This is possibly quite true, the rubbish being carried by some current.

The sea was said to slope sharply down to westward (taliteremo) beyond this limit, and return was difficult. If a craft fell away further to leeward, it came eventually to the second limit (toki), which was a region of āriki, a dead calm. The frequenter of these waters was a gigantic fish called Tikiri, which sucked canoes and occupants into its mouth and swallowed them whole.

The third toki, farther west again, was called Wane-n-anti (shooting star of the spirits). In this place a man had two shadows. If he looked at his sail, his shadow was there; and if he looked at the water, his shadow was there too.

The fourth toki was recognised by the appearance of a bird whose cry was continually "I a Kaawa, I a Kaawa!" (I am unfortunate, I am unfortunate). And in this place it was hopeless to think of a return, for the sea sloped sharper still to westward and the waves rushed like a river (Marama) downward.
The fifth and last tone was called the Habuki-te (the somersault). Any craft coming so far was then doomed. The water rose in confused waves, with no direction, all around it, and it was sucked down into the depths.
Navigation.

In reckoning his daily position at sea, while travelling from island to island, the navigator had certain "betta", or landmarks, which helped him to find his bearing. The knowledge of these betta was no doubt the cumulative result of many years of travelling. I have been able to find out 19 recognised betta.

1. If the navigator came to a place where 27 waves in succession seemed to rise as if from under the sea and travel past him from North to South, no matter what was the general direction of the swell, he knew that he was half a day's sail due north of Makin.

2. Farther north than this he would find that the prevailing wind was N.E. instead of S.E. (in the season of Trade) and would know that to reach Makin he must return on his tracks.

3. If the N.E. wind failed to warn him, he knew that farther still to northward there lay a belt of macluba, mist or low visibility, to tell him that he had overshot his landfall.

4. If in trying to make Pentaritari he hailed his vessel too close (in S.S. Trade) the betta known as the Kainiman would warn him that he was to eastward of his landfall. The Kainiman
was recognized by its numerous sharks, and especially by the shark known as Ngaree, which has but one row of teeth in each jaw. Another name for this betia was Omi-baken (influence of sharks).

5. To eastward of Makin also lay a Kainman, or Omi-baken, and an additional guide to the navigator was the presence of large numbers of Proper Birds (Red Tailed).

6. A sign that a man was to N.S. of Makin by a day's sail was the appearance of many sharks of the variety called Baiburetane (spotted-fin). The tips of two shark's fins are touched with a yellowish white.

7. South-west of Makin lay the betia where flying-fish were observed to leap frequently in pairs from the sea, and fly one just under the other.

8. Due east of a middle point between Marakei and Makin was known to lie the islet named Bi'a-mi-Karakara. This islet is uninhabited and uncharted, but it is known by European navigators to lie some sixty miles to eastward of these two islands.

9. To westward of Abarang, half a day's sail, was a betia recognized by the presence of numerous jelly-fish called "Wain Nekkeau" (name of Na'Areau).
10. A man knew he was nearly in sight of the north end of Atiaiang, but farther away to leeward (westward) when he saw a flock of seagulls which flew in pairs, the birds continually revolving one about the other.

11. Farther to westward of Atiaiang & Tarawau, a navigator would know that he was a day's sail from land by meeting with a very large variety of porpoise, said to be 4 fathoms long.

12. West of Tamana was the bethai called 'U Ara Bunega. It is said that this was known by the presence of oily streaks on the sea's surface, having two arms, thus >. One of these arms invariably pointed to Tamana, the other to Taritinaa.

13. Just out of sight of land, to south of Manakei was Nei Rōboa: a large wave, or series of large waves travelling northwards with curling crests, as it tends to break.

14. Due south of Nei Rōboa was Te Kio, a series of large waves travelling northward, not breaking but with troubled flanks.

15. North east of Tamana, half a day's sail, was known to be a series of waves similar to Nei Rōboa (13) but travelling always across the swell, southeastward. This
15. Between Tarawa and Mariana were porpoises in pairs, whose heads always pointed in the direction of the passage into Tarawa lagoon at the place called Bairiki. (It is quite probable that these porpoises would be feeding on some sort of food swept out of Bairiki passage by the tide race of the lagoon at falling water.)

16. A beta to the west of Mariana, just out of sight of land was a submerged reef, some six fathoms below the surface. This reef is said by old navigators to stretch S.W. to the southern point of Aranuka, some 60 miles away. It is a haunt of porpoise.

17. Far to westward of Aranuaka, half a day's sail from Baranaka (Ocean Island) is the beta named Kaihā'ā: there, the waves are seen to sweep from N. to S. across the prevailing swell.

18. Eastward of Kusaie (Kurae, Gill) is the fish called Makenni-Kusaie (esp. gasfish) which leaps in great numbers from the sea. Farther to eastward still, two days' sail from land are seen turtles in pairs, one of which jumps from the sea when approached, while the other dives.

19. "Beyond all lands" is the land called Mataaka.
Terms for Landfall

Certain terms were used to describe the appearance of the land from a canoe. The general term for landfall was te Mui. There were four kinds of mui:

(a) Te Bono (the closed): descriptive of the trees, which, when seen from close inshore, form an unbroken line.

(b) Te Rawarawa (the interspaced): when more distant, the smaller trees disappear, leaving gaps between those still visible.

(c) Te Burabura (the similitude): when just visible, sitting on a canoe.

(d) Te Eko-mauna (the disappearing): when only visible from the crest of a wave.
Seamarks (botia)

As Europeans use landmarks, so the Gilbertese ancestors relied upon seamarks (botia) to check their daily position. These signposts in mid-ocean consisted of swarms of fish, flocks of birds, groups of driftwood, or conditions of wave and sky, discovered — and once discovered never forgotten — to be peculiar to certain zones of the sea. Hundreds of such traditional botia were stored up in the race memory as a result of the cumulative experience of generations. It is difficult for us to appreciate how very concrete and significant to the native mariner were the signs of sea and sky which to us seem so precarious. The people had, in fact, a sea-sense which we do not possess in anything like the same degree, and it was obviously this gift more than any other agency which guided their migrant ancestors safe to land across a vast and strange ocean where their star-slore could no longer serve them.

The following tabulated list of botia bears mostly upon conditions of travel between island and island of the Gilbert Group, and should be read from the viewpoint of a navigator whose home port was Butaritari, in the extreme North of Gilbert; but though thus local in their application, they do serve to suggest the bold technique, the shrewd observation, which enabled the ancestors to undertake voyages of immensely greater duration.
If the navigator, Northward bound during the season of S.E. trade-winds, overshoots Butaritari or Little Makin, he will come to a zone of ocean where a series of 27 waves rises from time to time as if under the sea; and travels past him from N. to S. across any prevailing swells. From this, he will know that Little Makin is half a day’s sail to Southward.

Further North than the 27 waves, the trade-wind will be found to change from S.E. to W.N.E. This warns the mariner that he is not less than two days’ sail to North of Little Makin.

Further still to Northward, the voyager runs into a belt of low visibility which indicates that he is in the latitude of Tarutu — i.e., Jaluit Island, E. Marshall’s, about 250 miles N.W. of Little Makin, and must run West for two or three days before he can make land.

This belt is a zone of the sea to Eastward of Butaritari, a day’s sail down wind to land; it is recognized by the presence of extraordinary numbers of the shark called te naaree — a much dreaded variety of the Grey Nurse family. Another name for the region is te otxi-halten (The enclosure of sharks).

A second otxi-halten is recognized by the sailor to Eastward of Little Makin, half a day’s sail offshore. This belt is distinguished from the preceding one by its numerous Red-Tailed Tropic-Birds (Phaeton rubricauda).

To E. of Little Makin, a day’s sail from land, is a zone of sea teeming with the species of shark called beisbre, the tips of whose fins are touched with ivory-white markings.

S.W. of Little Makin, due W. of Abaian, and N.W. of Malana, the navigator recognizes a region where the flying fish habitually leap in pairs from the sea, flying one just below the other and ultimately plunging together back into the waves.

Due East of a middle point between Marakei and Little Makin the navigator knows of a small sandy islet, which he calls Bikelin-karakea. (The existence of this tiny uncharted island, about 60 miles to Eastward of the two islands named, is confirmed by European master-mariners.)

A belt is a zone frequented by immemorial jelly-fish of the sort called waen Ha Aread.
Eastward of Kussake (called Kurae in the Gilberts) is the fish called Makani Karawa (garfish), which leaps in great numbers from the sea. Further to eastward still, two days sail from land, are seen turtles in pairs, one of which jumps from the sea when approached, while the other dives.
The traveller knows that he is nearly in sight of the North end of Abaima, but has fallen away to Westward, when he sees numerous terns flying in pairs, of which one bird continually revolves about the other.

Farther to Westward than the sea-birds, a day's beat away from land, is recognized a region frequented by schools of a large variety of porpoise (possibly black-fish), each one four fathoms long.

Due South of Harakei, just out of sight of land, is encountered Nei Roba - a large periodical wave, travelling due North across any prevailing swell, with curling crest as if ready to break.

Half a day's sail farther South than Nei Roba, the traveller runs into Te Kia - a series of large waves also passing North across the swell. These waves are not crested, but have troubled flanks.

Far to Westward of Abaima, half a day's sail down wind to Ocean-Island (Banaba), is found Te Kiu-kah-bata - a frequent succession of large waves sweeping from North to South across the swell. (This betia is estimated to lie about 300 miles distant from the Butaritari navigator's home).

The sea-mark known as Te ari-bunce is called the or safeiy line, it is described as a succession of shining streaks upon the sea's surface forming a great V-shaped figure. One arm of the V is said to point towards Tanana, the other towards Tabiteuea. The season of trade winds is here postulated as elsewhere. (The island of Tanana lies about 350 miles distant from Butaritari).

This betia consists of a scattered line of leaves and other drift far to Westward of Ocean-Island (Banaba), which stretches from the line of Northern Islands (Carolines) in a SWly direction towards Tanana. It is said that by following this line a navigator could reach as far South as Tanana, but would find great difficulty in beating up to land from the point where the drift began to fail him.

For purposes of local navigation, the Nei Roba is called the tol, or safety limit, to Westward.
Between Tarawa and Maiana were porpoises in pairs, whose heads always pointed in the direction of the passage into Tarawa lagoon at the place called Bairiki. (It is quite possible that these porpoises would be feeding on some sort of food swept out of Bairiki passage by the tide race of the lagoon at falling water).

A betia to the west of Maiana, just out of sight of land, was a submerged reef, some six fathoms below the surface. This reef is said by old navigators to stretch south-west to the southern point of Aranuka, some sixty miles away. It is a haunt of porpoises.
There were certain traditional signs by which navigators judged their distance westward of the land. The safety limit to leeward (i.e. westward in the season of the Trade winds) was called the 'fish-kill of Kabaki' (see the story of Kabaki in the tradition of Nei Mangaririka). It consisted of a line of leaves and rubbish scattered over the sea from Makin to Samoa, far to the westward of the land. This is possibly quite true, the rubbish being carried by some current.

The sea was said to slope sharply down to westward (batete rio) beyond this limit, and return was difficult. If a craft fell away farther to leeward it came eventually to a second limit (toki), which was a region of ariki, or dead calm. The frequenter of these waters was a gigantic fish called Te Uu, which sucked canoes and their occupants into its mouth and swallowed them whole.

The third toki, farther west again, was called Wene Anti (shooting star of spirits). In this place a man had two shadows. If he looked at his sail his shadow was there, and if he looked at the water his shadow was there too.

The fourth toki was recognised by the appearance of a bird whose cry was continually 'I a kawa, I a kawa' (I am unhappy, I am unhappy). And in this place it was hopeless to think of a return, for the sea sloped sharper still to westward and the waves rushed like a river (karanga) downhill.

The fifth and last toki was called Te Uabuki te re (the sepulchre). Any craft coming so far was then doomed. The water rose in confused waves, with no direction, all around it, and it was sucked down into the depths.

See Further the story of Kabaki in the tradition of Nei Mangaririka.
The ancestors made their wonderful migrations in canoes. I have described elsewhere the canoes of the modern Gilbertese: it was presumably in craft of similar construction (i.e., having hulls built up of planks lashed together with string) that the ancestors of the race performed their wonderful migrations. The examination of evidence from the field of material culture lies outside the scope of this paper: when we seek evidence from traditional tales (rather than from archaeological sources) for the evidence of tradition; the account of the building of the "Lavacore" canoe exhibited in section 3 of this paper leaves small room for doubt that, during their sojourn in the Southern land called Tanoa, the Gilbertese ancestors used the built-up type of vessel having a single outrigger and float. That a craft composed of two hulls was once known to the race is implied by the name kaurua (Ellice Islands fauna - double canoe) given to deep-water vessels of the type pictured in the paper which I have quoted. It is significant to note in this connection that, until quite recently, the Gilbertese were in the habit of removing the float of a large canoe and replacing it by the hull of a smaller craft, for the purpose of giving the outrigger a greater carrying capacity whenever necessary.

A very characteristic feature of the Gilbertese hull-form is its intentional asymmetry, ingeniously designed with a view to counteracting the drag of the float. An apparently similar asymmetry has been noted in reports from other areas, but I

3 Guille 1924: 101-39
4 Guille 1934: 87-9
5 Kennedy 1931: 98; Guille 1924: Plate xxv-1.
6 Kennedy (1931: 78) notes a similar "edge" in the hull of Vaitapu canoe. The possibility of Gilbertese influence emanating from New should be considered in the connection - see Kennedy 1931: 71.

believe myself to have been the first to discover and explain its mechanical significance. This feature of construction deserves further research, inasmuch as it involves a fundamental mechanical principle which would tend to survive all material changes dictated by accident or environment.

As far as general form is concerned, a multitude of varying conditions (especially those connected with the quality and size of available timbers) may have caused profound local modifications of the original hull-construction since the race scattered to different groups from Tuamotu. A splendid example of the changes that environment can effect is afforded in the canoes of the Gilbertese-speaking population of Hui, in the Ellice Group. Fugitives from the Gilbert Islands of Tabiteuea, Beru and Honouti, some six generations ago, and forced to find a new home upon Hui, these people (though preserving their original speech, traditions and social organisation remarkably intact) have, for the last four generations at least, entirely abandoned the built-up type of canoe and adopted the dug-out form. I am indebted to E.E. Maude, of the Cambridge school of anthropology, for confirmation of my observation of this fact, and for the extremely important additional information that the Hui folk have not even preserved that most typical, effective and easily made adjunct of Gilbertese canoes - the Y-shaped stick attachment between outrigger and float.

So much for the durability of material forms when ordinary common-sense dictates their abandonment. The obvious reason for the radical change effected at Hui was that the dug-out type of craft seen in the Ellice Islands (with its strength of hull and compact outrigger and float) was better suited to local reef conditions than the Gilbertese vessel and its appurtenances — and much more easily
built, owing to the plentiful supply of fairly soft and moderately large timber. Such ready response by Oceanic races to local exigencies, and such eagerness to embrace new ideas — involving the wholesale replacement of one form by another — are too scantily recognized by students of material culture.

There can be no doubt whatever that the size, weight, material, and general composition of a canoe, cage or any other article of utility manufactured by natives are in many cases determined by physical conditions of a purely local kind. The receptiveness of Oceanic peoples to new ideas, from whatever source they may emanate, introduces a psychological element hitherto most surprisingly ignored by students — into the question of the build-up of local cultures on the material side. Local conditions must be known, and local history examined, before any safe generalisation based upon material evidence can be made.

Fundamental mechanical principles, once discovered, would indeed tend to stand fast through all changes of external fashion, for they would represent an elixir of utility which no craftsman would willingly discard. For this reason, I venture with some confidence the conjecture that the reasoned asymmetry of the built-up Gilbertese canoe has been carried over by the Fui people into the hulls of their dug-out craft. Mr. H. E. Mauds proposes to investigate this question at a fitting opportunity.

In making the following recantation, I shall not only correct a piece of bad ethnography which I heartily deplore, but shall also afford an excellent illustration of the manner in which important features of material culture can be obliterated. In 1924 I stated that both hulls and float attachments on the island of Banaba (where the population is Gilbertese) assimilated closely to those pictured by Hoodley from
Funaafuti. The notes and sketches upon which I based this report were made early in 1920, in two of the island’s four villages. Further research has shown that the craft which I observed were not of Banaban construction at all, having been the imported canoes of Ellice Island labourers employed in the local phosphate industry. The Banaban population learned in the course of twenty years to appreciate the value of Ellice Island canoes for reef-work, and acquired the habit of buying such craft from their owners when the latter completed their indentures and went home. In this manner, the true Banaban canoe was ousted from the two villages nearest to the settlement of the Ellice Islanders. In 1922, however, Ellice labourers ceased to be employed at Funaaba, and the supply of new canoes consequently failed at its source. The local timber being extremely hard, and so unsuitable for the easy manufacture of dug-outs, the Babahans never learned to make these craft for themselves: when the purchased canoes wore out, they were therefore replaced by vessels of the built-up type (boads being easy to buy), and the Island reverted to its own methods of construction. When the example of Haa is considered, no reasonable doubt can exist that, had there grown up on Funaaba a timber from which Ellice Island canoes could have been easily made, the Babahans would have adopted the new form in favour of their own, because of its superior utility under the conditions set by their lagoonless island.

In leaving the matter of the Gilbertese canoe now in the hands of experts upon material culture, I must anticipate my general indications from traditional evidence and state that the race appears to have migrated into the Pacific from Indonesia. It therefore seems very significant that the portion of Indonesia plotted out by Haddon as the present

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*Notes and references:*

1. Upper in note 1, page 123; Quible 1924: 123; Haddon 1897, Plate xv.
focus of outrigger canoes is almost exactly the area to which local tradition points as the pre-Oceanic fatherland. Haddon's commentary upon the evidence examined by him is worth quoting in full: "...it is legitimate to suppose that from Indonesia, if not actually from the Moluccas, migrations took place at various times, each with its special type of canoe or with some partial modification. As a general rule one might expect to find that the earlier types of canoes or of outriggers were those that went furthest, and those that started last would have a more limited distribution; but we must also remember that the later swarms would be more civilised and have a better technical equipment, and thus some of them may have passed over earlier layers and have reached a far destination."

2. Traditions connected with navigation.

Whatever may have been the craft in which the voyages of the Gilbertese ancestors were performed, it is clear that a high degree of seamanship was needed to bring them safe to their destinations. Despite the unfortunate meagreness of the facts recently collected concerning the astronomy and meteorology of the modern Gilbertese, they do, I think, warrant a presumption that the ancestors of the race came into Oceania with a system of navigation based mainly upon the observation of the heavenly bodies. Some few of the facts recorded in connection with the movements of the sun suggest, indeed, the further possibility that the elements of Gilbertese astronomy may have been learned from a people possessed of a mathematical system.

A short account was given in Part V of my paper on Gilbertese canoes of the method by which a Gilbertese boy was taught to observe the heavens; the list of 63 heavenly bodies thereto appended represents but a fraction of the
Ceremonies observed at launching a new canoe

At the point of dawn the new canoe was carried from its shed by the builder and his helpers and laid out on the shoal, pointing east and west, with its outrigger to the windward side.

If the tide was out, the keel of the canoe would be supported on several green, unhusked coconuts; if the tide was high, it would merely float.

The fan-shaped ends of coconut leaves were then laid (one each) on the stem, stern and outrigger of the craft, so that their tips were pointed outwards and overhung the water. These were to frighten away the evil spirits and fish that might do it harm.

Upon the leaves were laid green coconuts, babai and any other sort of food available, in small quantities. These constitute the food of the evil spirits, to divert their attention from the canoe itself.

While these various objects were being laid on the craft, incantations of the usual sort were muttered, the performers of the ceremony facing eastward.

This done, the canoe was left to lie until just before sunset on the same day. At this hour the same company proceeded to the canoe and threw all the food thereon into the sea; the coconut leaves being also cast away. These were supposed to drift away into the mouths of the various spirits and fishes that might do the craft injury, thus acting as a peace offering.

The canoe was then lifted out of the water and carried ashore. It was set down pointing east and west in a space prepared for it by the lagoon shore.

A large fire was then built near its stem, which pointed towards the lagoon; but if its orientation had happened to bring it parallel to the lagoon shore, it would have been lit at its western end, i.e. the end nearest the setting sun.
Coconuts and food were placed, while the fire was burning, inside its hull, at both stems and amidships, under the outrigger booms. The food was to placate, and the fire to frighten away, the unfriendly spirits that might inhabit the canoe. 'Tania ni kabi' (the frequenter of the keel) and other such names were attributed to these spirits. The idea in mind was that the canoe is, as it were, 'born in sin', and is the natural home of evil spirits which must be purged by fire before it is fit to do its work or safe for human use.

While the fire was burning itself out, a feast was started, of which not only the builders but also their relations partook. The canoe was then left overnight, with its food inside.

Next morning, at sunrise, the builders again carried the craft to water. The mast was set up to one charm; its sail was hoisted to another; its steering oar was lashed into place to a third; its fore and aft mast stays were adjusted to a fourth; and so on.

The canoe was then ready for its work.
In the sixty years during which I have been associated with the Gilbert Islands I have never succeeded in authenticating a sighting of Bikeni Karakara, nor have I seen it myself though I have searched the area around its supposed location on schooner passages from Butaritari to the southern islands. During World War II, furthermore, innumerable U.S. planes must have flown over the area without, so far as I have been able to ascertain, anyone reporting a reef in the vicinity. Hence I conclude that the atoll is now submerged. See also Heyen 1937:1.

For comments on Gilbertese betia see Lewis 1972:114, 215, 249, 319-20.


Kennedy 1931:98; Grimble 1924:Plate XXI.


Grimble 1924:123; Hedley 1897:Plate XV.

Haddon 1920:71.
into four zones, of which two are named and two merely described. In the first zone beyond the Fish-trap of Kabaki, the sea is said to take a downward slope away from home, and a mariner's return becomes increasingly difficult as he progresses towards the second zone. The second is a region of dead calms, where the downward slope of the sea becomes sharper still, and wherein dwells the monstrous mu-fish. This dreadful creature is said to be able with one suck (mu) to engulf and swallow a canoe "together with all its crew". The third zone, wherein the strayed voyager abandons all hope of life, is called

To-waen-i-anti - the shooting star (or wake) of spirits - and is described as the region where a man has two shadows. In the words of my informants: "If the voyager looks at the sail his shadow is there, and if he looks upon the water his shadow is upon the water". The fourth zone is called

To-walul-i-ko - The-cansise-the-somersault - and is haunted by a strange, lonely bird who cries continually, "I a known, I a known (I am unhappy, I am unhappy)". Here, the doomed canoe is seized in a resistless current which sweeps it West for a day and a night until it reaches the edge of a tremendous whirlpool, where it is sucked into the depths.

3. Other Geographical traditions

The above theory of the Western seas seems to have taken shape since the immigration of the ancestors from Temoe. This does not necessarily imply that the myth material involved is of modern origin, but the manner in which possibly ancient elements have been adapted to local use appears to reflect the attitude of a race which had begun to feel that Micronesia was its final home, and that further adventuring in the direction of Melanesia would be unprofitable. I read the traditions descriptive of the Western zones as a warning to young navigators against voyages of discovery beyond the "Fish veil of Kabaki"; as such they are definitely regarded by the old men of today.
The real geographical lore of the people, pertaining to lands outside the Gilbert Group, is no longer in the mouths of the navigators, but must be sought in myths and travel-stories of the kind exhibited in the preceding chapters. Some twenty or thirty distant places are named in the texts which have been produced, and one or two more can be added from other sources; these are to be gathered together in the present section for the further discussion, wherever possible, of their local or Polynesian associations.
Seamarks

In reckoning his daily position at sea, while travelling from island to island, the navigator had certain betia, or seamarks, which helped him to find his bearings. The knowledge of these betia was no doubt the cumulative result of many years of travelling. I have been able to find out 16 recognised betia.

1) If the navigator came to a place where 27 waves in succession seemed to rise as if from under the sea and travel past him from north to south, no matter what was the general direction of the swell, he knew that he was half a day's sail due north of Makin.

2) Farther north than this he would find that the prevailing wind was north-east instead of south-east (in the season of the Trades) and would know that to reach Makin he must return on his tracks.

3) If the north-east wind failed to warn him, he knew that farther still to northward there lay a belt of mabubu, mist or low visibility, to tell him that he had overshot his landfall.

4) If in trying to make Butaritari he hauled his wind too close (during the season of the south-east Trades) the betia known as the kainiman would warn him that he was to the eastward of his landfall. The kainiman was recognised by its numerous sharks, and especially by the shark known as Ngarei, which has but one row of teeth in each jaw. Another name for this betia was o-ni-bakoa (the enclosure of sharks).

5) To eastward of Makin also lay a kainiman or o-ni-bakoa, and an additional guide to the navigator was the presence of large numbers of Tropic Birds (Red Tailed).

6) A sign that a man was to north-east of Makin by a day's sail was the appearance of many sharks of the variety known Baiburebure (spotted-fin). The tips of shark's fins are touched with a yellowish white.
(7) South-west of Makin lay the betia where flying-fish were observed to leap frequently in pairs from the sea, and fly one just under the other.

(8) Due east of a middle point between Marakei and Makin was known the islet named Bike ni Karakara. This islet is uninhabited and uncharted, but it is known by European navigators to lie some sixty miles to the eastward of these two islands.

(9) To westward of Abaiang, half a day's sail, was a betia recognized by the presence of numerous jelly-fish called Wan Na Areau (canoe of Na Areau).

(10) A man knew that he was nearly in sight of the north end of Abaiang, but fallen away to leeward (westward), when he saw a species of sea-gull which flies in pairs, the birds continually revolving one about the other.

(11) Farther to westward of Abaiang and Tarawa a navigator would know that he was a day's sail from land by meeting with a very large variety of porpoise, said to be four fathoms long.

(12) West of Tamana was the betia called Te Arabungea. It is said that this was known by the presence of oily streaks on the sea's surface, having two arms thus \( \Rightarrow \). One of these arms invariably pointed to Tamana, the other to Tabiteuea.

(13) Just out of sight of land, to the south of Marakei, was Nei Roba: a large wave, or series of large waves, travelling northwards with curling crests, as if ready to break.

(14) Due south of Nei Roba was Te Kia, a series of large waves travelling northward, not breaking but with troubled flanks.

(15) North-east of Tarawa, half a day's sail, there was known to be a series of waves similar to Nei Roba but travelling always across the swell. This betia was called Te Akatara.
Terms for Landfall

Certain terms were used to describe the appearance of the land from a canoe. The general term for landfall was te Mui. There were four kinds of mui:

(a) Te Bono (the closed): descriptive of the trees, which when seen from close inshore form an unbroken line.

(b) Te Rawarawa (the interspaced): when more distant, the smaller trees disappear, leaving gaps between those still visible.

(c) Te Burabura (the similitude): when just visible, sitting on a canoe.

(d) Te Eko-mauna (the disappearing): when only visible from the crest of a wave.
As Europeans use landmarks, so the Gilbertese ancestors relied upon seamarks (batia) to check their daily position. These sign-posts in mid-ocean consisted of swarms of fish, flocks of birds, groups of driftwood, or conditions of wave and sky, discovered — and once discovered never forgotten — to be peculiar to certain zones of the sea. Hundreds of such traditional batia were stored up in the race memory as a result of the cumulative experience of generations. It is difficult for us to appreciate how very concrete and significant to the native mariner were the signs of sea and sky which to us seem so precarious. The people had, in fact, a sea-sense which we do not possess in anything like the same degree, and it was obviously this gift more than any other agency which guided their migrant ancestors safe to land across a vast and strange ocean where their star-lore could no longer serve them.

The following tabulated list of batia bears mostly upon conditions of travel between island and island of the Gilbert Group, and should be read from the viewpoint of a navigator whose home port was Butaritari, in the extreme North Gilberts; but though thus local in their application they do serve to suggest the bold technique, the shrewd observation that enabled the ancestors to undertake voyages of immensely greater duration.
<table>
<thead>
<tr>
<th>Designation of locality</th>
<th>Sailing directions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nce ailo vali------ (The twenty-seven waves)</td>
<td>If the navigator, northward bound during the season of S.E., trade-winds, overhaul Baron or Little Makin, he will come to a zone of ocean where a series of 27 waves rises from time to time as if from under the sea, and travels past him from N. to S. across any prevailing swell: from this he will know that Little Makin is half a day's sail to southward.</td>
</tr>
<tr>
<td>Te tangiij (The change of wind)</td>
<td>Further north than the 27 waves, the trade-wind will be found to change from S.E. to N.E.</td>
</tr>
<tr>
<td>Te maahina (The mist or low visibility)</td>
<td>Further still to northward, the voyager runs into a belt of low visibility which indicates that he is in the latitude of Fakarule - i.e., Jaluit Island, Edith Balls, about 250 miles N.W. of Little Makin - and</td>
</tr>
<tr>
<td>Te maahina (The enclosure of sharks)</td>
<td>Eastward of Kusaie (called Kurae in the Gilberts) is the fish called Make ni Karawa (sp. garfish), which leaps in great numbers from the sea. Further to eastward still, two day's sail from land are seen turtles in pairs, one of which jumps from the sea when approached while the other dives.</td>
</tr>
<tr>
<td>Te maahina (The mottled fin)</td>
<td>A second enclosure is recognized by the sailor to eastward of Little Makin, half a day's sail offshore. This locality is distinguished from the preceding one by its numerous Red Tailed Tropic Birds (Phaeton rubricauda).</td>
</tr>
<tr>
<td>Te hapiheure (The mottled fin)</td>
<td>To N.W. of Little Makin, a day's sail from land, is a zone of sea teeming with the species of shark called hapiheure, the tips of whose fins are touched with ivory-white markings.</td>
</tr>
<tr>
<td>Te hapiheure (The leaping of flying fish)</td>
<td>S.W. of Little Makin, due W. of Abaiang, and N.W. of Jaluit the navigator recognizes a region where the flying fish habitually leap in pairs from the sea, flying one just below the other and ultimately plunging together back into the waves.</td>
</tr>
<tr>
<td>Biruale---- (The growing islet)</td>
<td>Due east of a narrow point between Jaluit and Little Makin the navigator knows of a small, sandy islet, which he calls Biruale. (The existence of this tiny uninhabited island, about 60 miles eastward of the two islands named, is confirmed by European master-mariners).</td>
</tr>
</tbody>
</table>
| Wuna Na\-\- (The canoe of Na\-\-) | A point to westward of Abaiang, half a day's sail, is a zone frequented by impenetrable jelly-fish of the sort called \-\- Na\-\-.
The traveller knows that he is nearly in sight of the north end of Abaimag, but fallen away to westward, when he sees numerous terns flying in pairs, of which one bird continually revolves about the other.

Further to westward than the sea-birds, a day's beat away from land, is recognised a region frequented by schools of a very large variety of porpoise (possibly blackfish, "each one four fathoms long").

Due south of Marakei, just out of sight of land, is encountered Nei Raha - a large periodical wave, travelling due north, across any prevailing swell, with curling crest as if ready to break.

Half a day's sail farther south than Nei Raha, the traveller runs into To kia - a

(15) Between Tarawa and Maiana were porpoises in pairs, whose heads always pointed in the direction of the passage into Tarawa lagoon at the place called Bairiki. (It is quite possible that these porpoises would be feeding on some sort of food swept out of Bairiki passage by the tide race of the lagoon at falling water).

(12) A betia to the west of Maiana, just out of sight of land, was a submerged reef, some six fathoms below the surface. This reef is said by old navigators to stretch south-west to the southern point of Aranuka, some sixty miles away. It is a haunt of porpoises.

Beck (a kind of wave)"of the Gilbertese of the last fifteen to twenty generations seem to have avoided venturing in a westerly direction, their geography of the seas farther over towards Melanesia has therefore taken on a mythical character. The Western ocean is theoretically plotted out
'Toki' to westward

There were certain traditional signs by which navigators judged their distance westward of the land. The safety limit to leeward (i.e. westward in the season of the Trades) was called the 'fish-wall of Kabaki' (see the story of Kabaki in the tradition of Nei Manganibuka). It consisted of a line of leaves and rubbish scattered over the sea from Makin to Samoa, far to the westward of the land. This is possibly quite true, the rubbish being carried by some current.

The sea was said to slope sharply down to westward (batetefio) beyond this limit, and return was difficult. If a craft fell away farther to leeward it came eventually to a second limit (toki), which was a region of ariki, or dead calm. The frequenter of these waters was a gigantic fish called te Uu, which sucked canoes and their occupants into its mouth and swallowed them whole.

The third toki, farther west again, was called Wenei Anti (shooting star of spirits). In this place a man had two shadows. If he looked at his sail his shadow was there, and if he looked at the water his shadow was there too.

The fourth toki was recognised by the appearance of a bird whose cry was continually 'I a kawa, I a kawa' (I am unhappy, I am unhappy). And in this place it was hopeless to think of a return, for the sea sloped sharper still to westward and the waves rushed like a river (karanga) downhill.

The fifth and last toki was called Te Uabuki te re (the craft coming so far was then doomed). Any craft coming so far was then doomed. The water rose in confused waves, with no direction, all around it, and it was sucked down into the depths.

1 See f... and the story of Kabaki in the tradition of Nei Manganibuka
2 See Kittelae (3)
I have described elsewhere the canoes of the modern Gilbertese: it was presumably in craft of similar construction (i.e., having hulls built up of planks lashed together with string) that the ancestors of the race performed their wonderful migrations. The examination of evidence from the field of material culture lies outside the scope of this paper; as for the evidence of tradition, the account of the building of the "Kaberoro" canoe exhibited in Section 3 of the Little Malin period leaves small room for doubt that, during their sojourn in the Southern land called Tanwa, the Gilbertese ancestors used the built-up type of vessel having a single outrigger and float.\(^3\) That a craft composed of two hulls was once known to the race is implied by the name mamua (Ellice Islands moom - double canoe) given to deep-water vessels of the type pictured in the paper which I have quoted. It is significant to note in this connection that, until quite recently, the Gilbertese were in the habit of removing the float of a large canoe and replacing it by the hull of a smaller craft, for the purpose of giving the outrigger a greater carrying capacity whenever necessary.

A very characteristic feature of the Gilbertese hull-form is its intentional asymmetry, ingeniously designed with a view to countering the drag of the float.\(^4\) An apparently similar asymmetry has been noted in reports from other areas, but I...
believe myself to have been the first to discover and explain its mechanical significance. This feature of construction deserves further research, inasmuch as it involves a fundamental mechanical principle which would tend to survive all material changes dictated by accident or environment.

As far as general form is concerned - a multitude of varying conditions (especially those connected with the quality and size of available timbers) may have caused profound local modifications of the original hull-construction since the race scattered to different groups from Tahiti. A splendid example of the changes that environment can effect is afforded in the canoes of the Gilbertese-speaking population of Nui, in the Ellice Group. Fugitives from the Gilbert Islands of Tabiteuea, Bora and Nonouti, some 10 generations ago, were forced to find a new home upon Nui, and these people (though preserving their original speech, traditions and social organisation remarkably intact) have, for the last four generations at least, entirely abandoned the built-up type of canoe and adopted the dug-out form. I am indebted to Mr. H.E. Maude, of the Cambridge school of anthropology, for confirmation of my observation of this fact, and for the extremely important additional information that the Nui folk have not even preserved that most typical, effective and easily made adjunct of Gilbertese canoes - the Y-shaped stick attachment between outrigger and float.

As such for the disability of material forms when ordinary common-sense dictates their abandonment. The obvious reason for the radical change effected at Nui was that the dug-out type of craft seen in the Ellice Islands (with its strength of hull and compact outrigger and float) was better suited to local reef conditions than the Gilbertese vessel and its appurtenances - and much more easily
built, owing to the plentiful supply of fairly soft and moderately large timber. Such ready response by Oceanic races to local exigencies, and such eagerness to embrace new ideas - involving the wholesale replacement of one form by another - are too generally recognised by students of material culture.

There can be no doubt whatever that the size, weight, material, and general composition of a canoe, edze or any other article of utility manufactured by natives are in many cases determined by physical conditions of a purely local kind. The receptiveness of Oceanic peoples to new ideas, from whatever source they may emanate, introduces a psychological element - hitherto most surprisingly ignored by students - into the question of the build-up of local cultures on the material side. Local conditions must be known, and local history examined, before any safe generalisation based upon material evidence can be made.

Fundamental mechanical principles, once discovered, would indeed tend to stand fast through all changes of external fashion, for they would represent an elixir of utility which no craftsman would willingly discard. For this reason, I venture with some confidence the conjecture that the asymmetry of the built-up Gilbertese canoe has been carried over by the Fui people into the hulls of their dug-out craft.

Mr. H. E. Mawle promises to investigate this question at a

In making the following recantation, I shall not only correct a piece of bad ethnography which I heartily deplore, but shall also afford an excellent illustration of the manner in which important features of material culture can be obliterated. In 1924 I stated that both hulls and float attachments on the island of Banaba (where the population is Gilbertese) assimilated closely to those pictured by Hedley from
Funafuti. The notes and sketches upon which I based this report were made early in 1920, in two of the island's four villages. Further research has shown that the craft which I observed were not of Banaban construction at all, having been the imported canoes of Ellice Island labourers employed in the local phosphate industry. The Banaban population learned in the course of twenty years to appreciate the value of Ellice Island canoes for reef-work, and acquired the habit of buying such craft from their owners when the latter completed their indentures and went home. In this manner, the true Banaban canoe was ousted from the two villages nearest to the settlement of the Ellice Islanders. In 1922, however, Ellice labourers ceased to be employed at Banaba, and the supply of new canoes consequently failed at its source. The local timber being extremely hard, and so unsuitable for the easy manufacture of dug-outs, the Bababans never learned to make these craft for themselves; when the purchased canoes were out, they were therefore replaced by vessels of the built-up type (boards being easy to buy), and the island reverted to its own methods of construction. When the example of Fui is considered, no reasonable doubt can exist that, had there grown upon Banaba a timber from which Ellice Island canoes could have been easily made, the Bababans would have adopted the new form in favour of their own, because of its superior utility under the conditions set by their lagomelous island.

In leaving the matter of the Gilbertese canoe now in the hands of experts upon material culture, I must anticipate my general deductions from traditional evidence and state that the race appears to have migrated into the Pacific from Indonesia. It therefore seems very significant that the portion of Indonesia plotted out by Haddon as the present

5. report 423. Quibble 1924: 123.
6. Haddon, op. cit. in note 2, page 71.
focus of outrigger canoes is almost exactly the area to
which local tradition points as the pre-Oceanic fatherland. Haddon's commentary upon the evidence examined by him is
worth quoting in full: it is legitimate to suppose
that from Indonesia, if not actually from the Moluccas,
migrations took place at various times, each with its
special type of canoe or with some partial modification.
As a general rule one might expect to find that the earlier
types of canoes or of outriggers were those that went
furthest, and those that started last would have a more
limited distribution; but we must also remember that the
later swarms would be more civilised and have a better
technical equipment, and thus some of them may have passed
over earlier layers and have reached a far destination.

2. Traditions connected with navigation.
Whatever may have been the craft in which the voyages
of the Gilbertese ancestors were performed, it is clear
that a high degree of seamen'ship was needed to bring them
safe to their destinations. Despite the unfortunate
neglectness of the facts recently collected concerning the
astronomy and meteorology of the modern Gilbertese, they
do, I think, warrant a presumption that the ancestors of the
race came into Oceania with a system of navigation based
mainly upon the observation of the heavenly bodies. Some
few of the facts recorded in connection with the movements
of the sun suggest, indeed, the further possibility that
the elements of Gilbertese astronomy may have been learned
from a people possessed of a mathematical system.
A short account was given in Part V of my paper on
Gilbertese canoes of the method by which a Gilbertese boy
was taught to observe the heavens: the list of 63 heavenly
bodies thence appended represents but a fraction of the
Ceremonies observed at launching a new canoe at Abaiang

At the point of dawn the new canoe was carried from its shed by the builder and his helpers and laid out on the shoal, pointing east and west, with its outrigger to the windward side.

If the tide was out the keel of the canoe would be supported on several green, unhusked coconuts; if the tide was high it would merely float.

The fan-shaped ends of coconut leaves were then laid (one each) on the stem, stern and outrigger of the craft, so that their tips were pointed outwards and overhung the water. These are to frighten away the evil spirits and fish that might do it harm.

Upon the leaves were laid green coconuts, babai and any other sort of food available, in small quantities. These constitute the food of the evil spirits, to divert their attention from the canoe itself.

While these various objects were being laid on the craft, incantations of the usual sort were muttered, the performers of the ceremony facing eastward.

This done the canoe was left to lie until just before sunset on the same day. At this hour the same company proceeded to the canoe and threw all the food thereon into the sea; the coconut leaves being also cast away. These were supposed to drift away into the mouths of the various spirits and fishes that might do the craft injury; thus acting as a peace offering.

The canoe was then lifted out of the water and carried ashore. It was set down pointing east and west in a space prepared for it by the lagoon shore.

A large fire was then built near its stem, which pointed towards the lagoon; but if its orientation had happened to bring it parallel to the lagoon shore it would have been lit at its western end, i.e. the end nearest the setting sun.
Coconuts and food were placed, while the fire was burning, inside its hull: at both stems and amidships, under the outrigger booms. The food was to placate, and the fire to frighten away, the unfriendly spirits that might inhabit the canoe. 'Tania ni kabi' (the frequenter of the keel) and other such names were attributed to these spirits. The idea in mind was that the canoe is, as it were, 'born in sin', and is the natural home of evil spirits which must be purged by fire before it is fit to do its work or safe for human use.

While the fire was burning itself out a feast was started, of which not only the builders but also their relations partook. The canoe was then left overnight, with its food inside.

Next morning, at sunrise, the builders again carried the craft to water. The mast was set up to one charm, its sail was hoisted to another; its steering oar was lashed into place to a third; its fore and aft mast stays were adjusted to a fourth; and so on.

The canoe was then ready for its work.