



THE ORGANISATION OF NAVIGATIONAL KNOWLEDGE ON PULUWAT

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# THE ORGANISATION OF NAVIGATIONAL KNOWLEDGE ON PULUWAT

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This article describes some of the mnemonic devices and systems of classification employed by the navigators of the atoll of Puluwat (Central Caroline Islands) to arrange their knowledge of geography and of star courses into organised bodies of data. The word geography is used here in a very broad sense, to include both natural and mythical phenomena, and animate beings as well, when they are part of those bodies of data and are used as reference points by navigators in finding their way on the high seas.

The material presented here is far from exhaustive. Its collection was done incidentally to other work in May, 1967,<sup>(1)</sup> and was cut short by events of the field trip. But what is presented provides some idea of the extraordinary quantity of information learned by qualified navigators and of the imagery employed in order to retain it in memory and to order the items into manageable inventories of knowledge.<sup>(2)</sup>

Ten of the eleven categories of information described in the body of this paper consist of geographical arrangements based on as many metaphors. The narrator of the system imagines himself in a canoe, following a path from place to place, real or mythical, in accordance with the scheme of the metaphor; or he extends a breadfruit picker from one island to another to draw back some desirable object; or he pursues an ever-escaping fish while trying to spear it at esoterically-named reef-holes on

1. My two colleagues in this expedition were Dr Thomas Gladwin and Dr Samuel Elbert, to both of whom I am grateful for their helpful collaboration in the field. With his kind permission, I have drawn freely on Gladwin's unpublished field notes for this study.
2. A Yale University student, Peter Ochs, who assisted me in the summer of 1969 with the support of the National Science Foundation's undergraduate research participation programme was motivated to spend the following summer on Puluwat, aided by a Yale University grant. While I described in this study some 11 systems of classification of knowledge, Ochs writes to me that T., one of my two principal informants, gave him some 70 or 80 groupings and sub-groupings of navigational information, including all of the systems I recorded (with some changes of detail) in addition to ceremonies, magic, songs, taboos, etc. I take the opportunity to acknowledge my debt to Peter Ochs for his work in plotting charts from my field notes during the summer he assisted me; some of that work is described here whenever allusion is made to attempts to pinpoint place-names on the map.

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successive islands; or he seeks a fish with the aid of a torch as he hunts him from place to place. The figure of speech is an instrument, Puluwatans agree, which enables them to learn and to remember the relationships between geographical phenomena, and between such phenomena and the courses of the stars. But the categories are more than just lists of items of information (though they are presented in this paper in the form of such lists); they are also a kind of literature, and some of them are chants; parts of them are secret, known only to ordained navigators, and some of the language is in the arcane *yitang* speech.

The captain of a sea-going canoe in the Central Carolines commands as aids to his navigation far more than knowledge of the mountain tops that rise just above the level of the sea to form the dozen or two dozen islands that he visits. To him, the ocean's surface is studded with hundreds, perhaps thousands, of other things, whose names, locations, and relationships he knows, and which function as sea-marks for him. Some of them are real enough phenomena; some must seem to us to be in the realm of the fabulous. There are the islets, the reefs, the sandbanks; perhaps also the discoloured patch of water or the shark that is always to be found at a particular reef is also real; but then there are the two-headed whale, the hovering frigate bird with the plover constantly flying circles around it, the spirit who lives in a flame, the man in a canoe made of ferns. And all of these, the real islands and the fantastic monsters alike, are permanent geographical features; all of them are more or less useful sea-marks, all of them bear names, and all of them are seriously regarded—though not all are equally important—as navigational aids. What and where they are, and how they are grouped, form the descriptive part of this article.

The metaphor employed in any one system determines in part, according to its nature, what kinds of information will be included in that system. Some of the systems, in addition, impose rules upon themselves. Reef Hole Probing is limited to the naming of islands and their passes, while Sea Life (not one of the systems described here) includes no islands at all, and The Lashing of the Breadfruit Picker is a combination of both. But all the systems together cut across each other so much that some place names appear again and again. In a few instances, when unknown geographical features are often mentioned and when enough courses from identifiable islands to them have been given, an attempt has been made to locate them by projecting the courses on a chart. These attempts, largely unsuccessful, are described in what follows. The intersections of the projected courses generally coincide poorly with known bathymetric features. To be sure, the bathymetric charts are surprisingly imperfect for some parts of Micronesia, and perhaps that is a partial explanation. The navigators cling to their faith in the reality of the phenomena they describe with such tenacity that one seeks for reasons not to be completely iconoclastic.

The Puluwat men who supplied information are:

Yangowúúr (Y), Tawuweru (T), Hipour (H), Ikuliman (I), and Yangora (X). Hereafter, reference to them will be by the symbols after their names. Most of the information comes from Y. and T. Both of these men belong

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to the Fáánúr school of navigation, though the details they furnish are often at considerable variance with each other, and from those supplied by H., who belongs to the other school, Warieng.

The stars used in the Central Carolines for navigation are the following:

Name	Compass Position
1. Polaris	0°
2. Beta Ursae Minoris	14°
3. Alpha Ursae Majoris	27°
4. Alpha Cassiopeiae	33°
5. Vega	51°
6. Pleiades	66°
7. Aldebaran	73°
8. Gamma Aquilae	79°
9. Altair	81°
10. Beta Aquilae	84°
11. Orion's Belt	91°
12. Gamma Corvi	108°
13. Antares	117°
14. Lambda Scorpii	127°
15. Crux	154°
16. Crux at rising of Alpha Centauri	166°
17. Crux Upright	180°
18. Crux with Alpha Centauri at meridian	193°
19. Crux	206°
20. Lambda Scorpii	233°
21. Antares	243°
22. Gamma Corvi	252°
23. Orion's Belt	269°
24. Beta Aquilae	276°
25. Altair	279°
26. Gamma Aquilae	281°
27. Aldebaran	287°
28. Pleiades	294°
28. Vega	309°
30. Alpha Cassiopeiae	327°
31. Alpha Ursae Majoris	333°
32. Beta Ursae Minoris	346°

Reference to these stars in this paper will be by the numbers prefixed to their names.

The 11 categories of navigational information which are to be described are as follows:

- I. Reef Hole Probing
- II. Catching the Sea Bass
- III. The Sail of Limahácha
- IV. Aligning the Weir
- V. Looking at an Island
- VI. The Great Trigger Fish

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- VII. Ayúfál's Tail
- VIII. Aligning the Skids
- IX. The Fortune Telling of the Sea Bass's Food
- X. The Torch of the Lagoon of Anúúfa
- XI. The Lashing of the Breadfruit Picker

### I. REEF HOLE PROBING

(*aaʔuwóów*)

In its practical application, as described by Gladwin,<sup>(3)</sup> Reef Hole Probing is a system, upon approaching an island, for finding the entrance through the reef into the lagoon. A star bearing may be the key element in the directions learned by the navigators, but the approach might also involve, or exclusively consist of, a mountain peak, boulders on the reef, a sighting on an exposed reef, or even the blowing of a conch until someone ashore comes out to act as pilot.

However, T. and Y. place Reef Hole Probing in an entirely different context, minimising considerably the practical aspects of the system. More prominent is the image of a species of parrot fish (*meruput*) which lives in a deep hole in the reef of Puluwat. The idea is that the fish is frightened by probing into the hole (*wóów*) with a stick (*aaʔu*; hence *aaʔuwóów*) and flees to the reef hole of another island. There again the stick threatens it and it swims to the reef hole of a third island, and so on until it returns again to Puluwat at the end of the circular chain of islands specified in the recital of the *aaʔuwóów* system. Here it is finally caught. Each time the fish flees it does so under the appropriate star bearing for the next island, which is specified in the *aaʔuwóów* sequence. The islands are called not by their common names but by their hole names. East Fayu, for example, is called *Wóówilópwút*, hole of the sea eel. Other names translate as hole of the canoe platform, hole of the house post, hole of the sea urchin, etc. These names are part of the esoteric knowledge of the navigators, who delight in using them to confound the uninitiated who may be present. They are also part of the literature of Puluwat, for there are chants reciting the succession of names.

The holes are apparently real enough but not easy to find. Indeed, T. says that there are many holes in the reefs and one cannot tell which is which except at four islands: Pulusuk, Puluwat, Magur and East Fayu. The purpose of the system, he says, is simply to remember the location of the islands in relation to each other. T. actually denies that the system takes a navigator to a pass at all; he uses the stars specified in the system only until the island is sighted. As proof of this, T. points out that the Puluwat hole is, in fact, on the north side of the atoll, while the main pass is on the south side. (Despite this, the hole names in at least two cases—East Fayu and Truk—are the same as the names of the pass at East Fayu and the main western pass at Truk).

The two informants who related the system to me gave me sequences which differ somewhat from each other. They are, with hole names and star courses omitted, as follows:

3. Gladwin, unpublished field notes.

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Y.	T.
Puluwat	Puluwat
Pulusuk	Pulusuk
Tamatam	Tamatam
Pulap	Pulap
Ulul	Ulul
Magur	Magur
Ono	Ono
Onari	Onari
Piseras	Piseras
East Fayu	East Fayu
Nomwin	Nomwin
Fananu	
Truk	Truk
Oroluk	Oroluk
Ponape	Ponape
Kusaie	Kusaie
Ngatik	Ngatik
Lukunor	
South pass of Satawan atoll	
Ta	
Satawan	
Mor	
Kutu	
Etal	
Pass of Namoluk	Namoluk
Pulusuk	
Puluwat	Puluwat

Y. thus includes in the system nearly all of the islands of the Carolines east of the Pulusuk-Puluwat-Tamatam-Pulap chain (the four places commonly called the Western Islands), omitting only Pingelap, Mokil, the two islands of Murilo atoll (Murilo and Ruo; he specifically excludes these because, he says, they are included in the Breadfruit Picker system, q.v.), Nama, and Losap. T. takes a short cut on the return trip westward from Kusaie, leaving out all of the Mortlocks except Namoluk. The hole names of the two lists are the same except for the five islands of Namonuito atoll and Nomwin, where they differ.

II CATCHING THE SEA BASS  
(*féáliy*)

This system resembles Reef Hole Probing in that once more there is an image of chasing a fish (this time the áliy, or sea bass) from island to island until it is finally caught by hand (*fé*: hence *féáliy*). T. again chases the fish from reef hole to reef hole, but Y. does it from pass to pass, and on a different course entirely. Both follow the stars under which the various islands lie to which the fish flees. T.'s sequence begins at Pulusuk instead of at Puluwat as with Reef Hole Probing. It follows exactly the same course (using hole names), as before, as far eastwards as Nomwin, but after that

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T. goes to Fananu, Ruo, Murilo, Truk, and finally Puluwat, without returning to Pulusuk.

Y.'s course is quite different, being a westward one. Instead of hole names he recites the names of passes through the reef. He begins with the pass at Nama and ends with three unidentifiable places, the course, with star names and pass names omitted, being:

Nama  
Truk (south pass)  
Puluwat  
Satawal  
Lamotrek  
Channel between Elato and Lamoliur (see XI H 8d)  
Ifaluk  
Woleai  
Fais  
Ulithi  
Yap

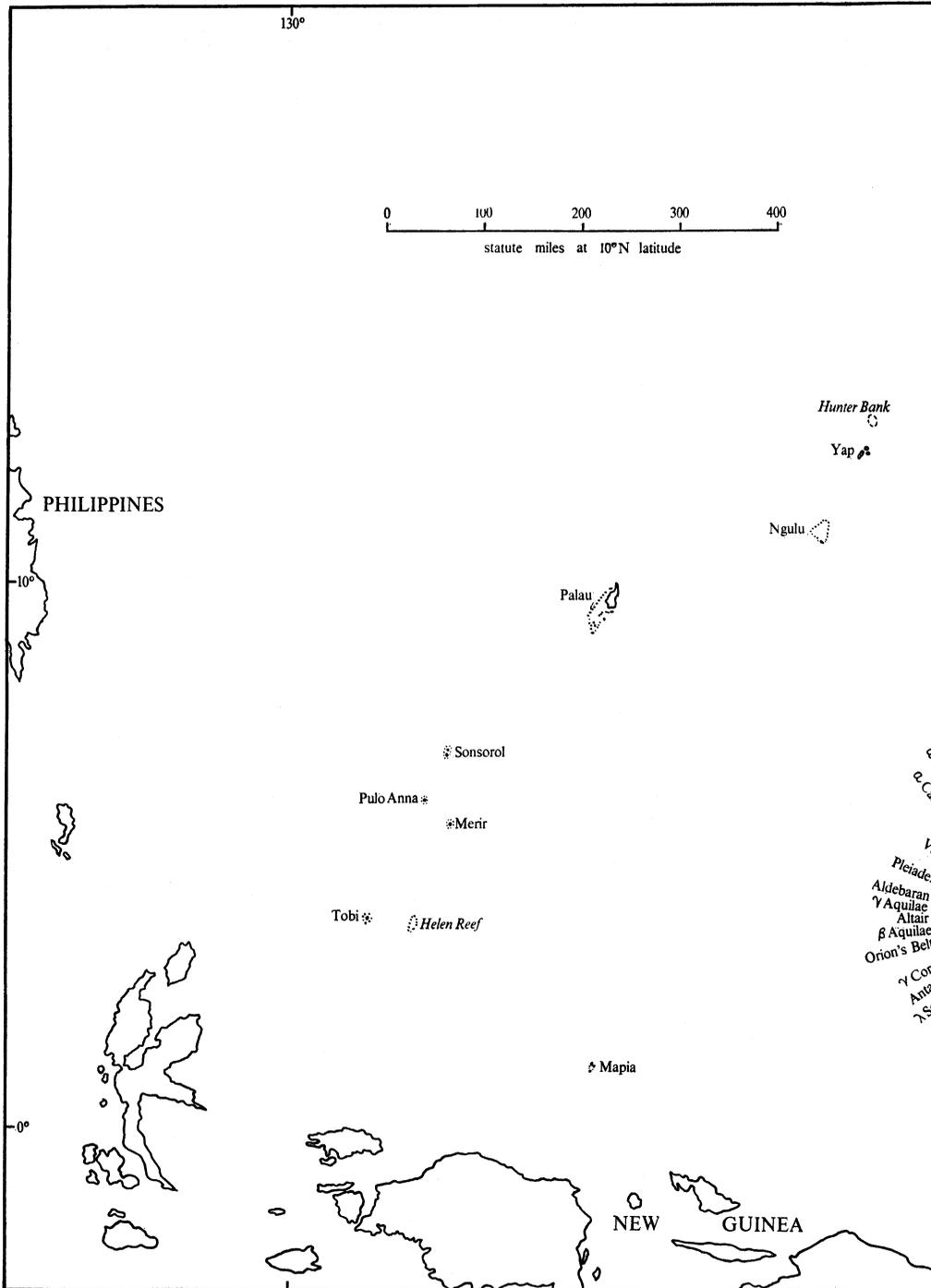
The channel of a place called Heleita (see V, XI A 3p, and XI J)

The channel of a place called Ailiáf (see XI A 3q)

A large coral head in the sea, in the shape of a canoe, named Naihániwa (see XI A 3r and XI H 5i) which is where the fish is finally caught.

These last three unidentifiable and perhaps mythological places are all given by Y., one after the other, as lying under the setting of Altair, on a course west from Yap. In *The Breadfruit Picker* outside Pulusuk (XI A 3p) as given by Y., the same three places are on a course west of Fais. In one of H.'s *Breadfruit Pickers* (XI J), one reaches Yap from the west by sailing east from Heleita, under the rising of Altair. In the *Looking at an Island* system, as given by T., the star course to Heleita from Angaur, in the Palaus, is again under the setting of Altair. And in T.'s *Breadfruit Picker* under Altair (XI H 5i) the coral head named Naihániwa is once more west, by way of Altair, from Yap.

It should be mentioned here that the *Breadfruit Picker* courses, unlike those of the other systems, are not necessarily on a straight line under the star named in the directions, but include one star to each side of it, thus covering a sector of the horizon three stars wide. In the case of the setting of Altair (279 degrees), the *Breadfruit Picker* would therefore include the area between Beta Aquilae and Gamma Aquilae, 276 to 281 degrees. The only other clue to where the three semi-mythical places may lie is provided by Y.'s remark that Heleita lies between Palau and Menado; but Menado can hardly mean the place in the Celebes known to us by that name; possibly it means Mindanao, which does lie west of Palau, Yap and Fais, or perhaps it is somewhere else in the Philippines. But elsewhere Y. says that Menado used to be thought of as the northern edge of New Guinea, which was considered to include any remote land to the east, west and south of the "civilised" world, the non-cannibalistic world, that is, the Caroline Islands.



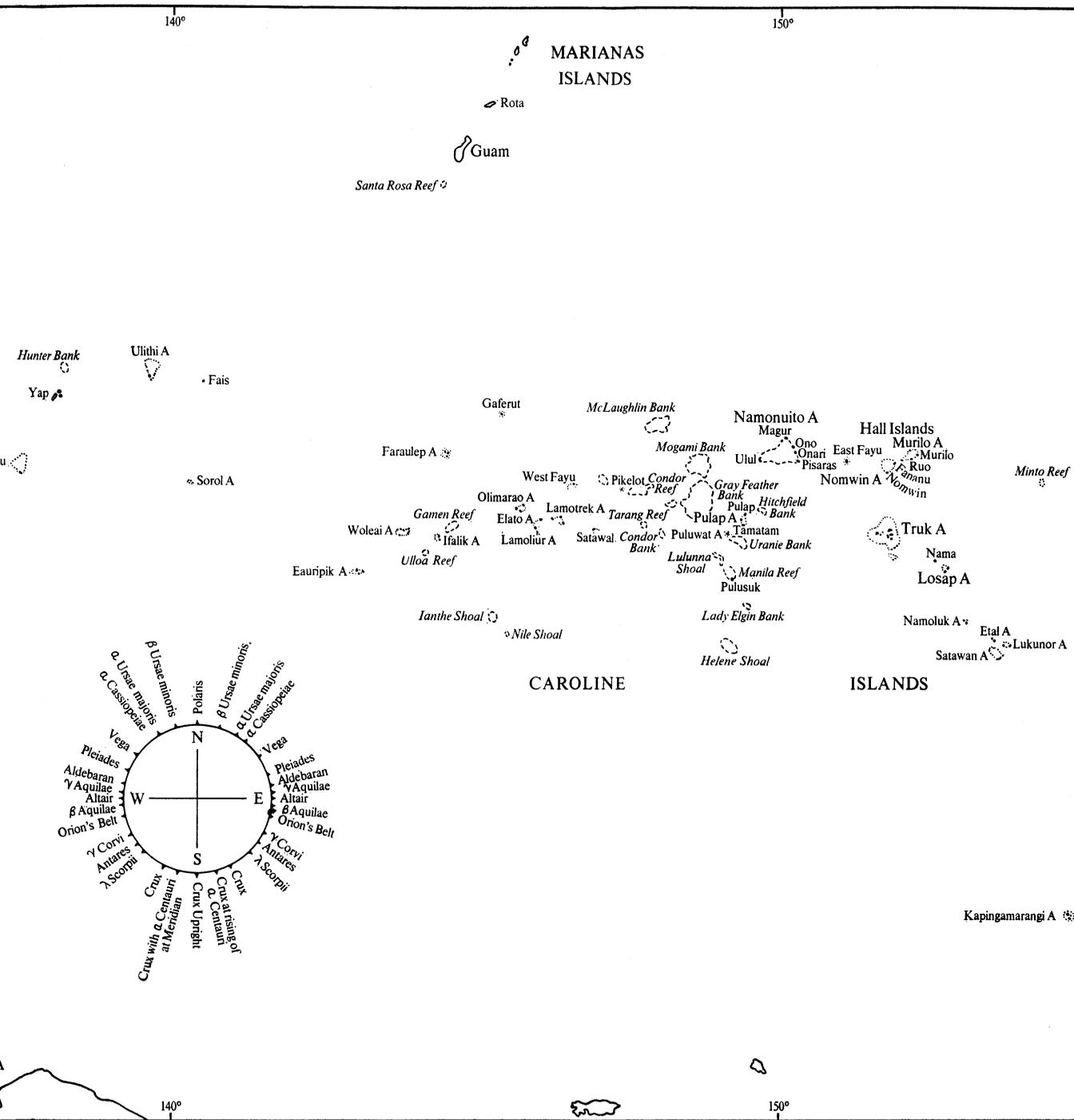
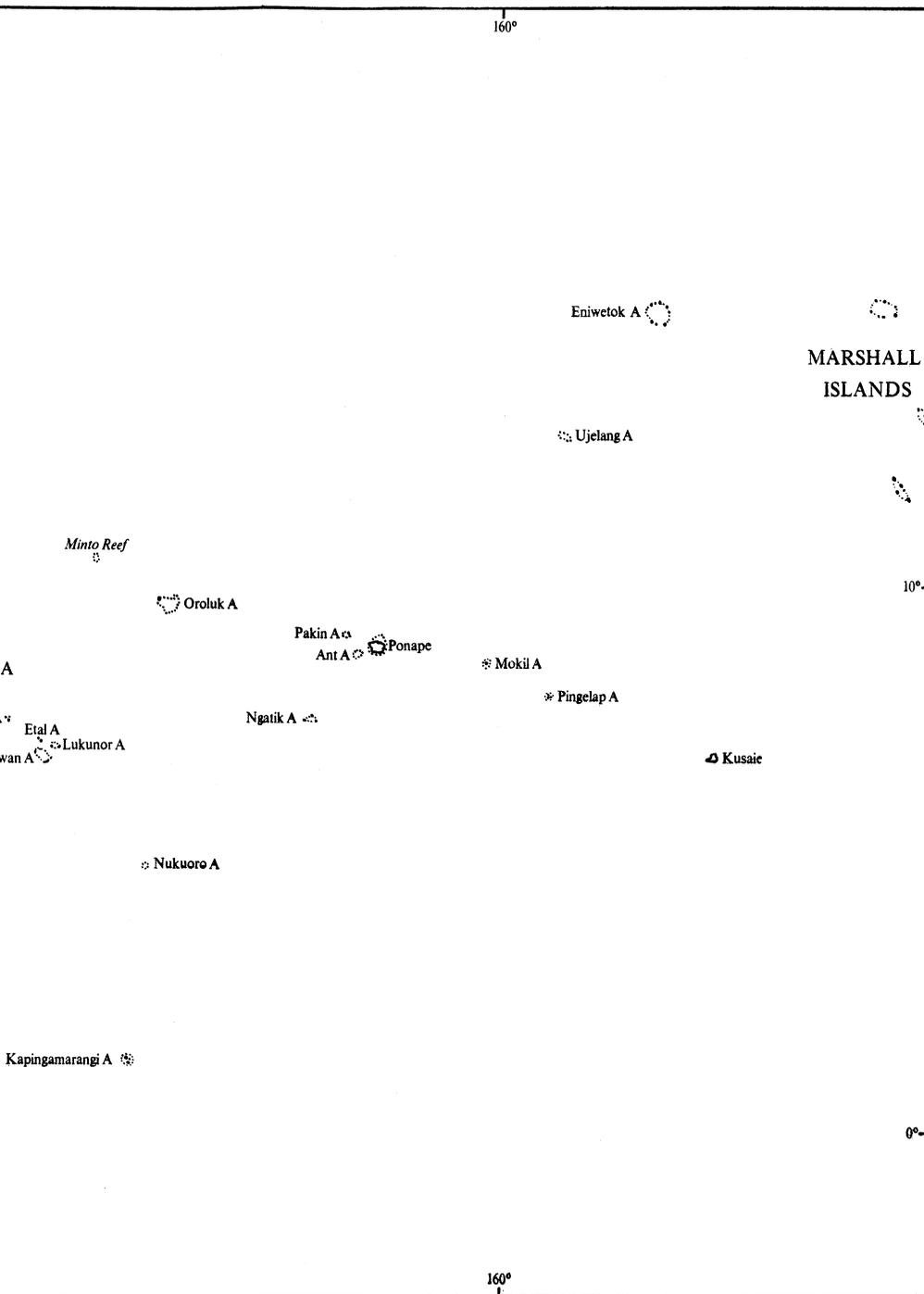


FIGURE 1



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III THE SAIL OF LIMAHÁCHA  
(*herekilimahácha*)

This system, according to Y., is visualised as following the course navigated by a certain fish, Limahácha. (Gladwin's notes, however, refer to Limahácha as the name of a famous navigator of old). The course followed is represented by the following idealised diagram:

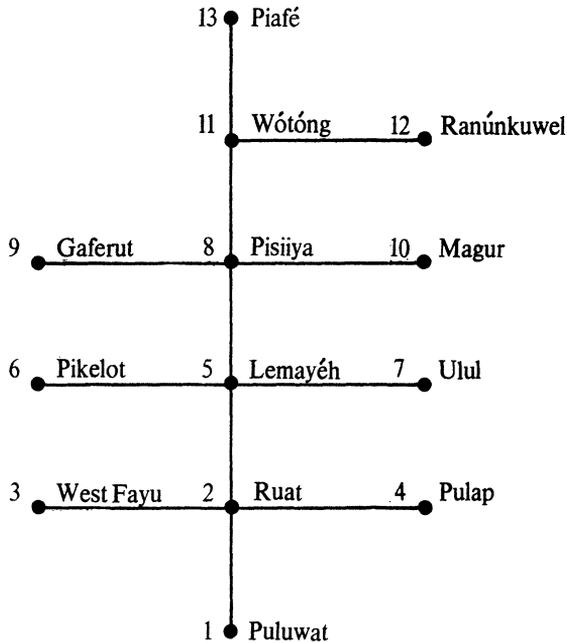


FIGURE 2

In the diagram the points of intersection (Nos. 2, 5, 8, 11) and the northernmost point (No. 13) represent reefs, named as indicated. All the other places are islands, except No. 12 which is a place where a whale with two tails lives. (The same place and creature occur in VI, X and XI D 15). The course taken by Limahácha is as follows:

Point	1	to Point	2	under Star No.	1
	2		3		25
	3		2		9
	2		4		11
	4		2		27
	2		5		1
	5		6		25
	6		5		9
	5		7		6
	7		5		22
	5		8		1
	8		9		25

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9	8	9
8	10	9
10	8	25
8	11	1
There is no course from 11 west; "there is nothing to go to".		
11	12	9
12	11	25
11	13	1
13	1	17

These courses, when plotted, form a diagram which deviates considerably from the idealised one. The reefs which form part of the system are impossible to pinpoint. Gladwin's notes place Chuwat (Ruat, No. 2) in the southern tip of Gray Feather Bank, and T. puts it east of Pulap, which would confirm Gladwin's information. Krämer<sup>(4)</sup> mentions a Suat between Satawal and Puluwat, which would suggest Condor Bank, and Damm<sup>(5)</sup> puts it east of Pikelot, which would probably mean Condor Reef. Burrows<sup>(6)</sup> gives a course from Satawal under star 7 to a reef known as Truata-levalerik on the way to Puluwat, which would seem to be the same place, since I have Ruatenfenerik as an alternative name, but if so it is on the wrong course. The other reefs indicated by intersections in the diagram may be located in other parts of Gray Feather or in Mogami or McLaughlin banks, although in XI E 2 b, T.'s Breadfruit Picker of Pagurer, Pisiya (No. 8 of the diagram) is identified as a sandbank south-west of Namonuito. Y. says that one could go from Piafé (No. 13) to Saipan by following Star 32, but the system does not include Saipan.

The purpose of the Sail of Limahácha, says T., is to be able to orient oneself relative to other places in the diagram if one is at these reefs. The system includes a physical description of each reef for purposes of identification.

IV ALIGNING THE WEIR  
(*hémaay*)

Y. provided two fragmentary versions of this system. He says he learned it from his father but has forgotten the details. The image here is of a stone fish weir (*maay*) in the shape of a V. The stones forming the two legs of the V are a series of reefs and islands. In one of Y.'s versions the apex of the V points south and is located midway between Puluwat and Truk, at a place in the sea where a swordfish called *Eherewór* lives, and the legs extend roughly north-west and north-east from the fish. (*Eherewór*, meaning Fish-Scaring Bank, is the name of this individual swordfish; it is also mentioned by T. in XI F 3e, Breadfruit Picker of Gamma Corvi, between Truk and Puluwat, though there it appears to be closer to Puluwat). Once Y. was sailing from Truk with a navigator, his uncle, and about half-way to Puluwat they saw this swordfish, whereupon the navigator said: "Now the stones (of the weir) are all in line", (*hé*, to align; hence *hémaay*), meaning the V was formed in his mind.

4. Krämer 1937:124.  
5. Damm 1935:55.  
6. Burrows 1957:342.

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In the second version, Y. has the apex of the weir pointing north and places it between East Fayu and Piseras, while the two legs terminate at Pulusuk and Kutu.

In Gladwin's notes, taken from I., there is a reference to a kind of inventory of places known as maayeweán limasechcha (= the limahácha of the previously given Sail of Limahácha), or the fish weir of the famous navigator of this name. Y. says that this is the same as the system under discussion. Gladwin describes it as "listing a series of places on the Gray Feather and Mogami Banks, and giving the star bearings from each place to Ulul and Pikelot respectively." Evidently, then, there are other imaginary weirs that are used for navigation in this part of the Caroline Islands. Unfortunately, we have no further information.

V. LOOKING TOWARD AN ISLAND (FROM ANOTHER ISLAND)

(*wowfanú*)

This system differs from the other ten described in this paper in that no image is evoked, no metaphor employed, to aid the memory. As T. gives it, it consists simply of a kind of boxing of the compass. T. takes an island as a centre (he says he knows the *wowfanú* for every island in the Carolines between Palau and Kusaie) and names the nearest island to it (if there is one) that lies under each star of the compass in turn, usually but not always beginning with Star 9, and proceeding around the compass in a counter-clockwise direction. The opposite star, for returning to the central island, is also given. The recitation for any particular island should always begin with the same star, whether it is No. 9 or some other star. If there is no island to mention under a star, that star should be omitted—but T. sometimes violates his own rule, he admits, by mentioning things other than islands, as will be seen.

In Gladwin's notes from H., Looking Toward an Island is described in entirely practical terms, as star-courses between pairs of islands, and there is no mention of reefs, sea life, or mythical beings, in contrast to the three examples from T. given below. In these examples, as well as in other classifications to come, place names identifiable on the map are followed by an asterisk.

Looking Toward an Island from Kusaie

Star Course No.:	To:	Return Star No.:
9	Ebon* (Marshalls)	25
8	Wereyal, a being who stands in a flame (see also XI A 2 n and XI I 1 r)	24
29	Lewumunkowah, a sandbank with a deep hole in it in which carapaces of dead turtles accumulate.	13
28	Pihémweyang, a sandbank inhabited by so many birds that their flight casts a shadow over the whole bank.	12
25	Ponape*	9
22	Ngatik*	6

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20	Kapingamarangi*	4
16	Alelúnamarawayanpaluelap (The Great Navigator's Furled Sail), a rough area in the open sea shaped like a sail (see XI B 9, where it is described as a moss or seaweed with the shape of a furled sail).	32
15	Fayitárép (The Coral of the Sound of Surf), a coral head with waves breaking on it (see XI B 10).	31
12	Likiyapwér, a very big white bird of unknown kind.	28
11	Ratak*. T. regards Ratak as a single island, not the chain of the Marshalls known to us by that name.	27

The third place mentioned in the foregoing, Lewumunkowah, seems to be the same as the Lamonigoas of Damm<sup>(7)</sup> and the Mulegoas of the same author<sup>(8)</sup> by whom it is given as a small uninhabited place between Oroluk and Kusaie. Routes to this place intersect at 8° 6' N and 158° 44 E, which is just north of Ponape, though no reef is indicated there on the bathymetric chart.

### Looking Toward an Island from Ponape

9	Kusaie*	25
2	Lewumunkowah, mentioned above	18
1	Pihémweyang, mentioned above	17
28	Minto Reef*	12
27	Oroluk*	11
25	Truk*	9
23	Losap*	7
22	Namoluk*	6
21	Etal*	5
19	Lukunor*	3
18	Nukuoro*	2
16	Ngatik*	32

### Looking Toward an Island from Palau

27	Manina (Philippines)	11
25	Channel of Heleita (the place already discussed in II; see also XI A 3 p and XI J).	9
21	Angaur* (southern island of Palau)	5
20	Tobi*	4
18	Mapia*	2
6	Ngulu*	22
5	Yap*	21

## VI. THE GREAT TRIGGER FISH

### (*Pwuupwlapalap*)

Information on this system is from three informants, Y., H., and T. The image used by all three is one of a giant trigger fish (*pwuupw*). This

7. Damm 1935:95, 103.

8. Damm 1938:133.

fish, which is diamond-shaped, is visualised as lying in the water with the four angles of the diamond—head, tail, dorsal fin, and ventral fin—representing four geographical features that are alleged to be in a diamond-shaped relationship to one another. H. and T. add a fifth feature to the four of Y., this one being at the very centre of the diamond, which is called the backbone.

Y. has an alternative name for the system, “Backbone of the Trigger Fish”. H. calls it “Turning the Trigger Fish” and T. gives it the name “Trigger Fishes Tied Together”, the various names reflecting the different ways in which the three men imagine the fish to be oriented or moved from one place to another.

Y. describes only two positions of the fish, represented thus:

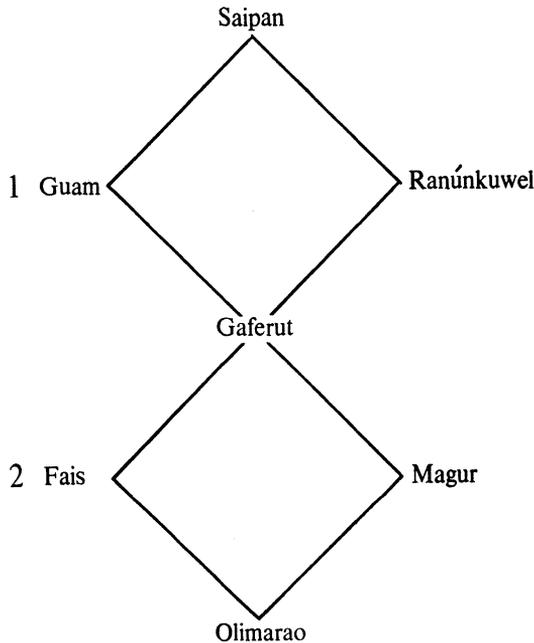


FIGURE 3

In position 1, Olimarao is shown at the ventral fin, Gaferut at the dorsal fin, and Fais and Magur at the tail and head respectively. Then Y. conceives the fish to be flipped over to the north, to position 2, so that it is seen upside down, the dorsal fin still being at Gaferut, but the other three angles of the diamond marking three new localities, as shown in the diagram. Needless to say, the diamonds, when laid out on a chart, in this case and in those to follow, form very rough diamonds indeed, geometrically speaking.

In Y.’s scheme, six of the seven places represented are islands, but the seventh, Ranúkuwel, is the place of the whale with two tails. This place

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and the creature located there have been noted already in Y.'s Sail of Limahácha (III) and occur again in X and XI D 15.

In H.'s scheme, there are four positions of the trigger fish. Three of them H. had already described to Gladwin; the fourth (the southernmost) he added later, saying to me that he had forgotten it before. They are:

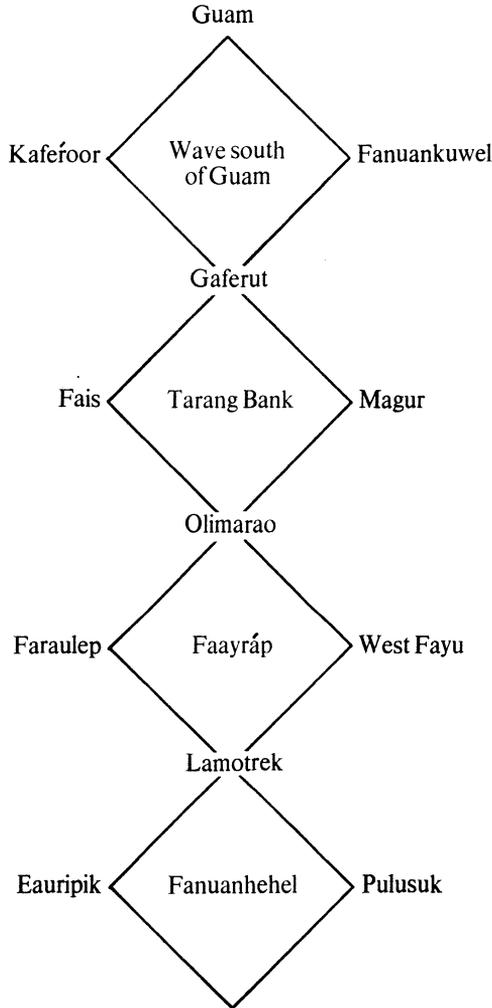


FIGURE 4

In the above diagram there are 11 places (counting Tarang Bank) which occur on standard maps. Of the others, Fanuankuwel (Land of the Kuwel, which is the name of a lizard) appears to be the same as the already noted Ranúkuwel, although Gladwin identifies it as an island north of Saipan. T., in the Trigger Fish which follows this one, calls it a ghost island, as he does in two other systems which will be explained below. The wave

south of Guam may be T.'s Nalikáp (see below). Faayráp is described as a reef here, but in XI B it is said to be an esoteric name for West Fayu. Fanuanuhehel (translated as "Land of coconut rope" by Y., and as "Land of plenty of coconuts" by X.) is mentioned again by Y. in XI A 2 C. H. locates it directly south of Olimarao.

T. visualises the Trigger Fish rather differently. He does not see one fish being turned over to occupy new positions; instead he conceives of a series of five fishes tied together in such fashion that they overlap, the dorsal fin of one coinciding in position with the backbone of the next fish to the north, thus:

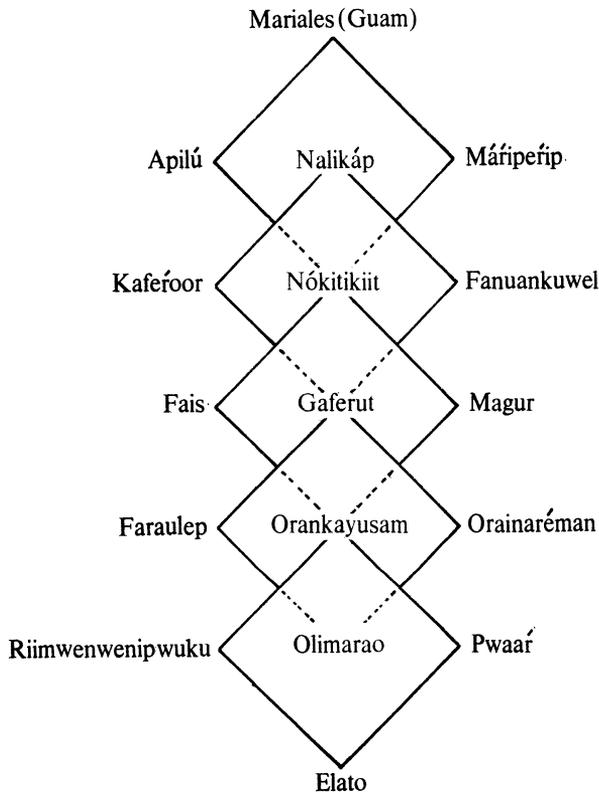


FIGURE 5

Of the 17 names given in this diagram, only seven are identifiable islands. Apilú is the personal name of a frigate bird which is seen in a rough water area at the point indicated. Nalikáp and Nókítikiit are big waves, Nalikáp the bigger of the two, and constitute sea-marks on the way to Guam. Máfipefip is a very big whale; its name, which means Small Pieces, refers to its reputation for destructiveness. (A place of this name also occurs in Y.'s XI C 3 b, but there it is identified as a sand bank). Kaferoor, which also occurs in the previous Trigger Fish by H., is a mythical vanishing

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island which is the subject of various stories among the Carolines; it is discussed more fully in XI C. Fanuankuwel we have already discussed. Orainaréman is another reef, and Pwaaf (Box) is a box-shaped one. Riimwenwenipwuku (Head at the Point) is a bank, shaped like a human head. At Woleai the name of the place is given by Alkire<sup>(9)</sup> as Chimul-wailibwegu and identified by him as Tarang Bank, and Burrows<sup>(10)</sup> gives it at Ifaluk as a small reef under Star 4 spelled Trimweliwelibwugu. The latter spelling again appears as a reef lying under Star 13 from Faraulep on the way to Olimarao, while in the reverse direction, Olimarao to Faraulep under Star 29, is given by Burrows as Simweliulibwugu.

Orankayusam is also a reef, said to be about half the size of Puluwat atoll, and is recognised by means of a red-tailed tropic bird which inhabits it. The equivalent Woleai name, Ochalgaiusam, is given by Alkire<sup>(11)</sup> as the backbone of one of the three Trigger Fishes that he illustrates. (He says that five are known to his informants at Woleai). In the same diagram the head, tail, dorsal fin and ventral fin are respectively Magur, Fais, Olimarao, and "Fayu" (presumably Gaferut), the dorsal and ventral fins being here reversed. The same place-name, Ochalgaiusam, is shown in one of Alkire's Breadfruit Pickers<sup>(12)</sup> at the eastern end of a course which runs east from the Philippines through Ngulu, Fais, and Faraulep. Krämer<sup>(13)</sup> refers to a Ralugoisong or Vorolegeisam, south of "Faiau" (Gaferut), and Burrows<sup>(14)</sup> has a Raligousam reef under Star 6 from Ifaluk and a Religousam under Star 25 from Faraulep. These all appear to be the same place and suggest the existence of a reef just east of Tarang Bank. If so, Alkire's Trigger Fish described above would be identical with the one given by H. in second position from the north.

In learning each Trigger Fish diagram, according to T., you imagine yourself sailing west to the tail, under the setting of Altair, back to the centre (the backbone) and then due east to the head, then back to the centre and south under the Southern Cross to the ventral fin, back to the centre and north under the North Star to the dorsal fin, and finally back to the centre again. Each Trigger Fish is thus seen to be oriented approximately according to the four cardinal points of the compass. H., however, says that the islands at the head and tail are not expected to lie in a line at right angles to the north-south axis. In reciting the system, T. says, you actually begin at Puluwat and go from there to Satawal, Lamotrek, Elato, Olimarao, and then Orankayusam, where you are at the beginning point of the Trigger Fish system. You would begin at Puluwat, no matter where you lived. T. first gave me the four northernmost fishes, beginning with Orankayusam, and proceeding northwards, describing each fish in turn. The southernmost fish he added later, as a kind of afterthought.

All three men, Y., H., and T., say that the Trigger Fish system is only a teaching device. Its purpose is to remember how the various places

9. Alkire 1970:46.
10. Burrows 1957:94, 340, 342.
11. Alkire 1970:51.
12. Alkire 1970:50.
13. Krämer 1937:124.
14. Burrows 1957:94, 339.

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covered by these imaginary fishes are oriented in relation to each other. H. adds that it is used only in travel to and from the Marianas. Strangely enough, Gladwin's notes record that I., a prominent navigator, had never heard of this system and did not recognise it when it was described to him.

VII AYÚFÁL'S TAIL  
(*perán ayúfál*)

The reference to a tail in this metaphor is obscure, and no more is known of Ayúfál than that it is the name of a spirit. But the system as explained by T. has to do with an ocean area between Truk and the Hall Islands which is always turbulent, even when the sea is calm all around it. This rough-water area, about the size of Puluwat Island, is shaped like a fish whose tail points approximately north-west, its head approximately south-east. If this fish-shape is in the imagination much expanded in all directions it is said to cover an area which includes:

Namoluk at the upper jaw;  
Losap at the lower jaw;  
Oroluk at the dorsal fin;  
Truk at the belly;  
Murilo at the upper point of the tail;  
Pulusuk at the lower point of the tail.

Between the two points of the tail, forming the tail's outline, from Pulusuk to Murilo, are the following, in order: Puluwat, Tamatam, Pulap, Ulul, Magur, Ono, Onari, Piseras, East Fayu, Nomwin, Fananu and Ruo.

If a line can be drawn on the map connecting all these places, using curved instead of straight lines in some places, a much-distorted but still recognisable fish-form results, supposedly congruent to the shape of the rough water area of which it is intended to be a magnification.

Exactly how the system functions is not entirely clear, but apparently if you were in the area of turbulence and wished to go to one of the islands which form the outline of the magnified fish-shape you would go to the spot on the smaller fish which represents that island and set course from there, under the appropriate star. Star courses for all the islands are given in this system. But, T. adds, you would not be in the fish area unless you had lost your way or had drifted there.

VIII ALIGNING THE SKIDS  
(*hélong*)

This is again a schematic image, this time a row of six whales lined up like the skids used to launch a canoe, according to T. Their heads and tails point north and south. All are called by the same name, Big Skid. The row of whales forms a line from Puluwat westwards, on the bearing of Star 23, to Eauripik. Each whale is positioned about one day's sail directly south of an island, as follows:

Whale 1	South of Satawal
Whale 2, with a more pointed head than No. 1	South of Lamotrek

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Whale 3, with a wider tail	South of Elato
Whale 4, white	South of Olimarao
Whale 5, accompanied by another whale only as long as a man's forearm	South of Ifaluk
Whale 6, only one fluke on each side	South of Woleai

The narrator of this system begins with an imaginary canoe at Puluwat, sails under Star 23 to the first whale, turns north to Satawal on Star 1, back south to the same whale on Star 17, west again on Star 23 to the second whale, north to Lamotrek on Star 1, back south again to the whale on Star 17, west again to the third whale, etc., all the way to Eauripik.

The purpose of this system, T. explains, is to re-orient oneself when lost by means of recognising one of these whales. He himself has never seen one because they are south of any direct route between islands, but he knows of a case in which a canoe which had strayed far to the southwards did see the whale who lives south of Elato and so was able to save itself.

### IX THE FORTUNE TELLING OF THE SEA BASS'S FOOD (*ripwán ánen áliayr'é*)

One way to foretell the future on Puluwat is by means of folding coconut leaflets back and forth and reading events to come by the length of the last fold. In the system here employed, the image is of the midrib (*ripw*) of the leaflet, folded in this fashion and then allowed to spring partially open again so that it looks like a zigzag, each angle at about 45 degrees. The imaginary course which is followed in this system is a similar though asymmetrical zigzag. The significance of the figure of speech involving the sea bass and its food is not clear.

The zigzag course is simultaneously a circular one, since it starts and ends in the same place, Pulusuk. It does this, T. thinks, because the system may have originated at that island. In the description which follows, each place mentioned has a name, given also in translation where possible:

From Pulusuk\* under Star 30, to:

1. Pukuelailai (Long Bent Knee), a bank, so called from its shape, in the southern part of Manila Reef; thence to:

2. Apilepil (Heel), another bank named from its shape, this being the south-western part of the northern half of Manila Reef; thence to:

3. Lúl (Breaker), the Lulunna of the map, so named because of the waves breaking over this reef. Thence:

Under Star 4, to Puluwat\*. Thence:

Under Star 30, to:

1. Raikániang (Fish of Iang, which is the name of the space of water between Puluwat and Ruat); this is a whale of the same species and appearance as the second whale of VIII, Aligning the Skids, but smaller, about the size of a paddling canoe and with the upper fluke missing; thence to:

2. Lééniwór (Reef Pond), so-called because it consists of a school of bonito churning about in a circle and producing frothy water like the water running over a shoal; thence to:

3. Ruat, which is apparently southern Gray Feather Bank (see III, The Sail of Limahácha). Thence:

Under Star 4 to:

1. Ééyilipón (pón: murky water), where a shark lives, visible only occasionally because of the cloudiness of the water; thence to:

2. Méfupul (pul: flame-colour), a bank, identified by a flame-coloured fish, four feet long, of species mwénitaw; thence to:

3. Ulul\*; thence to:

4. Magur\*.

Under Star 14 to Piseras.\*

Under Star 13 to Truk;\*

Under Star 22, return to Pulusuk.\*

#### X THE TORCH OF THE LAGOON OF ANÚÚFA

(*túliiy léén anúúfa*)

On this imaginary journey, a torch is carried by the narrator, who is T. in this account, while he seeks for fish of various kinds and sometimes other things. The narrator starts from the lagoon of Anúúfa, that being the name of a certain spirit. The lagoon is that of the mythical island of Fanuankuwel, already mentioned. T. carries the torch from there to a whole series of places, each under a different star, around the compass. He begins with Star 21 and proceeds counter-clockwise, as with the system called Looking Towards an Island, making his voyages each time under the next star until the last, No. 22. On each such trip he captures his prey by the light of the torch and returns to the ghostly lagoon under the opposite star.

Although all of the voyages around the compass are made from the Lagoon of Anúúfa, the narrator must first get there from Magur, for the system begins at Magur, where it was invented. And, T. adds, before it can begin he must first get to Magur from Puluwat. So he first gives the course from Puluwat to the Lagoon of Anúúfa via Magur, as follows:

Under Star 5 from Puluwat to Mótolap, which is the space of water between Tamatam and Pulap. From thence the narrator proceeds:

Under Star 4 from Mótolap to:

1. Ametákit (Small Fiber), the narrow middle part of the bank which runs from Pulap eastwards;

2. Fainiyááh (Upper Coral), a large and dangerous coral shoal on the southern reef of Namonuito between Ulul and Piseras, so named because it is spoken of as lying above Ulul;

3. Magur\*. This is where the system begins. From here, still under Star 4, the narrator passes on the way to the Lagoon of Anúúfa the following:

4. Yolomwár (Yellow Garland), a fish of the species howólól, this individual being yellow;

5. Riginiól (Different Yellow), a second fish of the same species but less yellow in colour;

6. Aniól, a yellow heron flying about;

7. Lisileru, a black heron flying about;

8. Rórfóf (reduplication of Black), a flock of mwi plovers.

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9. Ererremwar (Garland Stalk), a stem and cluster of coconuts floating on the water (see XI C 4 a);

10. Márikorik (Dimly Seen), a high-flying frigate bird with a white spot on its underside;

11. The Lagoon of Anúúfa. Now the narrator lights his torch and proceeds to the series of places described below, each time symbolically catching whatever fish or other creature is mentioned in the description and returning with it to the Lagoon, the voyage being made in each direction under the stars indicated.

Under Star No.:	To:	Return under Star No.:
21	Luginóm (Outside of Atoll) a very big whale with two heads; is of the abinuhehál species, which has a pointed head.	5
19	Hagúrpwar (Bent Back), a coral mass in the open sea with waves surging over it, shaped like a bent human back; the coral and all the fish around it are taken back to the Lagoon of Anúúfa.	3
18	Ono*. All the fish are caught and taken back.	2
17	Onari*. Fish.	1
16	Piseras*. Fish.	32
15	East Fayu*. Turtles.	31
14	Nomwin*. Fish.	30
13	Fananu*. A momerik fish.	29
12	Ruo*. Fish.	28
Between 11 and 12	Murilo*. Fish.	Between 27 and 28
11	. . . (name forgotten, T. says). A small piece of the faeces of Anúmwérikí, a spirit of navigation. The faeces are brought back.	27
9	Piyailiyarán (Sandbar of Day-Woman, her name), a sandbar. Fish.	25
7	Ikeram (Orange-coloured Fish), a fish of mwén species; this species is a reef fish, but this individual is in the open sea.	23
6	Ikiól (Yellow Fish), a fish of wómeý species.	22
5	Ikepar, a fish of parepar species, again ordinarily a reef fish except for this individual.	21
3	Lapwútmetau (Sea Eel), a rare species.	19
1	Nawurumetau, another eel, gray with spots, ordinarily inhabits reefs.	17
32	Lidádápeřow (Solidified Sand Boatman), a human being using a canoe made of concreted sand. This person is caught and brought back, like all the other things mentioned.	16

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- 31 Liwawaróluk (Fern Boatman), a human being using a 15  
canoe made of róluk fern. He is caught and brought back.
- 29 Fanuanmeiram (Land of Orange Breadfruit), an island 13  
said to be near Saipan which looks as though lit up by  
fire instead of sunlight (a reference to the volcanic islands  
of the Marianas, Guguan or Pagan?) All the fish are caught.
- 28 Fanuannúram (Land of Orange Coconuts), an island 12  
said to be near Guam, east of it. All the fish are caught.
- 27 Árikmetau (Árik-crab of the Sea). Árik is a small white 11  
beach crab, but despite the name the reference is to a large  
sea crab of yáíláp species which has one normal claw and  
one paddle-shaped claw (see XI H 3 j).
- 26 Péféru (Tail Joined), a whale with two bodies and one tail. 10
- 25 Péfémwéri (Wonderful Tail), whale with one body and 9  
two tails (See III and VI).
- 24 Ikamóyang (Bobbing Fish), a whale in vertical position 8  
whose head keeps bobbing up and down at the water's  
surface.
- 23 Ikamwéri (Wonderful Fish), a bonito with a whale's tail. 7
- 22 Rápowiluk (Flapping Wings Outside), a sting-ray of 6  
fááfiyap species, black, but this individual has white spots.  
"Outside" means outside of the lagoon. This creature,  
like all the previous ones, is caught and brought back.

The only identifiable places given above, after the narrator reaches the ghostly lagoon, are eight islands in Namonuito atoll and the Hall Islands. The other places, except for a coral mass, a sandbar, and two alleged islands in the Marianas are sea-life, all more or less fantastic. (The frequently used "yellow" in the descriptions, incidentally, does not always mean that colour; sometimes it means the sun, and sometimes it is used only to embellish a word, being regarded as a rather elegant suffix).

The ghostly lagoon may, of course, be a real phenomenon. It is described as being in the sea but resembling a real lagoon, which may possibly refer to a difference in the appearance of the water over a sunken reef. The bearing given on Star 4 from Magur to the ghost lagoon, and the return voyages to the lagoon on the bearings given from the other eight islands mentioned above, were laid out on a chart. So were also whatever data are provided by the descriptions of the Land of Kuwel and its ghostly lagoon as given in III, VI and XI D 15. Also included in the projections was the similar system given by Damm<sup>(15)</sup>. By adding a half-star possible error to each route and ignoring the deviant data that put the ghostly island far to the north, a number of intersections resulted within a one-degree radius of 150° 35' E and 9° 39' N. However, there is no indication on the bathymetric charts for this region of any phenomenon to support the idea that the ghostly lagoon is more than pure imagination.

The Torch of the Lagoon of Anúúfa resembles three other systems employed at Puluwat in its method of exposition: namely in the descrip-  
15. Damm 1935:100.

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tion of phenomena radiating out in straight lines from a central place under the various stars around the compass. This is done in Looking Toward an Island, as described earlier, naming an island under each star. It is done again in Sea Life (pukoof), a system about which I did not obtain detailed information but which is fully set forth in Gladwin,<sup>(16)</sup> it consists of inventories of fauna, objects, reefs, fabulous creatures, and anything else except islands to be encountered in the radiating courses. And in the third case, the Breadfruit Picker of the Chief of Kafefoo (XI C and XI D), the same technique of description is used though it is less perfectly developed. In this last example, the inventories of phenomena include both islands and sea life, as with the Torch of the Lagoon of Anúúfa, being a combination of the other two. There is also a similarity between Anúúfa and Kafefoo in that desirable objects are secured at each place mentioned under the stars and returned to the central place. And while Looking Toward an Island and Sea Life are systems applied to every island, The Torch of the Lagoon of Anúúfa and the Breadfruit Picker of the Chief of Kafefoo are applicable only to those two places, both of them mythical.

### XI THE LASHING OF THE BREADFRUIT PICKER

(*fééyah*)

On Puluwat, as elsewhere in the Carolines, breadfruit are gathered by means of a long pole, to the upper end of which is lashed, at a narrow angle, a short stick used to hook the stem of the fruit. This tool is used as a metaphor in expounding a very extensive category of geographical information. In the imagination of the navigator, a breadfruit picker reaches out in a straight line under a particular star to one place after another till it turns in a new direction under another star or till it finally exhausts the inventory of known places, real or imaginary, under a star and comes to the end of the known world. The inclusive term for such inventories is the Lashing of the Breadfruit Picker, but the many inventories included in this category all have their own names.

As explained elsewhere, the courses given in this system under particular star bearings are much wider than those given in the other systems, the bearings including not just the named star but one star to each side of it. Nevertheless, Y. insists that the Breadfruit Pickers are useful in practical terms, and are not just techniques for learning geography. Y. described three Breadfruit Pickers; T. named seven. Only one of Y.'s Pickers corresponded in name with one of T.'s, and in no case was there close correspondence in detail of information. All three of Y.'s examples are described below. T.'s account was interrupted in the middle of his fifth Picker by the arrival of the ship in June, 1967, which carried me back to Truk, and we were not able to complete the recording. The two other Pickers that T. said he knew, and on which I have no information, he named as the Breadfruit Picker under Cassiopeia and the Breadfruit Picker under the Rising of Delta Crucis. In addition to Y.'s and T.'s inventories, I give five unnamed Breadfruit Pickers from Gladwin's notes as recorded

16. Gladwin 1970:204-207.

from H. and I. Alkire<sup>(17)</sup> describes four more of these inventories, which he calls Pole Charts, all from Woleai. None corresponds closely with those from Puluwat. All four of them run in a straight line, three under Star 9 and one under Star 6. (Of the 13 Pickers from Puluwat described below, two of Y.'s three, all five of T.'s, one of H.'s four, and the one given by I. follow more than one star).

A. The Breadfruit Picker outside Pulusuk (by Y).

This Picker is extended successively in three directions. Y. described it as forming a triangle, but the last of the three courses actually does not return to the island from which the Picker was first extended so as to close the triangle. The narrator stands on Pulusuk and reaches out with the Breadfruit Picker directly south:

1. Under Star 17 from Pulusuk to:

- (a) Rakomar, where a mwi plover lives, thence to;
- (b) Rénimán, a breadfruit leaf floating on the water;
- (c) Nápwilhálong (Fishing Towards the North), a group of birds of various species flying north (see XI E 5 e);
- (d) Súlong (Flying North), a kuling plover flying north (probably the same as XI E 5 c);
- (e) Nápwilháwow (Fishing Southwards), a group of birds flying south (see XI E 5 d);
- (f) Súwow (Flying South), a kuling plover flying south (probably the same as XI E 5 b);
- (g) Lámeirang, a very large shark with a dorsal fin the size of a canoe sail;
- (h) Iraitéf, a whirlpool;
- (i) Piyáifek (Sandbar of Deliberation), a sandbar;
- (j) Piyailam (Sandbar of Sudden Thought), a sandbar;
- (k) Piyánuriyól (Beautiful Sandbar of Enjoyment), a sandbar; (see XI G 3 d and XI I 3 j, but these cannot be the same places, for in this case it lies south of Pulusuk; in XI G 3 d it is south and a little east of Mahang, which is supposed to be somewhere in the Marshall Islands, and in the third case it is west of Gaferut);
- (l) Piyánurungáni (Sandbar of Company);
- (m) Piyánwowyól (Sandbar of Looking at Loveliness; see XI G 3 c);
- (n) Léénmwarenima (Pond of Flotsam at Gap-Between-Banks), a place in the sea where floating objects collect and are held by the currents; small plants will grow on them (see XI G 1 m);
- (o) Iifú (To Seek, To Examine), an uninhabited island. Also recorded as Iroh from Y. and from X., and as Iros from H. and T. (see XI C 6 e, where, however, it lies not south of Pulusuk under Star 17 as here but under Star 12). It is also mentioned by Damm<sup>(18)</sup> and elsewhere in the Südsee-Expedition volumes. Supposed to be near New Guinea, although X. thinks it is an islet of Kapingamarangi atoll.
- (p) Taam (Helper), an uninhabited island, said to be near New Guinea. Also recorded as Fanuaitaam from H. Basilio, my interpreter, thinks it is the same as Damm's Iramadam.

17. Alkire 1970:50

18. Damm 1935:94-5.

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2. Under Star 4 from Taam to:

(a) Fanuanngóngó (Land of Grotesque Faces), an island; also mentioned by H. as lying far to the south-west see XI I 3 c.<sup>(19)</sup>

(b) Fanuanngúngú (Land of Mutes; “they just say ‘ng, ng, ng’ ”); an island;

(c) Fanuanuhehel (Land of Coconut Rope, or Land of Plenty of Coconuts), an island (see VI);

(d) Fanuanióng (Land of Turmeric), an island;

(e) Fanuanimwar (Land of Chaplets), an island (see XI G 2 b);

(f) Fanuanimótiw (Land of Red Spider Lily), an island (see XI G 3 a);

(g) Fanuanikióp (Land of White Spider Lily), an island (see XI G 3 b);

(h) Pianyópule (Sandbar of Ópule, Ópule being a Nukuoran word according to Y., the name of a spirit according to T.; see XI F 1 d);

(i) Pisisawiróch (Sandbar of Dark Trumpet Shell); given by Y. in Trukese dialect; see also XI G 2 c, where T gives it in Puluwat dialect as Hawifór, but there it is called an island rather than a sandbar. Krämer<sup>(20)</sup> mentions a cognate form Saúirodj at Lukunor, calling it an island lying under Star 14 between Pulusuk and Kapingamarangi; that course and the one given here would intersect at 153° 45' E and 2° 10' N, about midway between Nukuoro and Kapingamarangi and 1° 15' west of a north-south line between those two islands.

(j) Piyamaramar (Sandbar of the Garland), so-called from its shape (see XI F 1 e);

(k) Nukuoro\*;

(l) Naikchar, the esoteric name of the liipaaow snapper fish, yellowish with a brown spot on each side (see also XI B 6; possibly XI E 5 f is also the same);

(m) Raikiól (Yellow Fish), a yellowish whale;

(n) Wéfeeyól (Eyes Wide Open With Surprise, plus Yellow), a ghost of human appearance which disappears as it approaches. Perhaps the same as Wereyal, the being which stands in a flame, in V; also the spirit Wereyón of XI I 1 r; but both of these are east of Kusaie, while this ghost is west of it.

(o) Mokillewórar (Mokil of Raw-Meat-Eating). Y. says this is the Mokil\* of the maps. However, H. makes it Mokil of Cannibalism and locates it in New Guinea (Lukini), though New Guinea seems to mean everything along the northern border of Melanesia west and includes the eastern part of Indonesia. X. says Mokil and Mokil of Raw-Meat-Eating are different places, the latter being further east (perhaps Pingelap?).

(p) Mokillepwangepwang (Mokil Loosely-Tied). Y. thinks this is Pingelap\*.

(q) Peleeyta, an island north-east of Ponape (see also XI I 1 n, XI G 2 k, and XI H 3 b);

(r) Fanuainat (Land of the Nat Beach Shrub), an island (see XI G 2 h);

19. Also Damm 1935:95.

20. Krämer 1935:103.

(s) Fanuachen (Land of the Chen Tree), an island (see XI G 2 g);  
 (t) Mahang, thought by Y. to be Ocean Island or one of the Marshalls.  
 Given by T. as north-east of Kusaie. According to T., this is a land of very big coconuts and very tall people, which corresponds somewhat to Damm's description of it as a mythical world inhabited by giant beings<sup>(21)</sup> (see also XI G 2 l and XI I 2 c).

3. Under Star 25 from Mahang to:

(a) Peinwólák (Rubbish of Cuttings), a place in the water where leaves, grass, etc., cut at Ponape gather. Somewhere west of Ponape (see XI H 3 d).

(b) Úúwéúw (Pile of Floating Debris), differing from the preceding in that the vegetation is less fresh and was not cut. Somewhere north of Ponape. See also XI H 3 c and XI I 1 p. The name úúwéúw is undoubtedly the same as the one Gladwin recorded from I. in XI I 1 p, úúwow, but he gives it there as the name of an island.

(c) Peinimwár, a school of uwei fish;

(d) Oranamahokil (Reef of amahokil parrot-fish), reef inhabited by this species;

(e) Orailigárigár (Reef of ligárigár fish), a reef;

(f) Oranimám (Reef of mám fish, a kind of wrasse), a reef;

(g) Sol\*, the islet in the northern part of Murilo atoll. This uninhabited place, which is real enough, is so insignificant that one wonders why it is singled out for mention in the Breadfruit Pickers among the hundreds of other such uninhabited islets; yet it is found again in XI I 3 d and XI J 15. Perhaps it is because it lies next to a pass through the reef of Murilo.

(h) Rófóróf (Impatient), 7 or 10 (Y. is not sure which) mwi plovers. The same word occurs in X, The Torch of the Lagoon of Anúúfa, where T. translates it as a reduplication of róf, black, but it must be the same, for this is also a flock of mwi plovers.

(i) Magur\*;

(j) Ráchebai (Still Wings), a soaring frigate bird;

(k) Fais\*;

(l) Ikomwólék (Scratching umwólé fish, per Y., School of Lek fish, per T.) Two umwólé fish, a kind of small skipjack which can sting. When small are called lek. See XI D 6, where a whole school of the fish occurs, also XI H 5 c, XI I 3 k, and XI J 3.

(m) Ikopwér (White Fish), a white whale. But in XI H 5 d this is a yár fish and in XI J 4 it is a white trigger fish.

(n) Ikóréf (Black Fish), a black whale. But in XI H 5 e this is a sort of black reef fish and in XI J 5 a black trigger fish.

(o) Meyang (Breadfruit Work), a limweeyngaw heron which ordinarily lives only on land (see XI H 5 h).

(p) Tawheleita (Channel of Heleita), already discussed in II and V (see also XI J).

(q) Tawailiyáf (Channel of Ailiáf, see II);

(r) Naihaniwa, a coral head (see II and XI H 5 i);

B. The Short Breadfruit Picker (by Y.)

21. Damm 1938:106.

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There is only one star bearing for this course, which is a very short, unidirectional one. It begins with West Fayu (as it is set down on the maps, or Pigailo as it is known to most of the central Carolinians, but Faayfáp is its esoteric name). The picker is extended from West Fayu under Star 12 to:

1. Puluwat\*;
2. Nemekireng (Lightly-applied Turmeric Powder), a likirowuf plover with pink-yellow legs and beak. But in XI F 1 c the same place is where a light-yellow lihingér gull-like bird lives.
3. Aiyúkúnimwar (White Tailed Tropic Bird with Necklace), a bird of that description, the necklace referring to a black ring around this individual's neck (see also XI F 1 b). These last two items occur in reverse order in XI F 1.
4. Waihomá (Canoe of Homá, who is a spirit). This is a floating tree trunk with six knobs on it which look like people. In Gladwin's notes on the Sea Life system (pukoof) H. describes a large piece of driftwood with three human-like protuberances on it, but it is under Star 7 from Puluwat, and in his notes on the same subject from I. there is a large log with four such branches, but under Star 6.
5. Namoluk\*;
6. Naikihar, esoteric name of liipaaow snapper (see XI A 2 1: possibly XI E 5 f is the same too).
7. Yafang (His Leap), a school of porpoises;
8. Likósu, a large mánuwó bird;
9. Alelúnamara (Furled Sail), a quantity of moss or seaweed shaped like a sail which is furled and tied to the booms of the canoe (see V).
10. Fayitárép (The Coral of the Sound of Surf), a coral head in the open sea being pounded by surf (see V).

### C. The Breadfruit Picker of the Chief of Kafefoor (by Y.)

We now have to deal with the mysterious island of Kafefoor. It must be stressed that this is not the same place as the Gaferut of the maps, although the word is the same. (The final consonant, *r* in Puluwat and *ch* in Truk, becomes *t* in some of the Caroline Islands further west). Through much of the central Carolines the name in one form or another is applied to an island which supposedly vanished, together with its people, early in the time of the Spanish occupation of the Marianas. There are many versions of this story, some published in the several volumes of the *Ergebnisse der Südsee-Expedition*, but the consensus is that the people of Kafefoor, who were similar to those of Yap in language and culture, decided to disappear together with their homeland rather than have anything to do with the Spanish, about whom they had heard.

Kafefoor is sometimes identified with Hunter Reef, just north of Yap, but Carolinians put it considerably further north and somewhat more to the east. In the two versions of the Breadfruit Picker of the Chief of Kafefoor—this one by Y. and the one which follows it, XI D, by T.—some 23 of the courses given are from Kafefoor to known islands, involving 11 positions of the stars, and can be back-charted from them. (I omit the course given back from the Philippines, that being too large an area to

use). As described earlier, these courses are narrated in terms of the middle of three stars. The projections back from the named islands are therefore pairs of radii which produce arcs. There is a point of intersection which is included within all of these sets of rays; it falls at about  $11^{\circ} 32' N$  and  $138^{\circ} 47' E$ , which is indeed north and east of Yap, as the Puluwat Islanders say it should be. However, there is no natural phenomenon apparent on bathymetric charts which can account for the myth of a sunken island nearer to this point than 40 minutes to the south-east, where a bank of 25 fathoms depth appears.

There are plenty of imaginary reference points in the native navigational methods. Besides those enumerated in this paper there is the unique system of *etak* described in Gladwin's book. But why the Puluwat navigators should have chosen two mythical places—Kafefoor and the already discussed Lagoon of Anúúfa (see X)—as centres from which to describe radiating courses, exactly as they do with real islands, remains mysterious.

A point about the uninhabited island called Gaferut on the maps: this place is known to Carolinians by quite another name, Fayu. The next uninhabited place to the east, the West Fayu of the maps, is called Pigailo by the people of Puluwat. And still further east is the uninhabited island shown by European cartographers as Pikelot; it is known by that name on some of the islands west of Puluwat, but at Puluwat and some other places it is called Pik. How this extraordinary misplacement of three islands came about is a subject for further investigation, but it goes back at least to the early nineteenth century explorers Kotzebue, Duperrey and Lütke. As a guess, perhaps Kafefoor was named by a Carolinian navigator and was taken by his European auditor to mean a real place; then, having the task of fitting four names (Kafefoor, Fayu, Pigaelo, and Pik) to three charted islands on the northern fringe of the Carolines, he pushed the set of four one place over to the east, and the names Pik and Pigaelo somehow coalesced with Pikelot.

Y.'s Breadfruit Picker of the Chief of Kafefoor follows:

1. The picker is extended by the Chief from Kafefoor under Star 19 to all of the following places in turn, each time gathering a local product in the name of and for Paluelap, the Great Navigator:

- (a) Yap\*, where all the sweet potatoes are gathered;
- (b) Helen Reef\*, where all the giant clams are gathered. (Helen Reef is for some reason given much too far north, its proper position being south of the next two places mentioned). Then to:
- (c) Pulo Anna\*, for all the flying fish;
- (d) Merir\*, for two long tail-feathers from each of the roosters, for decoration, Merir being famous for the length of its roosters' tails;
- (e) Lumaráp (Nearby Seaweed), a place in the water; the seaweed is gathered. See XI H 5 a and XI J 2, where this place is given as due west of Yap, while here it is far to the south, unless the sequence of the last four places is reversed.

(f) Lumatoow (Distant Seaweed), similar to the last but further away; see XI H 5 b and XI J 1, these again being west of Yap.

2. The picker is now extended from Kafefoor under Star 25 to:

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- (a) Ápepei (Floating Object), twelve boobies standing on a floating object; the group of birds is called Araawa; they are gathered by the picker;
  - (b) Palau\*, where stone money for Yap is gathered.
3. The picker is extended again from Kafeoor under Star 4 to:
    - (a) Ikánur (Wandering Fish), a red snapper, which is gathered;
    - (b) Máripefip (Small Pieces), a sandbank where the picker gathers tilipwu fish (see also VI).
    - (c) Saipan\*, for sweet potatoes.
  4. Under Star 9 to:
    - (a) The Lagoon of Anúfa (see X). A scorpion fish with the personal name of Ererremwar (Garland Stalk) is gathered here; but see X 9, where the name applies to a floating stalk and cluster of coconuts; the scorpion fish is so named because it allegedly resembles such a cluster. The word "garland" in both cases is honorific.
    - (b) Malórewa (Thin Hair Oil Spreading), a place of floating objects surrounded by a large calm area; the floating objects are gathered.
  5. Under Star 11 to:
    - (a) West Fayu\*, for turtles;
    - (b) Puluwat\*, for afur fruit;
    - (c) Ténoraayéf, given here as the name of a reef island south of Uman atoll in Truk, but defined elsewhere as the collective name of all the southern reef islands of Truk. This place is said to be well known for trolling for pwayéf fish, which the picker gathers here.
    - (d) Nama\*, said to be well known for the size of its coconuts, which are now gathered.
  6. Under Star 12 to:
    - (a) Satawal\*, for tuna;
    - (b) Ikemwanolóng (Fish Hiding Within), for a mám wrasse;
    - (c) Folótmaan (Struggling Creature), for a moray eel;
    - (d) Pulusuk\*, for breadfruit;
    - (e) Iroh, an island (see XI A 1 o).
  7. Under Star 13 to:
    - (a) Olimarao\*, for Cyrtosperma;
    - (b) Lamotrek\*, for all kinds of line-caught fish.
  8. Under Star 14 to:
    - (a) Faraulep\*, for fermented palm toddy;
    - (b) Lamoliur\*, for coconut crabs.
  9. Under Star 15 to:
    - (a) Ulithi\*, for Alocasia;
    - (b) Fais\*, for sharks and tobacco;
    - (c) Eauripik\*, for sprouted coconuts.
  10. Under Star 16 to:
    - (a) Ngulu\*, for giant clams;
    - (b) Sorol\*, for wérik fish.
  11. Under Star 17 to Sónsorol\* for flying fish.
  12. Under Star 1 to Apúngun Imwan Haw Kafeoor (Door of the House of the Chief of Kafeoor), a place in the sea where butterfly fish occur; these are gathered.

13. Under Star 3 to Neyópw (Skiilúkipjack Outside, i.e., outside of Guam, this place supposedly being just west of that island); the picker collects a school of skipjack.

D. The Breadfruit Picker of the Chief of Kafeóor (by T.)

Although this system bears the same name as the preceding one by Y. and although both use the concept of drawing food or other things back to Kafeóor, there is little correspondence in descriptive detail. T.'s description is briefer and he swings around the compass only once, from Star 21 counter-clockwise and back as far as Star 24, while Y. goes clockwise from Star 19 around the compass till he passes No. 19 again and ends at No. 3. Also, T. says that the system actually begins at Fais, although the picker is not stretched out until after reaching Kafeóor, and before that he gives courses to get from Puluwat to Fais. Beginning at Puluwat, he goes:

1. Under Star 25 to:
  - (a) Ééynipuk, a frigate bird flying about. The last syllable, puk, of this word is the name of the intersection of the route from Pulusuk to Pikelot and the route from Puluwat to Satawal, which is being followed here; Puk is recognisable from no physical evidence other than this bird.
  - (b) Haw Weniméng (The Chief of Weniméng), that being the name of the northern point of Satawal Island, guarded by a frigate bird which accompanies a mixed flock of other birds.
  - (c) Satawal\*;
  - (d) Lamotrek\*.
2. Under Star 26 from Lamotrek\* to Elato\*.
3. Under Star 25 again from Elato to:
  - (a) Puguwai Tagular (Swordfish Point); a swordfish lives on each side of this sandbank point;
  - (b) Hanefaimó (Gravel Area), a bank of the description indicated, perhaps in the southern part of Gamen Reef\*;
  - (c) Ifaluk\*;
  - (d) Woleai\*.
4. Under Star 29 from Woleai to:
  - (a) Uruwa (Wandering Canoe), white terns in flock shaped like a canoe. Uruwa, here translated as Wandering Canoe, is also given by Alkire<sup>(22)</sup> as a large tropic bird with red feet, under Star 31 from Woleai.
  - (b) Fais\*, where T. says the system now begins.
5. Under Star 27 from Fais to Kafeóor. From now on the image is again employed of the Chief of Kafeóor with his breadfruit picker which hooks different objects in various places and draws them back to him, proceeding around the compass.
6. Under Star 21, Kafeóor to Ikomwólék (School of Lek Fish; see XI A 3 l, XI H 5 c, XI I 3 k, and XI J 3). The picker gathers these fish, takes them to Kafeóor, then goes:
7. Under Star 20 to Ripwenkamar (Bent Tongs), a sandbank of V-shape, where fish of all kinds are gathered, then from Kafeóor:

22. Alkire 1970:45-6.

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8. Under Star 19 to:
  - (a) Yap\*, for sweet potatoes;
  - (b) Ngulu\*, for breadfruit.
9. Under Star 16 to Sorol\*, for ripe coconuts.
10. Under Star 15 to Eauripik\* for drinking coconuts.
11. Under Star 14 to:
  - (a) Ulithi\* for sweet potatoes;
  - (b) Falalis\* (in Woleai atoll) for breadfruit.
12. Under Star 13 to Woleai\* (presumably the whole atoll) for breadfruit.
13. Under Star 12 to Falalap\* (in Woleai atoll) for ripe coconuts.
14. Under Star 11 to:
  - (a) Fais\* for sweet potatoes;
  - (b) Pulap\* for Colocasia;
  - (c) Nama\* for papayas.
15. Under Star 9 to Fanuankuwel (The Land of the Kuwel Lizard) for all the fish there (see III, VI, and X).
16. Under Star 5 to Mariales (Guam) for all the food there. Then, after each time returning the foods mentioned to the Chief of Kafefoor, the breadfruit picker is extended once more from Kafefoor:
17. Under Star 24 to Manina (Philippines) to get tapioca and bring it back.

### E. The Breadfruit Picker of Pagurer (by T.)

All that T. knows about Pagurer is that it is the name of a spirit. In this and the pickers remaining to be described there is no bringing back of any goods, only the stretching out of the tool. This one begins at Puluwat and is extended:

1. Under Star 4 to Ono\*. Thence:
2. Under Star 22 to:
  - (a) Ulul\*;
  - (b) Pisiya, a sandbank south-west of Namonuito (see III);
  - (c) Ailail (Connecting), referring to a bank between two other banks;
  - (d) Wownipik (Looking at Pikelot), a reef which begins at that island, no doubt Conдор Reef;
  - (e) Oranipwópw (Reef of the pwópw Shark) (see XI L 1 c, where it is described as about 20 miles west and north of Pikelot);
  - (f) Lamotrek\*;
  - (g) Uniwor (Standing Reef), a barracuda which lies at right angles to its usual orientation and hovers over a dimly seen, deep reef;
  - (h) Eauripik\*;
  - (i) Repakkitúl (Torch Stub), a hammerhead shark, the head shaped like the stub end of a burnt-out coconut-leaf torch;
  - (j) Mehánipaw (In Front of Holes), a school of a kind of fish which frequent the openings of holes in the deep reef;
  - (k) Helen Reef\*.
3. Under Star 17 to:
  - (a) Fanuwairer (Land of Terns), an island inhabited by small black terns;

- (b) Fanuanurupwaw (Land of Rooster Tail Feathers), a sandy islet;
- (c) Fanuanpwong (Land of Night). It is of interest that T., in conversation unrelated to any of these systems of organisation, described the same three places just listed and located them again south of Helen Reef but in reverse order.

4. Under Star 9 to:

- (a) Fanuaitik (Land of tik-Vine), an island with this vine (same as XI H 5 k? That seems to be much further north);
- (b) Fanuainúyol (Land of Yellow Coconuts), an island;
- (c) Fanuainúcha (Land of Pink Coconuts), an island;
- (d) Namwin Pikenúúlap (Atoll of Large Coconuts), an atoll (see XI I 2 a);
- (e) Piairálúk (Branching Sandbank Outside), a sandy place outside of a group of islands.

5. Under Star 1 to:

- (a) Onomaan (Prone Creature), a black eel with yellow fin lying on the surface;
- (b) Riimwow (Head to South), a kuling plover flying south (probably the same as XI A 1 f);
- (c) Riimwelong (Head to North), a kuling plover flying north (probably the same as XI A 1 d);
- (d) Nápwilháwaw (Fishing Southwards), a sooty tern flying about hunting food (compare with XI A 1 e);
- (e) Nápwilhálong (Fishing Northwards), a sooty tern fishing for food (compare with XI A 1 c);
- (f) Naikehára (Hára Fish), a small reddish-coloured snapper (possibly the same as XI A 2 l and XI B 6);
- (g) Náfiihap (Moving About Village), a flock of birds of various species from Pulusuk fishing here and there; "village" refers to Pulusuk;
- (h) Pulusuk\*;
- (i) Éépúngak (Fish-hook Right Angle), a reef whose northern end is shaped like a fish-hook; the course from Pulusuk north intersects at right angles with it as it curves to the west. No doubt is part of Manila Reef.
- (j) Hawmwar (Chief of Gap), a manífer shark with white-tipped fins, living in a deep area between two reefs; no doubt part of Manila Reef.
- (k) Hawkariimw (Chief of Head), a booby hovering east of a head-shaped reef; another part of Manila Reef.
- (l) Hawkáráp (Chief of Nearness), a tagu fish accompanied by some smaller mamerik fish; "nearness" refers to Puluwat.
- (m) Puluwat\*.

F. The Breadfruit Picker of Gamma Corvi (by T.)

This Breadfruit Picker starts from Puluwat under Star 12 and is extended to some place near the Mortlock Islands, then turns north-west to Truk, then due west back to Puluwat, its path thus forming a closed triangle. Except for Truk, only sea-life, sandbars, and reefs are mentioned.

1. From Puluwat under Star 12 to:

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(a) Lénpwóreyánwiré (In Wiré's Curve), a curve in the south edge of Uranie Bank, Wiré being the name of a man who discovered this fishing area generations ago;

(b) Nayúkúnimwar (White Tailed Tropic Bird with Necklace, see XI B 3);

(c) Nemekireng (Lightly-applied Turmeric Powder), a light-yellow lihingér, a gull-like bird (see XI B 2); this and the preceding bird are in reverse order compared to the same two birds in XI B.

(d) Pianópule (Sandbar of Ópule, see XI A 2 h);

(e) Piamaramar (Garland Sandbar, see XI A 2 j);

2. Under Star 29 to:

(a) Wááyhéngar (Hole of Héngar, who is a spirit), a reef hole of this name, some place close to Lukunor;

(b) Wááynimwar (Hole of Chaplet). This is a bank, despite its name, which is the same as that applied to the reef-hole at Oroluk (in I. Reef-hole Probing), and it has no reference to Oroluk.

(c) Féwipwérepwér (White Stone), a place of that description on a bank;

(d) Truk\*.

3. Under Star 25 to:

(a) Nelingairúk (White Tropic Bird Sighting Truk), a bird of this species lacking the usual long tail feathers; Truk is in sight.

(b) Firimetá (Swimming East), a school of porpoises eastward bound;

(c) Firimetiwi (Swimming West), another school of porpoises, this one westward bound;

(d) Pééyрэ (Empty Leaf), a small shark with white-tipped fins that leaps to scraps thrown overboard; the reference to an empty leaf is to the wrappings of food parcels that are discarded;

(e) Eherewór (Fish-Scaring Bank), a swordfish with a white tail chasing the fish of this bank (see also IV);

(f) Puguelearúaan (Bank-Point in Arúaan), point of bank (part of Uranie Bank) stretching out from Puluwat into Arúaan, which is the name of the sea between Truk and Puluwat;

(g) Puluwat.

### G. The Breadfruit Picker Under Southern Cross Upright (by T.).

As with the last Picker, only one island, Pulusuk, is mentioned here, other than the starting and ending point, Puluwat. This course ranges far to the south and many sea-marks allegedly near New Guinea and eastwards, mentioned in previous pickers, occur again.

1. From Puluwat south under Star 17 to:

(a) to (l) All the places listed under XI E 5, except in reverse order;

(m) Mwarenima (Flotsam of Gap-Between-Banks, see XI A 1 n).

2. Under Star 4 to:

(a) Fanuairepung (Land of Ivory Nuts), an island, said to be near New Guinea;

(b) Fanuanmwár (Land of Chaplets; see XI A 2 e);

(c) Hawifór (Dark Trumpet Shell; see XI A 2 i);

- (d) Fanuanligáfenek (Land of Mid-Morning), an island;
- (e) Fanuanpeito (Land of Gray Pumice), an island;
- (f) Fanuanmúr (Land of Black Pumice), an island;
- (g) Fanuaichen (Land of Chen Plants), a sandbar covered with this plant; see XI A 2 s, where it is described as an island;
- (h) Fanuainat (Land of the Nat Beach Shrub; see XI A 2 r);
- (i) Fanuainóm (Land of Mosquitoes), an island;
- (j) Fanuaimánamán (Land of Fruit Flies), an island;
- (k) Peleeyta, an island (see also XI A 2 q, XI I 1 n, and XI H 3 b);
- (l) Mahang, an island (see also XI A 2 t and XI I 2 c).

3. Under Star 15 to:

- (a) Fanuanmótiw (Land of Red Spider Lily; see XI A 2 f);
- (b) Fanuankióp (Land of White Spider Lily; see XI A 2 g);
- (c) Piyanwowyól (Sandbar of Looking at the Sun; see XI A 1 m, where Y. translates yól, "yellow", as loveliness, but T. gives it as the sun here because this place is close to the eastern limit of the world, where the sun rises);
- (d) Piyanuriyól (Sandbar of Strolling near the Sun; see XI A 1 k and XI I 3 j);
- (e) Yángilúk (Wind Outside), a whirlwind.

4. Under Star 27 to:

- (a) Likósu, a whirlpool;
- (b) Liwórófmetau (Sea Swallow), a spirit of this name living in a whirlpool and swallowing everything that drifts its way;
- (c) Rahoyól (Yellow Puff of Flame), a yellowish shark that looks like a puff of flame when it rises in the water;
- (d) Yareng (His Turmeric), a light-yellow shark;
- (e) Yamwár (His Necklace), a whale with a white ring around its neck;
- (f) Manukmwár (White Tailed Tropic Bird Necklace), an individual of this species with a black ring around its neck;
- (g) Oranipitiw, a bank covered by limaheypáli flatfish;
- (h) Rámaile (Orange-coloured Aile Fish), a bank inhabited by a fish of this species, which is not normally orange;
- (i) Oranteiteiko, a bank covered by one enormous clam;
- (j) Ilukorál (Orál-tree Leaf), a large flock of hawal petrels;
- (k) Puluwat.

H. Breadfruit Picker under Altair (by T.)

This Picker is incomplete, the narration by T. having been interrupted by the sudden termination of field work. The course begins at Truk and heads east to the limits of the Puluwat world, then swings back across the northern margin of the Carolines as far as the setting of the sun, then turns back east again through the middle of the archipelago, the interruption coming at Elato.

1. Under Star 9 from Truk to:

- (a) Ponape\*;
- (b) Kusaie\*.

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### 2. Under Star 7 to:

(a) *Ikánurám* (Orange-coloured Fish); in spite of the name of this place, it is a pinkish-yellow or orange frigate bird which is seen flying about here;

(b) *Ikátíl* (Sewing Fish), a frigate bird with a *lirok* plover flying around it, its flight pattern resembling the motion of sewing (see XI I 1 l);

(c) *Álel* (Target), an island. T., H., and X. all place it in the far east, as far due east as one can go. Damm<sup>(23)</sup> identifies it as Jaluit in the Marshalls.

### 3. Under Star 25 to:

(a) *Pulomar*, an island supposed to be north or north-east of *Kusaie* (see XI I 1 o);

(b) *Peleeyta*, an island supposed to be north-east of *Ponape* (see XI A 2 q, XI G 2 k, and XI I 1 n);

(c) *Úúwéúw* (Pile of Floating Debris; see XI A 3 b and XI I 1 p). North of *Ponape*. These last three places are given in XI I 1 on an east-west line, as here too, but in different order.

(d) *Peinwólák* (Rubbish of Cuttings), west of *Ponape* (see XI A 3 a);

(e) *Matogiliang* (Many Liang-shells), a bank with piles of sea-shells of this species. Same as XI H 3 e, but there it is a reef between *Magur* and *Murilo*, while here it seems to be further east.

(f) *Naikemang* (Pandanus-leaf Fish), a small light-green (pandanus-leaf colour) lobster of a species with a very long tail; does not ordinarily live in the ocean but this individual does, on a floating object;

(g) *Suwaneyu*, a *fóófó* fish living in froth;

(h) *Magur\**;

(i) *Pworósá*, a whale with many *fóófó* fish about it;

(j) *Finmareirapuk* (Chaplet String), a large sea crab of *yálibáp* species, living on a floating object, marked on its shell with what looks like a chaplet; it has one normal claw and one paddle-shaped claw (perhaps same as *árik* crab in X);

(k) *Repwas* (They Dry), a whale (plural pronoun is honorific) which never dives but always suns its back;

(l) *Gaferut\**;

(m) *Ikamwén* (*Mwén* Fish), a red reef-dweller but here living in the sea.

(n) *Fais\**.

### 4. Under Star 26 to *Yap\**.

### 5. Under Star 25 again to:

(a) *Lumaráp* (Nearby Seaweed; see XI C 1 e and XI J 2);

(b) *Lumatoow* (Distant Seaweed; see XI C 1 f and XI J 1);

(c) *Ikomwólék* (School of *Lek* Fish; see XI A 3 l, XI D 6, XI I 3 k, and XI J 3);

(d) *Ikopwér* (White Fish), a *yár* fish which ordinarily lives among reefs (see XI A 3 m and XI J 4);

23. Damm 1935:103.

- (e) Ikórel (Black Fish), a reef fish of ikórel species (see XI A 3 n and XI J 5);
  - (f) Wenikierik (On the Small Mat), a bank bearing markings like the cross-hatching of a diagonally plaited mat, "small" referring to the diamond shapes of the plaiting;
  - (g) Wenikielap (On the Large Mat), another bank with larger diamonds;
  - (h) Meyang (Breadfruit Work; see XI A 3 o);
  - (i) Naihaniwa, a coral head (see II and XI A 3 r);
  - (j) Hawpwiruk (Half Peak), a mountain peak. Since this course is still running westwards from Yap the only place this could be is in the Philippines.
  - (k) Fanuaitik (Land of Tik-Vine), reached through a channel which runs past the mountain just mentioned (see XI E 4 a);
  - (l) Piyánurungani (Sandbar to Recreation), a sandbar with many birds on it;
  - (m) Fanuaitupw (Land of Setting), an island where the sun sets.
6. Under Star 12 to Pulo Anna\*.
7. Under Star 7 to Sorol\*.
8. Under Star 9 to:
- (a) Falalis\* (in Woleai atoll);
  - (b) Ifaluk\*;
  - (c) Orairúklong (Tilted Bank), a bank of that description. This is Oraruguron Reef, north of Elato.
  - (d) Mehailianú, the channel between Elato and Lamoliur (see II also). What appears to be the same name in the Ifaluk dialect, Misailealu, is given by Burrows<sup>(24)</sup> as a reef lying under Star 16 from Olimarao.
- I. A Breadfruit Picker, no name given, recorded by Gladwin from I.
1. From Puluwat under Star 9 to:
- (a) a ray;
  - (b) a booby;
  - (c) a whirlpool;
  - (d) a frigate bird;
  - (e) a white tern;
  - (f) Truk\*;
  - (g) a reef south of Minto Reef\*;
  - (h) Oroluk\*;
  - (i) Ponape\*;
  - (j) Kusaie\*;
  - (k) a shark;
  - (l) a frigate bird with another small bird flying about it (see XI H 2 b);
  - (m) a golden sea bass; three islands with the names respectively:
  - (n) Peleeyta (see XI A 3q, XI G 2 k, and XI H 3 b);
  - (o) Pulummar (see XI H 3 a), and
  - (p) Úúwow (see XI H 3 c and XI A 3 b);
  - (q) a turbulent band of water;
  - (r) a spirit called Wereyón (see V and XI A 2n). Thence:

24. Burrows 1957:341.

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### 2. Under Star 7 to:

- (a) an island Pikenúúlap (see XI E 4 d);
- (b) a spirit Efólumét;
- (c) an island Masang (see XI G 2 l and XI A 2 t);
- (d) a spirit Aamwór.

### 3. Under Star 25 to:

- (a) a spirit Aaróng;
- (b) an island Iikanuraun;
- (c) an island Ngóngó (see XI A 2 a);
- (d) the islet Sol on the northern side of Murilo\* atoll;
- (e) a big whale;
- (f) another big whale;
- (g) a frigate bird;
- (h) Gaferut\*;
- (i) a golden porgy;
- (j) a sandbar Piyenuriól (see XI A 1 k and XI G 3 d);
- (k) a small fish Iikomelik (see XI A 3 l, XI D 6, XI J 3, and XI H 5 c);
- (l) a large frigate bird;
- (m) the tip of New Guinea.

### 4. Under Star 4 to Palau.

### 5. Under Star 9 again to:

- (a) Yap\*;
- (b) Woleai\*;
- (c) Ifaluk\*;
- (d) a reef near Elato\*;
- (e) Satawal\*;
- (f) a booby;
- (g) a shark with many small fish around it;
- (h) a ray;
- (i) Condor Bank\*;
- (j) a frigate bird;
- (k) Puluwat\*.

J. A Breadfruit Picker, no name given, recorded by Gladwin from H. It starts at Taú selectá (see II, V, and XI A 3 p), which is called a sort of land's end on New Guinea, and runs east under Star 9 to:

(a) Lumutoow (see XI C 1 f and XI H 5 b), a place where there is seaweed, far from land;

(b) Lumarap (see XI C 1 e and XI H 5 a), a place with seaweed, nearer land, in this case the land is Yap;

(c) Iikomulek (see XI A 3 l, XI D 6, XI H 5 c, and XI 1 3 k), a place with lots of lek fish;

(d) Iikapwech (see XI A 3 m and XI H 5 d), a white trigger fish;

(e) Iikachón (see XI A 3 n and XI H 5 e), a single black trigger fish;

(f) Yap\*;

(g) Iikalek, another place with lots of lek;

(h) Fais\*;

(i) a mwi plover in a place called Mwi;

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- (j) Pawyón, a single yellowish shark;
- (k) Gaferut\*;
- (l) Sowfóchów, a single butterfly fish;
- (m) Magur\*;
- (n) Motukwiliang (see XI H 3 e), a reef between Magur and Murilo;
- (o) Sol, the islet on the north side of Murilo.

K. Another Breadfruit Picker by H. It starts at Palau and runs under Star 9 to:

- (a) Woleai\*;
- (b) Lamotrek\*;
- (c) Puluwat\*;
- (d) Truk\*;
- (e) Oroluk\*;

and ends at

- (f) Ponape\*.

L. Another Breadfruit Picker by H. It starts

1. From Eauripik under Star 6 to:

- (a) Ifaluk\*;
- (b) Olimarao\*;
- (c) Wochánipwópw (see XI E 2 e), a reef 20 or so miles west and north of Pikelot.

2. Under Star 12 to:

- (a) Pikelot\*;
- (b) Puluwat\*;
- (c) Namoluk\*;
- (d) Ngatik\*;
- (e) Fanúaaylúk, an island far to the east, perhaps in the Gilberts.

M. A final Breadfruit Picker by H., going westwards under Star 22 to:

- (a) Ono\*;
- (b) Ulul\*;
- (c) Pikelot\*;
- (d) Lamotrek\*;

and

- (e) Eauripik\*.

The seriousness with which Puluwat navigators regard the information contained in the systems that have been described is very apparent. Some of that information consists of valuable and closely guarded secrets, as Gladwin describes at length in his book.<sup>(25)</sup> Faith in its worth is not lessened by what seems to us a distressing lack of the precision and sharpness that we expect from a body of knowledge intended for practical use, indeed use in situations which may be vital. The frequent occurrence of literary devices in the exposition of the categories of knowledge, such as the use of a pairing—yellow heron followed by black heron, boatman in

25. Gladwin 1970.

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fern canoe and in sand canoe, whale with two heads and whale with two tails, etc.—gives an aspect to some systems, particularly in the sea life that is part of them, in which literary form seems to become as important as scientific accuracy. Also, it is evident from comparison of the knowledge of different navigators, even of those of the same school, that there is more than one truth; that in spite of the reverence accorded to the system there is innovation and experiment.

As Gladwin points out, the greatest discrepancies occur in those bodies of information that are least practical and hence least often subjected to empirical testing. In circumstances where testing rarely occurs there is obviously room for idiosyncrasy. The secrecy which is part of navigation also makes the likelihood of gradual innovation more likely than if information is widely shared and error corrected. T. emphatically denies that a system like *Looking At An Island*, which is severely practical, is ever altered, even to accommodate new information. But in other systems, where the fabulous enters, changes must occur; the existence in the various categories of place names like *Mariales* (Marianas, meaning Guam) and *Manina* (Manila, meaning the Philippines) obviously implies additions, or at least substitutions in name. I myself fathered one change. Y. was narrating to me the system called the Breadfruit Picker of the Chief of *Kafeoor* in which a long pole is conceived to be extended from that mythical place toward distant islands to hook useful objects and draw them back. In Y.'s recitation the picker had just been stretched toward a place where 12 boobies stand on a floating object and had gathered in the birds; the next place was Palau, but here we stopped work briefly and conversation digressed to the people of Yap and how they used to go to Palau to quarry their stone money. Surprisingly, Y. had never heard of this. Upon resuming work Y. immediately described the picker as bringing back stone money to *Kafeoor* from Palau. When I remonstrated he said that he would ordinarily have mentioned food, not money, but he was taken with the new idea and saw no reason why he should not substitute it for the old one.

But of course, Y.'s innovation was in a very incidental, non-utilitarian aspect of his knowledge. In more important matters there is less tampering. Y., T., H., and I. could all cite cases from personal experience of encounters with sea-life phenomena exactly where they were supposed to be. T., for example, insists that he has many times seen a particular shark with white-tipped fins at a certain reef between Puluwat and Pulusuk (the shark being one of the sea-marks in XI E 5 j), and perhaps there really is a recognisable and relatively long-lived shark that inhabits that spot. But Y. says with the same sort of faith that T. displays, that he once, in circumstances where it vitally mattered, came upon the floating coconut which is part of the chain of sea-life phenomena radiating out from Ulul under Star 29, and was enabled thereby to home in on Ulul. When I asked him whether this could not have been just any coconut his answer was that it was a freshly-fallen one, as was called for in the tradition, far out to sea though it was, hence it must have been the proper one. Another time I asked T. how a flock of plovers could always be seen flying north yet

remain in the same place; he answered simply that perhaps God (25 years ago he would have said the spirit of navigation) ensured that they would constantly return.

Perhaps an occasional sighting of an animal or bird in the expected place is enough to convince any potential skeptic of the reality and reliability of the phenomena. The persistence of belief in the ghost islands of Kaféfoor and Fanuankuwel is harder to explain. Some of the descriptive island-names in the south, east, and west (Land of Turmeric, Land of Gray Pumice, Land of White Lilies, etc.) may be based on faint memories of storm-driven voyages to distant places or on castaways from such places. Perhaps some of these names were once esoteric names of places that had common names as well—West Fayu, as an example, is commonly called Pigailo, but bears the additional appellation Faayráp—and in the course of time the two have become separated. The existence of an alleged Land of Rooster Tail Feathers in the same general position as Merir, an island renowned for its long rooster tail feathers and to which a breadfruit picker is extended in one narration to obtain them, does suggest that this has happened. But the two ghost islands, the one somewhere north of Yap, the other north of Namonuito, placed as they are in the imagination in isolation on the open sea, cannot have such an origin. It is possible that they derive from some such navigational concept as etak, which is the use of a reference island to one side of a course between two other islands, the reference island being considered to move from under one star to another as the voyage proceeds.<sup>(26)</sup> Only islands and reefs serve as reference points in etak, but, as they pass under successive stars in the navigator's imagination, the assumptions that he makes sometimes distort their true position so much that they might as well be purely imaginary. Perhaps completely imaginary points were once used, if not in etak then in some similar system, and in the case of the two ghost islands they have somehow become reified in the tradition.

The origins of the curious arrangements of data and courses which compose the various classifications we have described are equally obscure. The purpose, Puluwatans say, is to learn geographical relationships, but how is that facilitated, for example, by the concept of a dizzy zigzag on an apparently haphazardly chosen course from island to reef to sea-life and back to an island as in the Fortune Telling of the Sea Bass's Food? The inclusions and omissions in that system seem utterly capricious. Navigators do indeed engage in pedantic displays of knowledge, both to enhance their esteem and to bewilder the uninitiated, and it is conceivable that the Fortune Telling is only an instance of professional preciosity. Perhaps it is comparable with the intellectual gymnastics of Talmudic scholars, who delighted in posing each other problems like the question which asks what word on a certain page of holy writ a pin would touch if pierced through another word at a certain earlier page. It is possible to imagine a master navigator picking up a discarded coconut leaflet midrib which had been used for foretelling and requiring one of his students to follow its folds and turns as though it were a chart, naming

26. cf. Gladwin 1970:181-9.

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all the places thereby represented, and later this particular device becoming established as a part of the navigational curriculum.

Although many of the systems seem to have minimum practical value, the Puluwat navigators cling staunchly to them. It will be recalled that one of the systems, Aligning the Skids, makes use of the image of six whales in a row, lined up east and west with their heads to the north, like a row of canoe skids. Each whale is situated directly to the south of an island. The narrator sails in his imagination to the first whale, turns north to the island south of which it lies, turns back south again to the whale, then west to the second whale, north to the second island, back south again to the second whale and west to the third whale, etc., till he comes to the end. I asked T. why this tortuous path had to be followed when he could more simply give the names of the six islands from east to west and say that a whale lived to the south of each, describing each whale in turn. T. replied with some feeling that to do as I suggested would be to use an entirely different system, Pukoof (Sea Life), which is the listing of all the things to be encountered in sailing in a straight line under a particular star. To T. the categories of information which are organised by the various schematic images have importance in themselves, apart from the information they contain, and the distinctions must be maintained. T. also said that to describe the whales in the manner I had proposed would fail to bring out the metaphor involving the skids, as though that too had independent significance. Perhaps, in a way, my question was like asking a medical student why he employed an acronym to remember the names of a series of muscles, or even like asking a poet why he manipulated the language to achieve metre or rhyme when he could more practically say whatever he had to say in plain, straightforward prose.

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