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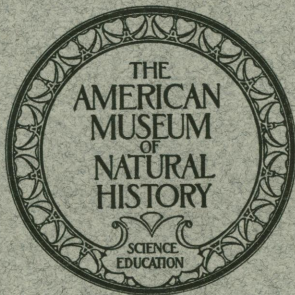
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VOLUME XXVIII, PART III

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WOODEN HOOKS USED FOR CATCHING SHARKS  
AND *RUVE* IN THE SOUTH SEAS;  
A STUDY OF THEIR VARIATION  
AND DISTRIBUTION

By E. W. GUDGER



BY ORDER OF THE TRUSTEES  
OF  
THE AMERICAN MUSEUM OF NATURAL HISTORY  
NEW YORK CITY

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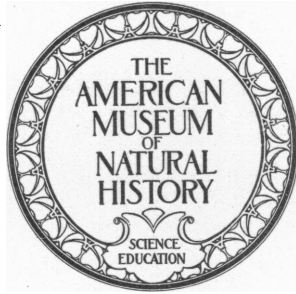
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## CONTENTS

	PAGE
INTRODUCTION . . . . .	206
SOURCES OF MATERIAL AND DATA . . . . .	209
THE IMPORTANCE OF FISHING IN THE SOUTH SEAS . . . . .	211
THE "PALU" OR <i>RUVERTTUS</i> HOOK OF FUNAFUTI ATOLL . . . . .	214
SHARK HOOKS. . . . .	217
DOUBTFUL FORMS. . . . .	217
New Guinea (Papua) . . . . .	217
Trobriand . . . . .	220
Maraki (Gilbert Group) . . . . .	221
UNDOUBTED SHARK HOOKS . . . . .	223
Tahiti . . . . .	223
Rarotonga (Hervey Group) . . . . .	224
Mangaia . . . . .	225
Fiji . . . . .	226
Nukufetau (Ellice Group) . . . . .	226
Hawaii . . . . .	227
Penrhyn or Tongareva . . . . .	229
New Zealand . . . . .	233
HOW THESE CURVED HOOKS ARE OBTAINED . . . . .	237
INTERMEDIATE HOOKS . . . . .	238
Hawaii . . . . .	238
Gilbert Group . . . . .	239
Ellice Islands . . . . .	242
Rotuma . . . . .	243
Tahiti . . . . .	243
Paumotus . . . . .	247
TRUE <i>RUVERTTUS</i> HOOKS . . . . .	249
<i>RUVERTTUS</i> HOOKS FROM POLYNESIA . . . . .	249
Ellice Group . . . . .	249
Tokelau or Union Group . . . . .	255
Tonga . . . . .	263
Cook or Hervey Group . . . . .	268
Austral Group . . . . .	269
Paumotus . . . . .	269
The J. L. Young Collection in the Bishop Museum, Honolulu . . . . .	270
High Islands (Society and Samoan Islands) . . . . .	272
New Zealand . . . . .	277
Hooks with Floats from Niue . . . . .	278
Alleged Ellice Islands Hook with Float . . . . .	283
ABNORMAL POLYNESIAN-MICRONESIAN <i>RUVERTTUS</i> HOOKS . . . . .	285
V-SHAPED TYPE . . . . .	285
Tahiti . . . . .	285
Gilbert Group . . . . .	285
U-SHAPED TYPE . . . . .	286
Bowditch Island, Tokelau or Union Group . . . . .	286
Kingsmill or Gilbert Group . . . . .	293
<i>RUVERTTUS</i> HOOKS FROM MICRONESIA . . . . .	294
Gilberts (Kingsmill Group) . . . . .	294

	PAGE
Marshall Islands . . . . .	297
Nauru . . . . .	298
Mortlock Islands (Caroline Group) . . . . .	300
<b>RUVETTUS HOOKS FROM MELANESIA</b> . . . . .	307
The Southern Mortlocks, Marcken, or Marqueen Islands . . . . .	307
Nissan (Sir Charles Hardy Group) . . . . .	309
Nuguria Atoll (Abgarris or Faed Islands) . . . . .	310
Buka . . . . .	311
Tasman and Ontong Java (Lord Howe Islands) . . . . .	311
Sikaiana or Stewart Island. . . . .	325
Unknown Melanesian Sources . . . . .	327
Eccentric <i>Ruvettus</i> Hook from Southeast Island in the Louisiades . . . . .	328
Size of Melanesian <i>Ruvettus</i> Hooks and <i>Ruvettus</i> Fish . . . . .	330
<b>HOW RUVETTUS IS CAUGHT ON ITS PECULIAR WOODEN HOOK</b> . . . . .	331
<b>USE OF STEEL HOOKS FOR TAKING RUVETTUS</b> . . . . .	336
<b>DISTRIBUTION OF THE RUVETTUS HOOK</b> . . . . .	337
<b>THE HALIBUT HOOK OF ALASKA.</b> . . . .	342
<b>BIBLIOGRAPHY</b> . . . . .	345

LIST OF ILLUSTRATIONS  
TEXT FIGURES

	PAGE.
1. <i>Ruvettus pretiosus</i> , the Oilfish—a Mounted Skin in the American Museum	212
2. A 9.25-inch Wooden Palu Hook from Funafuti, Ellice Islands . . . . .	214
3. A Fork of <i>Vala Vala</i> Wood from Nukulaelae, Ellice Islands, from which a Palu Hook would have been made . . . . .	214
4. A Roughly Finished Palu Hook from Funafuti . . . . .	214
5. A 19-inch Shark (?) Hook from Milne Bay, New Guinea . . . . .	218
6. A 22-inch Wooden Hook from Milne Bay, New Guinea . . . . .	218
7. An 18-inch Wooden Shark Hook from Trobriand Island . . . . .	220
8. A 10-inch Hook from Maraki, Gilbert Group . . . . .	222
9. A Hook (9.25 inches long) from Maraki, Gilbert Group . . . . .	222
10. Wooden Shark Hook (11 inches) from Tahiti, with Cord of Attachment and Sinker of Stalactite . . . . .	224
11. Shark Hook from Rarotonga with Broken-Off Barb . . . . .	224
12. A Barbless Wooden Shark Hook (10.25 inches) from Fiji . . . . .	225
13. A Highly Ornamented Wooden Shark Hook (11.5 inches long) from Man- gaia, Hervey, or Cook Islands . . . . .	225
14. A 12-inch Barbless Wooden Shark Hook from Nukufetau, Ellice Islands	225
15. A Round-Bottomed Wooden Hook (10.7 inches) from Hawaii . . . . .	227
16. Hawaiian Shark Hook, 10 inches long, cut out of a Single Piece of Whale's Bone . . . . .	227
17. Wooden Shark Hook, 14.5 inches long, in the British Museum Collection from Hawaii . . . . .	228
18. A Large Wooden Shark Hook from Penrhyn (Tongareva) Island . . . . .	229
19. A 15-inch Wooden Shark Hook from Penrhyn Island . . . . .	230
20. Shark Hook with Horn Barb from New Zealand . . . . .	232
21. Wooden Shark Hook with Horn Barb from New Zealand . . . . .	232
22. A Wooden Fish Hook, 8.5 inches long, from New Zealand . . . . .	234
23. A 17-inch Wooden Hook of Intermediate Design from Hawaii . . . . .	238
24. A 9.75-inch <i>Ruvettus</i> -Shark Hook of Unusual Form from Maraki Island, Gilbert Group . . . . .	239
25. An Intermediate Hook (6 inches long) from Maraki Atoll . . . . .	239
26. A Hook from the Gilbert Islands now in the Bishop Museum, Honolulu . .	242
27. A Huge (15.25 inch) Wooden Intermediate Hook from Tahiti . . . . .	244
28. A Colossal Hook of the <i>Ruvettus</i> -Shark Type from the Society Islands . .	244
29. Large Wooden <i>Ruvettus</i> ("Shark") Hook from Tahiti . . . . .	246
30. An 8.8-inch Wooden Hook from Fagatau, Paumotu Group, used for taking both Sharks and <i>Paru</i> . . . . .	247
31. Hook from Funafuti, Ellice Islands . . . . .	250
32. A Palu Hook (4 inches long) from Nukulaelae, Ellice Islands . . . . .	252
33. Palu Hook from Nanumea, Ellice Group . . . . .	252
34. An Ellice Islands (?) Hook 10.9 inches long . . . . .	253
35. A Palu Hook obtained in Samoa, but said to have come from the Ellice Islands . . . . .	253
36. Wooden <i>Ruvettus</i> Hook from Fakoa (Bowditch Island), Union Group . .	255

	PAGE
37. A Large (11.75 inch) <i>Ruwettus</i> Hook from Bowditch Island, Union Group . . . . .	256
38. Barb of Bowditch Island Hook showing Hooked Point and Slender Base . . . . .	257
39. Palu Hook from the Union Group, now in the British Museum Collection . . . . .	258
40. A 13-inch Hook presumably from Fakaofu, or Bowditch Island . . . . .	259
41. A 12-inch Wooden Hook of Unknown Origin, but doubtfully assigned to the Ellice Islands . . . . .	259
42. A <i>Ruwettus</i> Hook from Tokelau (?), made from a Narrow Fork and provided with a Tortoise Shell Barb. . . . .	262
43. A <i>Ruwettus</i> Hook from Tonga . . . . .	265
44. A Defective <i>Ruwettus</i> Hook from Tonga . . . . .	265
45. <i>Ruwettus</i> Hook Number 5 in the American Museum Collection from Tonga . . . . .	265
46. An Alleged Bowditch Island Hook . . . . .	267
47. A Finely Finished Palu Hook from the Cook or Hervey Group . . . . .	267
48. A Wooden Hook (10.75 inches long) used for taking <i>Uravena</i> in the Austral Isles . . . . .	269
49. An 8.4 Inch <i>Ruwettus</i> Hook from Kakahina in the Paumotu Archipelago. . . . .	269
50. The Smallest <i>Ruwettus</i> Hook (2.5 inches long) on Record . . . . .	271
51. The Second Smallest <i>Ruwettus</i> Hook Known . . . . .	271
52. A 5.25-inch Shell-Tipped Hook. Locality Unknown . . . . .	271
53. A Pearl Shell <i>Ruwettus</i> Hook from Tahiti . . . . .	273
54. Three Pearl Shell Hooks and a Wooden Hook with Pearl Shell Barb from Tahiti . . . . .	274
55. A <i>Ruwettus</i> Hook (5.25 inches long) from the Society Islands . . . . .	275
56. A Wooden Hook used for taking Large Fishes in the Samoan Islands . . . . .	276
57. Wooden Palu Hook from New Zealand with a Bone Barb and a strengthening Lashing at the Base . . . . .	279
58. A <i>Ruwettus</i> Hook (4.5 inches long) and Float (8 inches long) from Niüe (Savage Island). After Edge-Partington, vol. I, pl. 67, fig. 6 . . . . .	279
59. A Wooden <i>Ruwettus</i> Hook with Wooden Float and Stone Sinker figured with Objects from Niüe but "labelled New Guinea." After Edge-Partington, vol. II, pl. 39, fig. 4 . . . . .	279
60. A "Gang" of Palu Hooks from Niüe, composed of Hooks, Floats, Sinker and Bundle of Line. Slightly modified from the original drawing by Etheridge, 1899 . . . . .	281
61. A "Gang" of Six Small <i>Ruwettus</i> Hooks, with Floats and Sinker, from Niüe. The sinker is at the bottom and the fisherman's line is attached at the top. Sketched from a photograph by courtesy of Bishop Museum . . . . .	282
62. A Wooden <i>Ruwettus</i> Hook from Tahiti with an Upward Pointing Bone Barb. In Commercial Museum, Philadelphia . . . . .	285
63. A Wooden Hook (14.4 inches long) from the Gilbert Islands (?). The second figure shows how the bone barb is affixed. Courtesy of Bishop Museum, Honolulu . . . . .	286
64. An Eccentric <i>Ruwettus</i> Hook said to be from the Kingsmill or Gilbert Group but herein assigned to Bowditch Island, Tokelau Group . . . . .	287
65. A Markedly Eccentric <i>Ruwettus</i> Hook said to have come from Tahiti but herein definitely assigned to Bowditch Island, Tokelau Group. Both hooks in collections of the United States National Museum . . . . .	287

## PAGE

66.	An Asymmetrical <i>Ruwettus</i> Hook alleged to come from Tonga, but Herein assigned to Bowditch Island; Barb of Preceding Hook; Barbs from the reputed Kingsmill and Tahiti Eccentric <i>Ruwettus</i> Hooks in the United States National Museum	291
67.	A 10.5-inch Unfinished Wooden Hook from Tamana Island, Gilbert Group	295
68.	A 14-inch <i>Ruwettus</i> Hook from Tarowa Island, Gilbert Group	295
69.	An Unusual Form of <i>Ruwettus</i> Hook from the Gilbert Islands	295
70.	An 11-inch <i>Ruwettus</i> Hook from Ebon, Marshall Islands	297
71.	Wooden <i>Ruwettus</i> Hook with Sinker from Nauru, Nawodo, or Pleasant Island	298
72.	A 12-inch <i>Ruwettus</i> Hook with Float from the Northern Mortlock Islands (Caroline Group)	302
73.	The Largest <i>Ruwettus</i> Hook on Record, 17.75 inches long.	302
74.	A 14.5-inch Oilfish Hook from the Northern Mortlocks	302
75.	A Small Solid Bone Hook (3.5 inches long) from the Caroline Mortlocks cut from a Flat Bone.	305
76.	A 4.5-inch Wooden Hook with Coconut Shell Barb, from the Northern Mortlock Islands	305
77.	The Largest (5 inches) of the Six Diminutive Palu Hooks from the Carolina Mortlocks	305
78.	A 12.5-inch <i>Ruwettus</i> Hook, from the Southern Mortlock (Marcken) Islands, with Long Pointed Barb and Float with Attached Cord	308
79.	A 12-inch Wooden <i>Ruwettus</i> Hook and Float from the Marcken (Southern Mortlock) Islands	309
80.	A 14.4-inch <i>Ruwettus</i> Hook and 23-inch Float from Nissan Island lying just Northwest of Bougainville	310
81.	A Wooden <i>Ruwettus</i> Hook with Blunt Barb and Float from Ontong Java	312
82.	Hook, Float, and Sinker used for catching <i>Ruwettus</i> at Nukumanu (Tasman Island), Solomon Group	312
83a.	The Top of the Barb Leg of a Hook from Tasman Island	320
83b.	Tip of a Typical Shank Leg of Ontong Java and Tasman Hooks showing Knob below which Line is secured	320
84.	A Strong Wooden Hook (13.25 inches over all) from Ontong Java	323
85.	A <i>Ruwettus</i> Hook (15 inches long) from Tasman Island	323
86.	A Huge Parallel-Limbed <i>Ruwettus</i> Hook from Ontong Java	323
87.	A <i>Ruwettus</i> Hook from Sikaiana (Stewart Island)	325
88.	A Remarkable <i>Ruwettus</i> Hook from Ontong Java	326
89.	A 10.75 inch <i>Ruwettus</i> Hook said to have come from the Ellice Islands, but undoubtedly of Melanesian Origin	326
90.	A <i>Ruwettus</i> [?] Hook from Southeast Island in the Louisiades	329
91.	Two Round-Bottomed Halibut Hooks from the Kwakiutl	342
92.	Halibut Hook, Float, Sinker, and Line from Alaska	343

## INTRODUCTION

The author of this publication is a well known ichthyologist and editor of the final volume of the Bibliography of Fishes recently issued by this Museum. It was, in fact, while reviewing bibliographic material on the fishes of the Pacific, that Doctor Gudger became interested in *Ruwettus pretiosus*, the "Palu" of the Ellice islanders, or the so-called "purgative fish." Following up his interest in the distribution of this fish and its habits, he entered upon a study of the aboriginal methods of *Ruwettus* fishing and so to the peculiar and highly specialized hook used in taking this large, deep-sea fish. The accompanying paper follows a discussion<sup>1</sup> of the medicinal uses to which *Ruwettus* oil is put and another is in preparation describing the technique of modern *Ruwettus* fishing. Doctor Gudger's interest in the *Ruwettus* hook led to an examination of the collections in the Museum and in the course of subsequent discussions with the writer, he was encouraged to make an exhaustive study of this implement as a contribution to the material culture of the Pacific Area. His point of view in this investigation was that of a specialist in fishes and fishing, specifically concerned with the identification of the *Ruwettus* hook, its method and its distribution. In all this the accompanying pages speak for themselves. Doctor Gudger has handled his task well and deserves the lasting appreciation of all interested in Pacific anthropology, and it is from this point of view that the writer has accepted Doctor Gudger's invitation to introduce his work.

The author was not unmindful of the large place fishing holds in the cultures of the Pacific and the consequent great variety of fishing appliances, but selected the hook herein described as the most outstanding example of specialization in the fishing complex. However, in this study it was necessary to consider shark hooks for reasons stated in the text, finding objectively that all such hooks could be comprehended under two main classes, with three types of variants; viz., shark hooks, doubtful shark hooks, intermediate forms, true *Ruwettus* hooks, and lastly, abnormal variants. The relative distributions for these are given in the text (pp. 339-341), a perusal of which reveals ample grounds for justifying the author's classification, since we see that the hundred or more *Ruwettus* hooks are accompanied by a small number of variants; further, these variants are scattered over the whole range of the *Ruwettus* hook, as might be expected of mere deviations from the type.

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<sup>1</sup>Gudger, 1925.

The group identified as shark hooks is chiefly Polynesian, but note should be taken of the table in showing that the questionable shark hooks are from Melanesia and Micronesia, which, if true shark hooks, would indicate a distribution as wide as that for *Ruwettus*. Yet, it will be seen that in Polynesia the distinction between the two types of hook tends to be clear cut.

The main point, therefore, is that there is one type of *Ruwettus* hook widely distributed in the Pacific, the local variations consisting of inessentials. So *Ruwettus* fishing, as a culture trait-complex, is common to all of the three main culture areas (insular) in the Pacific. The ethnographical significance of this is that the technique of *Ruwettus* fishing has been distributed over the whole insular area in the Pacific and, since the distribution is continuous, presumably from a single center. Such examples of wide diffusion for a highly specialized trait are far from numerous, which enhances the importance of this contribution.

The method by which the fish is caught with this hook seems to be confined to the Pacific Ocean, but this is not the only type of hook so operating. The simple conventional type of fish hook tends to pull straight with the line, just as would a barb on a rod, because the fish gulps the hook entire. Such is not the case with the *Ruwettus* hook, since the fish takes into his mouth only the shorter or baited leg of the V-shaped hook, and when the line pulls on the end of the other shank, it tends to turn the barbed end over, or to reverse it, in the mouth of the fish. It so happens that scattered over the Pacific are small shell hooks resembling an open ring, which in a similar manner seize the gills of the fish and hold him firmly, but without injury. A metal hook of this description is now used in Japan, the fish so taken being kept alive in tanks or in fish ponds until wanted. So the suggestion in Doctor Gudger's paper is that a distinct technique concept underlies two or more types of hook and that the very highly specialized hook he has described is part of a specific hook complex quite distinct from that of the conventional hook.

However this may be, ring-like shell hooks, in every way similar to those from the Pacific, are found in archaeological collections from the coast of California. Further the similarities of certain wooden hooks from Alaska, and the adjacent coasts of Canada and the State of Washington, noted by the author, are based upon the same concept, and, so far as we know, it is only in and around the Pacific that this technique occurs. We have, therefore, what appears as a single diffusion area in which there is a basic trait-concept with a simple type of appliance and a more complicated variant, all suggesting a common center of dispersal.

It is in this setting that we see the importance of Doctor Gudger's contribution, emphasizing the value of intensive studies involving not only the mere trait as objectively observed but giving due consideration to the factors in the environment to which the trait under consideration is adjusted.

CLARK WISSLER.

## SOURCES OF MATERIAL AND DATA

As my studies, referred to above by Doctor Wissler, progressed, they took me farther and farther afield in the search for material. As will be seen, all known sources in America, and many others outside, have been drawn on. Undescribed *Ruvettus* hooks have come to me from sources now to be enumerated.

First of all, I found in the ethnological collections of the American Museum five *Ruvettus* hooks from Tonga. Next, Curator L. W. Jenkins sent me from the Peabody Museum, Salem, Massachusetts, seven fine hooks collected by Salem sea captains during more than one hundred years past in their roving through the South Seas. Then the Commercial Museum of Philadelphia, through the courtesy of Director P. W. Wilson and Curator Toothaker, loaned a fine specimen from Tahiti. A letter to Director C. C. Willoughby brought from the Peabody Museum of Harvard University beautiful full-sized drawings by the Museum artist, Miss Gleason, of four hooks collected in 1910 at Maráki Island, Gilbert Group, by the late Alexander Agassiz.

Next, Doctor Walter Hough and Mr. W. de C. Ravenel of the United States National Museum in Washington loaned thirteen very remarkable and interesting hooks, three of which were collected by Commander Wilkes on his famous expedition of 1838-1842 to the South Seas. To these the authorities of the Field Museum of Natural History, Chicago, most kindly added six specimens, and photographs of eight mounted hooks (with full data) from the priceless Parkinson collection from Melanesia now in that Institution. Next, my friend, Doctor Stanley C. Ball of the Bernice P. Bishop Museum, Honolulu, Hawaii, sent in photographs, sketches, and descriptions of twenty-five hooks which are among the Polynesian treasures of that Museum.

There are in the Australian Museum, Sydney, a number of hitherto undescribed *Ruvettus* hooks from the western Pacific. These vary from quite small hooks to gigantic sizes and are of great interest. Photographs and measurements of these have been courteously sent in by the authorities of this museum. And lastly, Mr. W. O. Oldman of London, a collector of ethnographical specimens, forwarded descriptions and sketches of all the *Ruvettus* hooks in his possession.

For all these multiplied courtesies I herewith make my best acknowledgments and return my heartiest thanks.

To Mr. S. Ichikawa, I am indebted for his efficient cooperation in making the large number of drawing and photographs which illustrate this article.

In addition to all these collections of hitherto undescribed material with which I have had the pleasure of working, the literature has been thoroughly searched and all known and many hitherto unknown descriptions and figures have been brought to light and incorporated herein. In this connection attention should be called to the invaluable aid afforded by Edge-Partington's great *Album of the Weapons, Tools, Ornaments and Articles of Dress of the Natives of the Pacific Islands*, to which constant reference will be made throughout this publication.

The present writer is an ichthyologist and not an ethnologist and he trespasses upon the field of the latter with considerable diffidence. However, having at hand what is believed to be all the known and available material and data and also an unsurpassed collection of illustrations of shark and *Ruvettus* hooks, the peculiar wooden hook used for taking the "purgative fish" *Ruvettus pretiosus*, in the central Pacific Ocean, it is hoped to make clear the differences and especially the many interesting variations in their structure and use, and to establish the distribution of this most specialized of fish hooks in the central Pacific Ocean.

## THE IMPORTANCE OF FISHING IN THE SOUTH SEAS

There are in the South Seas but two dependable sources of animal food, pigs and fishes—the one more or less cared for by feeding and found chiefly in the larger high islands, the other procured from the open waters. On the thousands of low-lying atolls which barely grow coconuts sufficient for food for man and for trade, fishes constitute almost the only flesh food. Here fishing becomes literally a fine art, for upon its success not infrequently depend the alternatives of plenty or a close approach to starvation. Hence, in the long course of time, the native inhabitants have evolved a number of highly specialized forms of hooks for catching these fishes.<sup>1</sup>

Of the fishes much esteemed for food, the sharks (almost universally condemned by us) stand high. Shark fishing is, then, an important part of the activities of the shore-dwelling population throughout the whole length and breadth of Polynesia. Furthermore, sharks play a large part in Polynesian folklore, mythology, and religious beliefs. In short they enter more largely into the lives of the native population than is ordinarily apprehended.

However, at certain islands and groups of islands there is found another large fish, called in the Ellice Islands the *Palu*, and by Europeans throughout Polynesia generally the “purgative fish,” but scientifically known as *Ruvettus pretiosus*. This is a bony fish sometimes attaining a length of 6 feet and a weight of 150 pounds, and much sought after by the natives for its excellent flesh and for the medicinal (purgative) value of its oil. For the catching of this fish there has been evolved one of the three most peculiarly formed and highly specialized hooks known.

In Fig. 1 is shown a mounted skin of this fish in the American Museum, from a specimen taken at Bermuda late in December, 1924. It was 4 feet long and weighed 24.5 pounds.

A word may be added here as to the kinds of hooks used for taking these various food fishes. Before the advent of Europeans the Polynesians used exclusively hooks of wood, of bone, of tortoise shell, and of pearl shell. Traders have, of course, introduced steel hooks, but these have, by no means, supplanted all the older kinds, especially those which

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<sup>1</sup>For a type study of the fishing complex in Polynesian cultures the reader is referred to two recent publications on the Marquesas Islanders (Handy, 1923, 164–180; Linton, 1923, 397–402). These publications make it clear that there are complex techniques for the taking of fish by spears, hook and line, snares, traps, poison, and nets, while the supplementary equipments consist of bows for fish darts, sling stones, special canoe appliances, and the use of fish ponds for preserving fish. Doctor Linton designates six main classes of fish hooks, varying from large to small and according to form and materials. It is evident, therefore, that fishing occupies a very large place in the aboriginal life of Polynesia and that the special form of hook discussed in this paper is one of the highly specialized types making up an extensive culture complex.

by hundreds of years of usage have become highly adapted for taking certain fishes like the bonito, the flying fish, the gar, *Ruwettus*, and the sharks. For bottom bait fishing for large fishes, like the two kinds last noted, large wooden hooks made from bent roots or from forked branches are used.

Both *Ruwettus* and sharks are still caught on wooden hooks of native manufacture. Although these hooks are in my judgment quite separate structures, still it is quite certain that they are often used interchangeably, and even more sure is it that they have been and are still confused by writers on the ethnology of the South Seas since both kinds are indiscriminately called "shark" hooks. The large forms of both hooks,

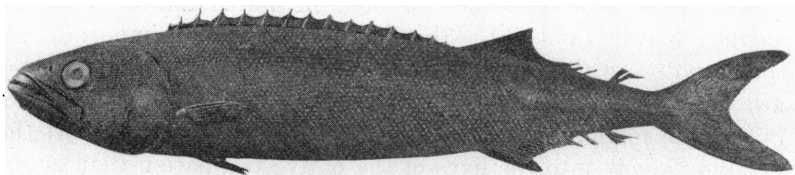


Fig. 1. *Ruwettus pretiosus*, the Oilfish—A Mounted Skin in the American Museum. From a four foot specimen weighing 24.5 pounds, taken at Bermuda, December 19, 1924.

particularly that of the peculiar *Ruwettus* type, are certainly used for taking both the "*Purgierfische*" and sharks; the largest are probably used for sharks alone, while the smaller sizes are presumably used each for its own kind of fish. In this paper I hope to make clear the likenesses and the differences found in these hooks. The common use of the shark and Palu hooks of large size for taking either kind of fish is in part determined by the fact that a 6-foot *Ruwettus* (apparently about the maximum size for this fish) and a 6-foot shark will have mouths of approximately the same size, the larger mouth possibly belonging to *Ruwettus*.

In general form the shark hooks of the South Seas do not, for the most part, depart much from the form of the ordinary conventional fish hook. They are simply large, strong round-bottomed wooden hooks with wooden or bone barbs suitable for catching and holding heavy sharks. They are wholly unspecialized. On the other hand, the *Ruwettus* hook is one of the three most specialized fish hooks known to me, the other two being the "feather hook" used for trolling for bonito in the Pacific Islands, and the halibut hook of the Alaskan and neighboring waters.

Of the *Ruwettus* hook Hedley<sup>1</sup> advisedly says:—

<sup>1</sup>Hedley, 1897a, 272.

As characteristic an ethnological feature of its especial region, as the boomerang of Australia or the bolas of South America, is the wooden deep sea [*Ruvettus*] fish-hook from the Central Pacific.

It is commonly called a "shark" hook, and it is, in all likelihood, used at times for taking such fish, but its primary function is for taking *Ruvettus*. These facts being accepted, before we can differentiate the two hooks, it will be necessary carefully to describe this very specialized hook.

## THE "PALU" OR *RUVERTTUS* HOOK OF FUNAFUTI ATOLL

The earliest and certainly the best known description of the *Ruvettus* hook is from the pen of the late Mr. Charles Hedley of the Australian Museum, Sydney. In 1896 the Royal Society of London sent to Funafuti Atoll in the Ellice Islands, an expedition to bore into the reef rock of the island in order to prove or confute Darwin's subsidence theory of the formation of coral atolls. The Australian Museum was asked to send a representative and Mr. Hedley was chosen. While at Funafuti he made

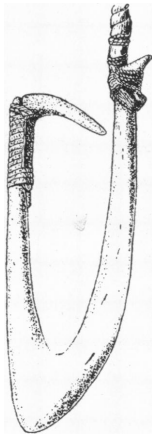


Fig. 2

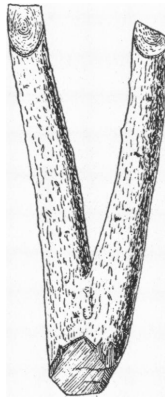


Fig. 3



Fig. 4

Fig. 2. A 9.25-inch Wooden Palu Hook from Funafuti, Ellice Islands. After Hedley, 1897a.

Fig. 3. A Fork of *Vala Vala* Wood from Nukulaekae, Ellice Islands, from which a Palu Hook would have been made, After Hedley, 1897 a.

Fig. 4. A Roughly Finished Palu Hook from Funafuti. Natural size about 8 inches. After Mrs. David, 1899.

extensive notes and collections of ethnological objects and on his return wrote a very interesting and valuable article on the ethnology of Funafuti, the most suggestive part of which is the section on the wooden Palu hook.<sup>1</sup>

Hedley figures and describes not only the completed hook, but also the fork from which it is carved and his illustrations are reproduced as Figs. 2 and 3. The hook has roughly the form of a V or U, varying according to the shape of the fork from which it is made. In this hook

<sup>1</sup>Hedley, 1897a, 272-276.

one leg is longer than the other and may be designated as the shank leg, while the shorter will be called the barb leg. The top of the shank leg is carved into two knobs, one pointing obliquely up and one down, with a saddle-shaped depression between, on the back side of the leg. The line of the fisherman, or, in many cases a snood or "line of attachment," is looped under the lower knob and fastened to the front of the top of the shank leg by a lashing passing around it and the shank in the region of the saddle, giving a very secure hold.

The shorter leg has lashed to its outer end a curiously shaped and set barb pointing inwards and downwards towards the shank leg. This is carved out of an L-shaped or right-angled branch or fork of a tree or bush, and has the outer side of one prong flattened to fit the similarly flattened inner surface of the barb leg, the two being bound or lashed together by flat bands of sennit. Funafuti hooks seem to have the barb lashed on the inner side of the barb leg; hooks from other localities have the barb placed differently on the end of the barb leg as will be shown in the course of this paper.<sup>1</sup>

This Funafuti specimen weighed 3.25 ounces and was 9.25 inches long on the long leg, 7.75 inches on the short, the greatest width between the limbs was 1.75 inches, and the length of the barb was 2 inches. This brings out another matter, namely that the barb, which is shaped very like a fowl's spur, does not point *directly* toward the shank leg, but slightly to one side, thus allowing the Palu some chance to get the hook with its bait easily into its mouth. Some other Palu hooks, however, as will be pointed out later, have the barb lying in the same plane as the legs of the hook, i.e., laid on a board all parts of the hook touch it. The particular hook under consideration is flattened laterally at the bottom of the V, but has the limbs rounded. Hedley's other Funafuti hooks were not finished so carefully. The native name of these hooks is *kou boru*.

Fig. 3 shows a fork of *vala vala* wood (*Premna taitensis*) from Nukulaelae Island, Ellice Group, an atoll lying about forty miles south-east of Funafuti. Consideration of this fork and of the possible variations of others of like kind will enable us to anticipate the shapes varying within certain limits in which we will find *Ruwettus* hooks figured and described in the course of this article.

This hook and fork are in the collections of the Australian Museum, Sydney. Edge-Partington has copied Hedley's figures in volume III of

<sup>1</sup>To orient ourselves and the hook in describing it, the reader will please understand that the hook is held as shown in the figure with the shank and barb legs up and the fork down, the shank leg next his eye and the barb leg away from him, the barb pointing to him. Furthermore, all measures are in straight lines "over all," unless noted to the contrary.

his *Album* (1898), plate 50, figs. 10 and 10x, and has also figured other ethnological specimens from the Ellice Group obtained by Hedley on the Funafuti Expedition, and now in the above-named museum.

While the data and figures given from Hedley are amply sufficient to introduce the reader to this curious wooden hook, it seems not inappropriate to include here another Funafuti hook collected on the same expedition as Hedley's. Thus the matter of its peculiar form and the set of the barb will be all the clearer in the reader's mind when comparison with shark hooks is made in the next section.

Mrs. T. W. Edgeworth David, who accompanied her husband on this expedition, has written a very interesting account of it,<sup>1</sup> and incidentally, figures a Funafuti hook and briefly describes it as follows:—

*Palu* hooks are cut solidly out of a very hard wood, are eight inches long, and nearly four inches wide in the widest part, and are difficult to shape and lash on a line.

Her figure is reproduced herewith (Fig. 4). On the long leg, note the 'nub' of a cut-off branch, as well as the form of the very end of the branch itself on which to anchor the looped end of the snood before lashing. The shape of the barb is somewhat different from Hedley's in that it is more curved and sharper pointed,—more like a fowl's spur—the extreme point of the barb being turned inwards and downward. To which surface (inner or outer) of the short leg the barb is lashed cannot be made out in the figure; presumably it is the inner.

Before going further, it may be well to state that the bait, generally a flying fish, is split open and laid scale side inward on either side of the barb and the top of the barb leg and lashed fast. The theory of the hook then is that the *Palu* bolts the barb leg of the hook with its attached bait and is caught behind the jaw or in the gills by the barb and held fast. The bones of the jaw being soft and easily torn, it is necessary for the hook to get a deep and firm hold to prevent its tearing out.

This description of Funafuti hooks is merely to present the make-up of a *Ruvettus* hook in comparison with shark hooks and certain forms which I have designated as intermediate. Both kinds of hooks will be studied in detail before we return to *Ruvettus* hooks proper, at which time a full discussion of those from the Ellice Islands will be entered into.

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<sup>1</sup>David, 1899, 248-250.

## SHARK HOOKS

Having made clear the structure and function of the *Ruwettus* hook we may now proceed to discuss various forms of the shark hook; to differentiate it from the *Ruwettus* hook, and to show how the typical shark hook goes over into a form intermediate between the conventional shark hook and the normal *Ruwettus* hook.

It should be said here that while any large round-bottomed wooden hook from the central Pacific may safely be denominated a "shark hook," certain forms are so abnormal, so atypical, so bizarre, that it seems best to omit them from the present study and to consider them in another article. A typical shark hook is simply a big, round-bottomed wooden hook, large enough and strong enough to hold a good-sized shark. It is, in the main, built on the plan of our conventional fish hooks. However, certain large wooden hooks, which in my judgment are simply shark hooks, have been described as *Ruwettus* hooks. To clear up the matter they will be studied first.

### DOUBTFUL FORMS

First to be considered and disposed of are certain huge wooden hooks, mainly from Melanesia, which have been described and figured as Palu hooks. This would seem to be an error. They are now somewhat doubtfully listed as shark hooks, in part at least (it must be confessed) because it seems that they cannot have been anything else.

*New Guinea (Papua).* In another article which appeared in the same year as his first paper, Hedley<sup>1</sup> describes a colossal wooden hook, which he believes to be a Palu hook. This was purchased from a trader at Samarai, Papua, who reported that he obtained it from Milne Bay, New Guinea. This hook, (Fig. 5ab) weighs 1.5 pounds, and has the two arms (nearly square in outline) each 12 inches long (inside measurement) and arising from a markedly bulbous base.

The base of this hook and the shape of the fork certainly resemble the like structures in the undoubted *Ruwettus* hooks previously figured. If it had the characteristic barb it could be accepted as a true *Ruwettus* hook, in spite of its huge size and the bizarre structure at the end of the shank leg. However, two features markedly differentiate it from the undoubted Palu hooks previously studied and from all others which will be considered presently. At the outer end of the shank leg is a bent wooden hoop or loop served with rattan and lashed fast with rattan on

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<sup>1</sup>Hedley, 1897b, 288-291.

the side of the shank at two separate places. Also there are here lacking the knobs on the back side of the top of the shank for holding fast the cord of attachment which is also missing here. This loop increases the length of the shank leg from 12 inches (inside measurement) to 19 inches (outside length). The eye for the attachment of the line measures 2.75 by 1.75 inches. The cross lashings of the loop are 4 inches apart. The method of lashing is clearly shown in the figures.

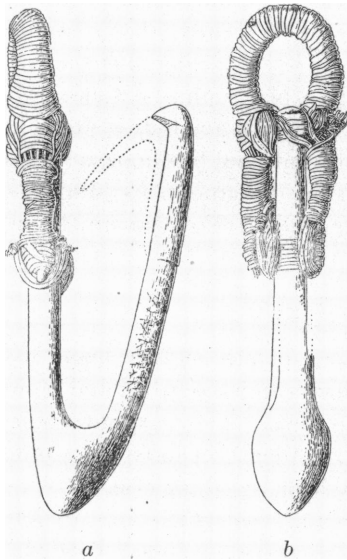


Fig. 5

Fig. 5. A 19-inch Shark (?) Hook from Milne Bay, New Guinea; *a*, right side; *b*, rear view showing bulbous base. After Hedley, 1897*b*.

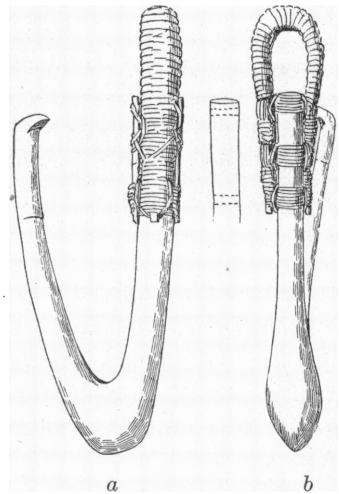


Fig. 6

Fig. 6. A 22-inch Wooden Hook from Milne Bay, New Guinea; *a*, lateral view; *b*, rear view showing barb leg twisted to right. After Edge-Partington, vol. III, p. 78.

The second and particular thing differentiating this hook from true *Ruwettus* hooks is the absence of the barb. On the short leg, 7 inches from the base, is a small shoulder cut on the outside only. The head of the barb leg of the hook has no real barb, but instead a small blunt shoulder or chin directed toward the other limb of the hook. Hedley thinks that both these projections had reference to a barb, not present but reproduced in dotted lines in his figure. He believes that it was fitted on the inner side of the barb leg and braced against the chin. The distance of this chin from the shank would give room for a barb, but

there is no evidence that there ever was such a barb, nor has such a stay for a barb been found in the course of this whole research. The barb leg is, however, slightly twisted to the right of the plane of the shank leg, so that a barb, if present, would point to one side of the shank.

In all the *Ruwettus* hooks examined the limbs are round; or at least elliptical in cross-section, and the barbs are fitted on by scarf joints, all to enable the barbs to be whipped or seized fast with sennit. Here "the limbs are nearly square in section," and while this would help the fitting on of the limb of the barb it would militate very greatly against a secure lashing.

If there were not other evidence to the contrary to present, Hedley's contention that this is a true Palu hook with the barb missing might, even in the face of the above objections, possibly be accepted, but there is such evidence and it will now be set forth. In passing, however, it may be noted that the hook under consideration has been used for catching large fishes of some kind, since the outer side of the barb leg plainly shows scratches made by their teeth.

An almost identical hook with a wooden loop served with rattan lashings is figured by Edge-Partington<sup>1</sup>, and labelled Palu hook (Fig. 6ab). Edge-Partington refers to Hedley's two papers already quoted and, since this latter hook also comes from Milne Bay, New Guinea, I suspect that he calls it a Palu hook in keeping with Hedley's figures and descriptions. Certain it is, as will be shown later, in his invaluable *Album* he figures a large number of un doubted Palu hooks which, however, he does *not* so label.

This hook, like Hedley's from the same locality, is enormously large—22 inches long by 9 wide—, is markedly bulbous at the base, and has the same shaped fork. Its shank end has a loop served with rattan and secured laterally to the shank leg by three instead of two lashings. The barb leg is of the same length as the shank minus the loop, has a shoulder cut on the *inside* near the tip, and has at the very tip a chin or shoulder practically identical with that on Hedley's specimen. The two legs of this hook, like Hedley's, are not in the same plane, the barb leg is twisted slightly to the right, but has the chin directed towards the shank as shown in Fig. 6b. Edge-Partington notes further that there is in the museum of Rome a similar specimen obtained by Finsch at Woodlark (Murua) Island (one of the Trobriand Group), situated about 150 miles to the northeast of the tip of the peninsula of Papua or New Guinea. This hook, like the preceding, shows no trace whatever of a barb.

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<sup>1</sup>Edge-Partington, vol. III, pl. 78.

While I recognize that, without actually seeing these various hooks in use, any distinction between them made from a study of the hooks or their figures must be largely a matter of one's best judgment, still I cannot believe that these are Palu hooks. Rather it seems to me that they are simply huge shark hooks. This judgment is based on the fact that in neither is there a Palu hook barb nor any trace of this characteristic structure, but merely this chin-like projection. In the next place, there is the heavy wooden hoop bent over the outer end of the shank, wrapped and served with split cane, and lashed with wicker to the lateral surfaces of the shank in two places in one hook and three in another. Nothing like this has been found on any of the hooks studied or on any of the figures of undoubted *Ruvettus* hooks that I have been able to find.

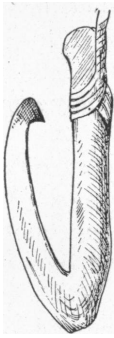


Fig. 7. An 18-inch Wooden Shark Hook from Trobriand Island, lying just off the South-eastern Peninsula of New Guinea. After Finsch, 1888a.

Furthermore, these lashings greatly increase the length of the shank leg, the two legs in the wood being about of equal length.

In the third place, these hooks are very much larger than any true *Ruvettus* hooks found in this research. The first is 19 inches over all and weighs 1.5 pounds; the second is 22 inches long and must weigh about 2 pounds. Such large hooks could only have been used in taking very large and heavy fishes such as sharks. Even a *Ruvettus* 6 feet long could hardly swallow so huge a hook. In my judgment they were intended for sharks. Certain evidence sustaining this belief will now be presented.

*Trobriand.* The figure of another hook similar to the preceding and definitely recorded as a *shark* hook, is reproduced (Fig. 7) from Finsch's *Ethnologischer Atlas*.<sup>1</sup> This hook is briefly described in the text accompanying the "Atlas" as:—

One of the colossal wooden hooks for catching sharks, from Trobriand, but which are also met with elsewhere.

Furthermore, in the narrative<sup>2</sup> of his journeys, he says more explicitly:—

Fishing, moreover, seems to be one of the principal industries of Trobriand, shark fishing in particular being practiced. This is shown by the large foot and a half long wooden hooks ([Atlas] pl. IX, fig. 9) which the natives are extremely reluctant to part with. One can see clearly on these hooks the traces of tooth marks which the sea monsters have left, and the natives know how to give a very vivid pantomime descriptive of the unavailing struggles of the hooked shark, until it is at last killed.

<sup>1</sup>Finsch, 1888a, 11.

<sup>2</sup>Finsch, 1888b, 207.

Hedley, in both his articles, classes this as a Palu hook, but it resembles such a hook only in its general outline, being made out of the fork of a root or a limb of a tree. The short, blunt, chin like barb is very like that figured in Hedley's second paper and by Edge-Partington also, but bears no resemblance to the barb of a genuine *Ruwettus* hook. The outer end of the shank has a rudely carved knob, unlike that found on undoubted Palu hooks, and the lashing of the snood is entirely different,—being a loop-like structure embracing the shank, with its free end ascending from the left rear part of the head of the shank. Another thing leading to the belief that it is a shark hook is its great size. The shank leg is about 18 inches long, the barb limb about 13 inches, and the greatest width between the two about 2.5 inches.

The three hooks, as a study of the figures will show, are structurally very much alike, save that Finsch's hook lacks the wooden bow and wicker lashings of the Milne Bay specimens and does not have the neatly rounded V-shaped fork. That Hedley is in error in calling this Trobriand hook a Palu hook cannot be doubted. Furthermore, the similarity of these three hooks, calls to mind that the Trobriand Islands are adjacent to the D'Entrecasteaux group<sup>1</sup> lying just north of southeast New Guinea and not more than 150 miles distant. Furthermore, the Louisiades are an under-water continuation of this same southeast peninsula of Papua. Geologically, both are thought to be part of this island continent and both are populated by the same Melanesian stock. Edge-Partington reports a hook similar to that shown in Fig. 6ab, and hence similar to Fig. 7 now under consideration, from Woodlark Island, one of the Trobriand Group. From this it is plain that a certain ethnological relationship, as well as a similarity in form and usage, may be claimed for these hooks.

*Maraki (Gilbert Group)*. Since writing the above I have received from Director Willoughby of the Peabody Museum, Harvard University, sketches of four hooks from Maraki Island, Gilbert Group. One of these hooks (Fig. 8) is very like the preceding in the make-up of its barb leg. Here is found the same projection on the inner side of the tip, but, in addition, there is also a slight projection on the outer or front side. Possibly the first is for a barb to fit snugly against and the second to hold

<sup>1</sup>Jenness and Ballantyne (1920), give a comprehensive review of native life at Goodenough and North Fergusson Islands, in close proximity to Trobriand Island. Most of the native villages were inland, and, in consequence, fishing was a secondary economic factor. However, a few of the natives living on the coast did engage in fishing. Yet, the interesting statement is made that the only type of hook known before European hooks were introduced was used in some villages at Kwaiaudli on Goodenough Island which were made from the upper leg joint of a large male phasmid, the long spur of which formed the hook. These hooks were used for fresh water eel fishing (193). Otherwise, fishing was with nets and spears, all kinds being taken in this way, including sharks and dolphins.

a lashing securely. The bend at the bottom is more rounded than in the preceding hooks. The top of the shank leg is curiously bent backwards and ends in a projection to give a firm hold for lashing fast the cord of attachment, which is unfortunately lacking. This hook is smaller than the preceding, the long leg measuring 10 inches, the short 5.5 inches, and the weight being only 6.5 ounces.

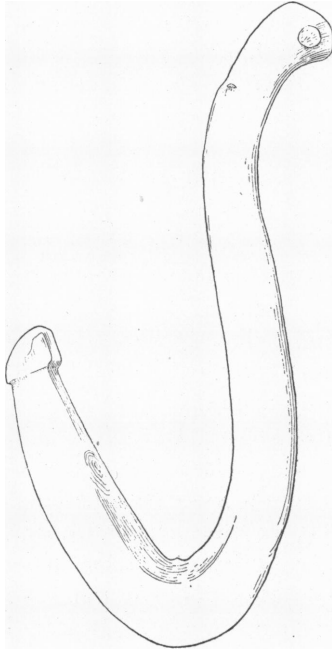


Fig. 8

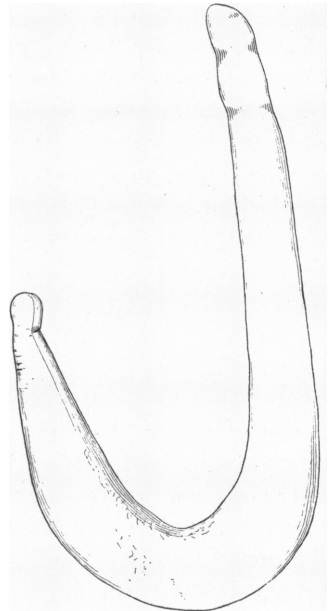


Fig. 9

Fig. 8. A 10-inch Hook from Maraki, Gilbert Group. Collected by Alexander Agassiz in 1900. Sketch supplied by Peabody Museum, Cambridge, Mass.

Fig. 9. A Hook (9.25 inches long) from Maraki, Gilbert Group. Collected by Alexander Agassiz in 1900. Sketch supplied by Peabody Museum, Cambridge, Mass.

Very similar is another hook from Maraki Island in the Harvard collection. (Fig. 9). It has a more rounded base and a straighter shank leg than the preceding hook—indeed the top leans forward. Note the two circumferential grooves made to receive the lashing for firmly securing the line. The barb leg is quite similar to that of the preceding hook, but ends in a smaller point, which may have been intended to act as a stay to a barb. The hook is slightly smaller than its companion. The shank

leg is 9.25 inches long, the barb leg 5.5 inches, the width is 3 inches, and its weight is 6 ounces.

One is very much at a loss to classify these hooks correctly. If the curious terminal structures on the barb leg of each is intended to engage and serve as a stay to a horizontally pointing barb lashed on the inside, then they should certainly be classified as intermediate forms, like the others from Maraki Island, Gilbert Group, figured and described on pp. 237-242, or as true *Ruwettus* hooks. However, they do not have barbs, and as it is impossible to say whether they once had barbs, it seems best to designate them as doubtful shark hooks, since they fall fairly closely in line with the Milne Bay hooks and with Finsch's hook (Fig. 7) from Trobriand. However, since they do lack barbs of any kind, one wonders how they could be used for catching such active fishes as sharks. Be that as it may, Finsch positively assures us that his Trobriand hook was so used, and the inference concerning the others seems plain. Possibly the curious point at the top of the barb leg catches the shark in the gills where it would hold very well if the line were kept taut. This matter will be returned to later.

#### UNDOUBTED SHARK HOOKS

In Hedley's first paper<sup>1</sup> is found a discussion of the wide distribution of Palu and other wooden hooks which he thought were used for Palu catching throughout the central Pacific. His notes have been carefully worked over and his references consulted and checked. Some of these hooks are probably not Palu hooks, as we have seen, others are intended for *Ruwettus*, being practically duplicates of his Funafuti hook, and finally some are undoubtedly normal shark hooks.

*Tahiti.* Edge-Partington figures two other "one-piece" wooden shark hooks, not indeed barbless but without the usual separately made and affixed barbs. These may profitably be considered here. One of these also has a sinker, quite differently attached, however, compared to the preceding. This is a Tahitian hook figured in his vol. II, pl. 18, fig. 4, and reproduced here as Fig. 10. The legend reads:—

Fish-hook of dark red wood attached to a long coil of rope wrapped with fine sennit. Sinker of stalactite. This specimen is in the Wallace Collection, Cumberland Museum, Whitehaven. Another is in the Museum of Science and Arts, Dublin.

This hook is 11 inches long over the barb leg which is approximately as long as the shank leg. Attention is called to the rounded base; to the sharply incurved barb leg ending in a bird-claw barb cut out of the

<sup>1</sup>Hedley, 1897a, 272-276.

leg itself; to the shank leg with its knob on the rear for anchoring the snood; to the tip of the shank ending in a fine point; and finally, to the long snood securely seized to the top of the shank and whipped throughout its entire length with fine sennit. Whether this hook is made from a fork or from a bent branch or root cannot be determined without actual

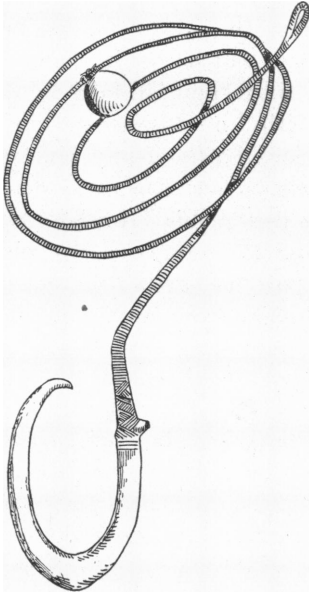


Fig. 10

Fig. 10. . Wooden Shark Hook (11 inches) from Tahiti, with Cord of Attachment and Sinker of Stalactite. After Edge-Partington, vol. II, pl. 18, fig. 4.

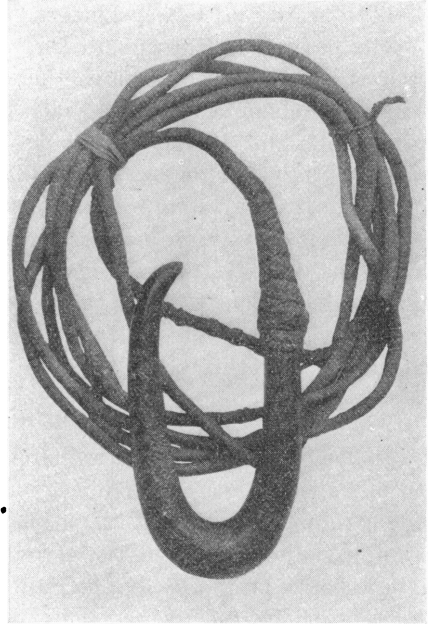


Fig. 11

Fig. 11. Shark Hook from Rarotonga with Broken Off Barb. Deep scratches made by teeth of fishes on the left side of the barb leg. Photograph by courtesy of Mr. W. O. Oldman.

inspection of the hook itself. The origin of the slight hump at the bottom of the outside curve also is not clear. However, on the whole, it appears to have been made of a bent or "grown" root. This is certainly a fine hook and, here again, its sinker and its large size, together with its round shape, lead to the belief that it is a shark hook.

*Rarotonga (Hervey Group).* Remarkably similar to the foregoing is the shark hook from Rarotonga shown in Fig. 11. It is one foot long and 5.25

inches wide and is from the collection of Mr. W. O. Oldman to whom I am indebted for the photograph. The marked similarity of this hook to the preceding is apparent, though its sides are more nearly parallel than the other. It has a long, closely seized cord of attachment fastened on in similar fashion to the pointed top of the shank leg, which has a small knob on the back side to hold the lashing securely. The tip of the barb has been broken off, but it was evidently similar to that of the preceding



Fig. 12

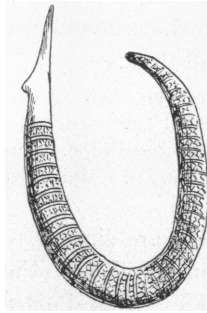


Fig. 13

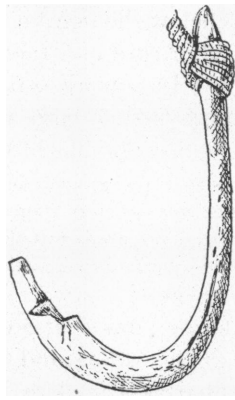


Fig. 14

Fig. 12. A Barbless Wooden Shark Hook (10.25 inches long) from Fiji, with a Stone Sinker attached to the Top of the Shank. The hook is made of a bent mangrove root. After Edge-Partington, vol. II, pl. 117, fig. 12.

Fig. 13. A Highly Ornamented Wooden Shark Hook (11.5 inches long) from Mangaia, Hervey or Cook Islands, now in British Museum collections. After Edge-Partington, vol. I, pl. 9, fig. 5.

Fig. 14. A 12-inch Barbless Wooden Shark Hook from Nukufetau, Ellice Islands. After Finsch, 1893.

hook. The many marks left by the teeth of large fishes on the outer left side of the barb leg plainly indicate hard usage.

*Mangaia.* Almost an exact match for these hooks in its general make up, but differing from them in its lack of a snood and particularly in its highly ornamented surface, is another hook figured by Edge-Partington<sup>1</sup> (Fig. 13). This hook which is in the British Museum, is from Mangaia, one of the Cook or Hervey Islands, not far distant from the Society Islands. In general shape (11.5 inches long) it closely approaches the preceding and, like the other, seems to be made from a bent

<sup>1</sup>Edge-Partington, vol. I, pl. 9, fig. 5.

root, and, while undoubtedly a shark hook in form, was, judging by its highly ornamented surface, probably a ceremonial object. It may be observed, in passing, that the people of this island (Mangaia) are very skilful at carving, practically all their wooden ethnological objects in museums being thus highly ornamented.

In all three of the preceding hooks the barb leg is almost as long as the shank; the base has the conventional round U-shape; the barbs are shaped alike and alike strongly incurved; the shank leg in each is pointed and has below the point a knob on the back side for the secure lashing of the snood or cord of attachment. All three are certainly shark hooks.

*Fiji.* In a work other than the ones previously quoted, Finsch<sup>1</sup>, in speaking of such large wooden shark hooks in the Gilberts, says that they were rare and hard to get and that:—

The size varies greatly as also does the elbow of the end part which forms the hook, since this depends upon the bend of the branches of wood that are used and since these are not easily found in the desired shape. Sometimes these shark hooks are bent to a very obtuse angle and consist of a single branch without the addition of a pointed part.<sup>2</sup>

Then he adds that such hooks are similar to that from Trobriand figured in his *Atlas* and reproduced above (Fig. 7). Such a curved wooden barbless hook is figured by Edge-Partington<sup>3</sup> and reproduced as Fig. 12. Note the stone sinker attached to it. This hook, made from a bent mangrove root, is 10.25 inches over the shank leg. It is from Fiji. Its attached sinker shows that it was used for bottom fishing, and this together with its great size, led to the belief that it is a shark hook.

*Nukufetau (Ellice Group).* Next comes a round-bottomed shark hook which, while barbless now, was plainly intended to receive a barb. Finsch<sup>4</sup> portrays a large wooden shark hook (12 inches long, Fig. 14) from Nukufetau, one of the Ellice Group, a neighboring atoll to Funafuti. He says that it is composed of:—

a branch bent in an obtuse angle to form a hook, the hook end flattened on both inner and outer surfaces, with the point bluntly cut off.

To me, it, like the preceding, is a wooden shark hook, save that the barb is lacking, and to receive a barb it has the outer end cut with an inner shoulder against which to fit the barb before lashing.

It is true that a Palu barb might possibly be affixed to the curiously carved top of the barb leg, but nowhere has a *Ruvettus* barb been attached,

<sup>1</sup>Finsch, 1893, 54.

<sup>2</sup>Finsch, 1893, 54.

<sup>3</sup>Edge-Partington, vol. I, pl. 117, fig. 12.

<sup>4</sup>Finsch, 1893, pl. III, fig. 15.

other than by an actual or modified scarf joint. Furthermore, *Ruwettus* hooks from the Ellice Group are so entirely typical that one can pick them out at first glance. Much more probable is it that this hook is a shark hook and that it had an upwardly pointing barb, the counterpart of that found on certain Hawaiian hooks presently to be considered. Or if it had such a barb as is shown in Wilkes's hook (Fig. 18, p. 229) from Penrhyn, it would be quite like that hook (even having the line attached in an identical fashion). Indeed Finsch himself compares it directly to Wilkes's hook.

*Hawaii.* There is now to be considered a series of round-bottomed shark hooks from Hawaii which, beginning with those having barbs con-



Fig. 15

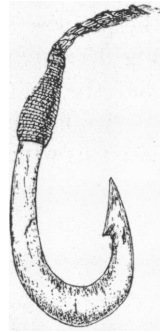


Fig. 16

Fig. 15. A Round-Bottomed Wooden Hook (10.7 inches) from Hawaii. From a photograph by courtesy of the Bishop Museum.

Fig. 16. Hawaiian Shark Hook, 10 inches long, cut out of a Single Piece of Whale's Bone. The largest solid bone hook known. From a photograph by courtesy of the Bishop Museum.

tinuing the curve of the barb leg, lead us, through forms having more and more incurved barbs, to a remarkable type of hook having horizontally placed barbs and used equally readily for taking sharks or *Ruwettus*. Such hooks I have denominated, "intermediate hooks."

In the photograph of hooks in the Bishop Museum, Honolulu, so kindly sent me by Doctor Ball, are two round-bottomed or U-shaped wooden hooks with bone tips. The first of these, is 10.7 inches long over the shank leg, 5.75 inches over the barb leg, and the outside width is 5.56 inches. This hook is, in general shape, markedly similar to Finsch's barbless Ellice Island hook shown in Fig. 14, but differs particularly in that it has a barb set in line with or continuing the curve of the hook.

This hook is made, if one may judge from the photograph, from a bent root. The second hook is also made from a bent root, but one having two slight lateral kinks in it, as may be seen in Fig. 15. The shank leg is slightly shorter (0.7 inches) than that of the preceding; the barb leg measures (over the barb) 6.7 inches long, and the width is less (5.25 inches). Both these hooks are of *kauwila* (*Alphitonia excelsa*) wood, and the triangular bone barbs are lashed on with sennit made of *olona* fiber (*Touchardia latifolia*). How the barb is set in the first hook is not clear in the photograph sent by Doctor Ball. In the case of the second hook, however, the top of the barb leg seems to be cut off squarely at the end and to be slightly flattened on the front side. The barb cut to fit is lashed on the flattened front side by two circumferential lashings in grooves cut for the purpose slightly below the end of the barb leg. For these points see Fig. 15 which portrays the hook in full.

Each hook has the tip of the barb leg cut squarely off and has the base of the barb cut to fit with a downwardly projecting wing or base in front. In each case this wing is let into a slot, square in outline, cut into

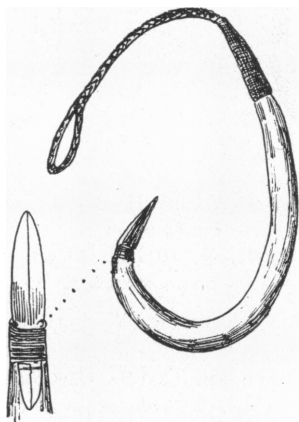


Fig. 17. Wooden Shark Hook, 14.5 inches long, in the British Museum Collection from Hawaii, with Barb made of a Whale's Tooth. After Edge-Partington, vol. I, pl. 56, fig. 6.

the outer or front side of the barb leg. When secured by a good lashing this gives a very securely affixed lash—one suitable for a shark hook. Both hooks are evidently made out of bent roots.

The Bishop Museum possesses two other shark hooks conventional in form, but very unusual in material, in that each is carved out of a solid

piece of whale's bone—either from the shoulder blade of any whale or from the outer end of the first rib of the sperm whale—, shank, base, barb leg and barb being a unit. The first of these hooks has the same measurements as the first wooden hook described above (long leg, 10.7 inches; short one, 5.75 inches; outside width, 5.56 inches). The second hook is slightly smaller than the preceding: shank, 7.12 inches; barb leg, 4.75 inches; outside width, 4.4 inches. These are certainly beautiful hooks and are unique in the material of which they are composed. Fig. 16 is a reproduction of the smaller hook above described.

With reference to Finsch's hook (see Fig. 12) which lacks a barb, this author says that in the British Museum there is a similar wooden hook from Hawaii which has a barb cut out of the tooth of a sperm whale. This hook, which is 14.5 inches long, has been figured by Edge-Partington<sup>1</sup> and is reproduced herein as Fig. 17. The small figure portrays the barb twice magnified to show how it is attached on the outside of the top of the barb leg. The interesting points about this hook are the mode of attachment of the barb and its marked inward pointing. The mode of attachment is practically identical with that found in the two Hawaiian wooden hooks previously described, a method apparently typical of shark hooks from these islands. Unique, however, is the angle at which this hook is set. It is just such a one as has been called Palu hook by Hedley. However, I consider it a shark hook, but one showing the beginnings of an approach to the form of a Palu hook.

Edge-Partington<sup>2</sup> shows similar but smaller bone-tipped hooks from Hawaii, but his figures are too small to distinguish any details—particularly as to how the barbs are attached.

*Penrhyn or Tongareva.* There are now to be studied certain round-bottomed wooden hooks from Penrhyn (Tongareva) Island in the east-central Pacific. Here an interesting hook (Fig. 18) was collected by Wilkes on his famous expedition of 1838–1842. Wilkes gives no data whatever for this hook in his *Narrative* (1845), but it is plainly of fair size, probably 10 to 12 inches over the shank leg. The beautifully symmetrical bend plainly indicates that, like the Hawaiian hooks, it is made from a root grown in the desired form. Why then a lashed-on barb? Either because the barb is

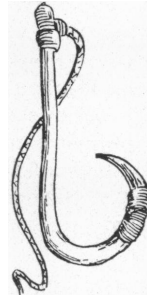


Fig. 18. A Large Wooden Shark Hook from Penrhyn (Tongareva) Island. After Wilkes, 1845.

<sup>1</sup>Edge-Partington, vol. I, pl. 56, fig. 6.

<sup>2</sup>Edge-Partington, vol. I, pl. 57, figs. 5 and 6.

made of harder wood peculiarly fitted for making a piercing point, or because the root was not so trained as to bring about the marked in-curve necessary for cutting down to a barb.

Among the hooks kindly loaned by Curator Hough of the United States National Museum are two collected by the Wilkes Expedition at Penrhyn Island in 1841. The larger of these is much like Wilkes' figure, but certainly is not that hook (if the artist followed his model), for the shank has too much curve, the bend at the bottom is too abrupt, and the lashings are unlike those shown in the figure. Compare Wilkes' illustration (Fig. 18) with the photographic reproduction of this hook (Fig. 19). The shank leg (outside straight line measurement) is 15 inches long; the barb leg, 4.5 inches; the barb measured along the inside of the curve (lashing to tip) is 2.25 inches; and finally the tip approaches within 1.6 inches of the shank leg. This hook is made of very hard and dense wood, and the barb, although a separate piece, is apparently of the same kind of wood. The hook and cord weigh 9.5 ounces.

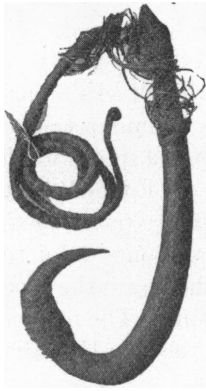


Fig. 19. A 15-inch Wooden Shark Hook from Penrhyn Island, collected by the Wilkes Expedition in 1841. Courtesy of United States National Museum.

The barb is seized fast by two sets of lashings; the inner set (apparently two layers thick), is of a two-strand twisted sennit, and this in turn is covered fairly tightly with a long fibrous material whose source is unknown to me. The whole covers the junction of barb and barb leg so closely that one cannot make out on which side of the leg the barb is spliced. The fowl's spur barb points somewhat upward and slightly to the left of the center of the shank. If the barb leg were twice as long and the barb set on as it is now, it would certainly approach the form of a *Ruvettus* hook, but as it is I can only see a shark hook with a markedly incurved barb.

The cord of attachment, 3 feet long, is a flat braid made of three strands of straight fibers. Near its lower end it is 0.5 inches wide by 0.25 inches thick, but the upper nine inches taper rapidly to the knot at the terminus where it is about one third as large as at the lower end. At the lower end it is separated into its components and these subdivided into smaller strands which are lashed fast around the top of the shank (into which a groove or ring has apparently been cut), and the free ends are then used to seize the lower end of the snood. Finally, the whole was (for

it is now very loose) seized in the same long-fibered material as that used over the lashing of the barb. Also this fibrous stuff was used to seize the whole lower five inches of the cord of attachment. All these things may be observed in the photographic reproduction (Fig. 19).

The smaller of these hooks measures (outside) as follows: length of shank leg in a straight line, 9.25 inches; length of barb leg in a straight line, 5.25 inches; length of barb along inside of curve from lashing to tip, 3.75 inches; greatest width of hook, 2.5 inches; width between point of barb and shank, 1.1 inches. The hook and barb are of a very dense hard wood, but the barb is a separate structure and slightly movable. Whether it fits on the inner or outer side of the shank leg cannot be determined since it is seized fast by a closely wound flat braided sennit covering which is at least three strands deep over the scarf joint; over this is another layer of loosely wound sennit composed of two strands of loosely twisted material. The strongly incurved barb points at the right of the shank about 0.25 inches from the outer edge. Hook and cord weigh 6 ounces.

The cord of attachment is 3 feet, 3 inches long and is composed of three strands of sennit braided together to make a flat cord nearly 0.5 inches wide by 0.25 inches thick. Above, it terminates in a knot; below, it is separated into its components which loop around the top of the shank underneath the knob cut to project on the inner and front side. Covering this lashing loosely are numerous turns of a long fibrous material, which is also used to seize the lower twelve inches of the snood with close-fitting turns.

This hook looks much like Wilkes' (Fig. 18), but is more curved in the shank and has a sharper bend at the base, approaching a rude V-shape. Also the barb is longer, more gently tapered, and points more obliquely upwards towards the top of the shank to which it approaches more closely than the barb of Wilkes' hook.

Doctor Hough,<sup>1</sup> figures and briefly describes a hook made of a bent root and having a lashed-on, incurved, slightly upward pointing barb. This is labelled as coming from Tahiti, but it is so markedly similar to the Penrhyn hooks studied, that I have no hesitancy in pronouncing it a Penrhyn hook. Furthermore, Hough's figure is so nearly absolutely identical with Wilkes' figure that I believe that it was drawn from the identical hook from which Wilkes' figure was made. I communicated my conclusions to Doctor Hough, and investigation showed that the hook in question does come from Penrhyn Island.

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<sup>1</sup>Hough, 1922, 27; pl. 26, fig. 1.

These four Penrhyn hooks all have another marked point of similarity—the cord of attachment is fastened to the inner or front side of each in precisely the same way. Furthermore, all show a high grade



Fig. 20 .

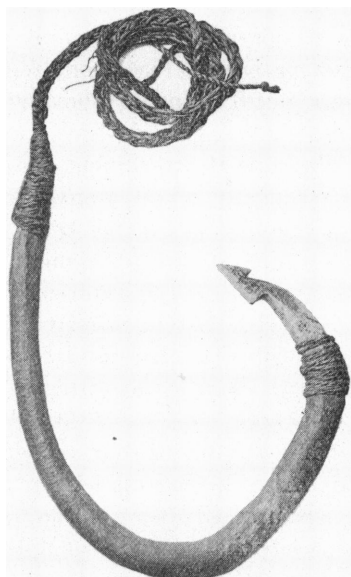


Fig. 21

Fig. 20. Shark Hook with Horn Barb from New Zealand. Length, 7.5 inches, width, 3.75 inches. Courtesy of Peabody Museum, Salem, Mass.

Fig. 21. Wooden Shark Hook with Horn Barb from New Zealand. Courtesy of Peabody Museum, Salem, Mass.

of workmanship. They are all apparently made of roots grown into the desired form, indeed the largest shows some signs of the bending. The hard wood of which the specimens are made has been nicely smoothed (with a shark skin rasp apparently), and the barbs are well made and

accurately joined to the barb legs. Furthermore, they are lashed on better than any barbs yet examined. These hooks have extremely pointed and incurved barbs like the barb on Mrs. David's hook, and Hedley would probably have classed them together with that figured by Wilkes as in all likelihood used for taking *Ruwettus*. And so they might have been used, for these long incurved barbs, so closely approaching the shank, might easily have caught and held a *Ruwettus*.

It is interesting to compare the curves in these hooks with the even more beautiful ones of the hooks shown in Figs. 10 (Tahiti), 11 (Rarotonga), 13 (Mangaia), 15 and 17 (Hawaii). All these hooks are surely made from bent or grown roots and about all the manufacture they have had has been the removal of the bark and sapwood and the fitting of barbs and lines.

*New Zealand.* Among the hooks kindly loaned by Curator Jenkins from the Peabody Museum, Salem, Massachusetts, are two horn-tipped wooden shark hooks from New Zealand. These hooks are very old, the larger having been given to the Museum in 1807; the smaller in 1802. As may be seen (Figs. 20 and 21) they are, in spite of some differences, markedly like the Hawaiian hooks. Each is made of a bent root of some light, but strong wood, approximately circular in cross-section; each has a round U-shaped base; and each is tipped with a lashed-on multi-barbed point; and finally, each has the line attached to the pointed tip of the shank by a circumferential serving.

The larger hook (Fig. 20) weighs 4.75 ounces; the shank leg is 7.5 inches long, the barb leg 5 inches (with barb 6.5 inches), the greatest (inside) width is 3.75 inches, and that between point and shank is 1.75 inches. The greatest circumference is 3 inches. The barb, which is of horn, is 3.25 inches long, 0.75 inches wide, and 0.25 inches thick. It has two double sets of "beards" on the inside and one of three and another set of two "beards" on the outside. The "set" of this barb closely approximates that of the Hawaiian hook in the British Museum (Fig. 17). This barb is lashed on the left side of the tip of the barb leg, and points directly at the shank leg. The snood, 37 inches long, and 0.5 inches in diameter, is made of four strands of twisted sennit. The lashing which attaches it to the pointed tip of the barb leg is seized for thirty-two inches of its length. The snood ends as if it had been cut off, there being no "eye." In fact, this may merely be the outer extremity of the fisherman's line. This hook is notable in having the serving attaching the barb to the barb leg coated in a gum of some kind. No other hook reported in this paper has such. The lacing up of the serving is on the inside of the top of the shank.

The smaller hook is also made of a very light, but hard and strong root, whose greatest circumference is 2.5 inches. It weighs 2.75 ounces, has the shank leg 7.5 inches long, the barb leg 5.5 inches, the greatest width (due to its broad U-shape) is 4.25 inches and that between barb and shank is 2.75 inches. The bone barb is 3 inches long, has "beards" front and back, and has its base in the form of a tongue which is set in a central groove at the tip of the barb leg—tongue and groove lying in the plane of the hook. This hook is not so well made as the preceding, being considerably flattened on both front and back. The cord is lashed to the pointed tip of the shank with the seam on the outer or back side, and is 31 inches long. This cord is loosely braided out of six smaller cords, each composed of two strands, and hence is composed of twelve strands of sennit. It is thickest near the middle region and tapers somewhat down-

ward to the shank, but very markedly so for the upper twelve inches. The diameter at the top of the shank is about 0.1 inch.

These large hooks show no signs of ever having been used. They were, however, certainly made for shark fishing, but may have also been used for catching any large bony fishes, and possibly for *Ruwettus* since, as will be shown later, *Ruwettus* seems to be found in New Zealand waters. This conjecture as to the varied use of these hooks is also based on the fact that in the larger hook the barb closely approaches the shank, while in the smaller it is turned at a sharp angle toward the shank.



Fig. 22. A Wooden Fish Hook, 8.5 inches long, from New Zealand. After Parkinson, 1773.

Sydney Parkinson<sup>1</sup> in his *Voyage of the Endeavor* figures a number of bone-tipped wooden hooks from New Zealand. The largest of these (8.5 inches long) is reproduced here as Fig. 22. This hook, made of a bent root, is markedly like that portrayed in Fig. 20, but has the four-bearded barb pointing almost squarely on the level towards the shank. If it had the *Ruwettus* barb it would certainly be set down as one of the intermediate forms. As it is, it might easily have been used for taking *Ruwettus*, which is presumably found in New Zealand waters. No other hook known to me from this region has similar carved work on the shank. Parkinson's other hooks are very similar in general form and resemble these three New Zealand hooks.

<sup>1</sup>Parkinson, S., 1773, pls. XIII and XXVI.

Mr. W. O. Oldman, the dealer in ethnographical specimens previously referred to, used formerly to issue at intervals illustrated catalogues of such specimens. In No. 76, issued in 1909, he figures a beautiful hook from New Zealand, made of a bent root and having a lashed-on short barb pointing almost horizontally at the shank. The barb is short and the space between it and the shank about equal to half the inside width of the hook. No dimensions are given, but apparently it was of medium size, and of the same general type as those from New Zealand just described.<sup>1</sup>

All these are, in my judgment, shark hooks. Their general structure, their round bottoms, their keenly pointed barbs—some continuing the curve of the barb leg, others incurved in various degrees—all bespeak shark hooks. Some of them, however, make a definite approach toward the *Ruwettus* type. This is shown particularly in their long pointed spur-like barbs, placed more horizontally and with their tips approaching the shank leg more closely. Such hooks are the ones from Hawaii (Fig. 17), from Penrhyn (Figs. 18 and 19), and especially that from New Zealand shown in Fig. 22. This last would certainly take a *Ruwettus* easily. These points of resemblance led Hedley to call those of them with which he was acquainted Palu hooks, and led me to place them at first provisionally among the intermediate types. However, further study has resulted in their being placed among the undoubted shark hooks, next to the intermediate shark-*Ruwettus* hooks.

To sum up: in this section there have been described certain huge and bizarre hooks whose function is not certainly known but which, arguing from their great size and strength, could only have been used for taking sharks. Next to these have been figured and described certain forms intermediate between these and those hooks certainly known to be used by the South Sea islanders for taking sharks. These specimens show the transition in their round U-shaped bases as well as in their huge size. Lastly, a considerable number of undoubted shark hooks have been studied. These are all of great size and strength, and all have the wide U-shaped base. Some are practically barbless and would probably only hold a shark if the line were kept taut, but most of them, however, have

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<sup>1</sup>See Hamilton, 1908, 29, 30, 35, 39. Large wooden hooks are described as being made by bending roots and limbs during growth. A composite shark hook of this type is figured and described (39). Composite hooks from the Taranaki District in New Zealand, as described by Hamilton, bear some resemblance to the *Ruwettus* hooks, though the barb is set at a different angle. Hamilton makes no mention of *Ruwettus*, but assumes that this highly special hook is designed for the taking of a particular species of fish. However, no information as to its use was available to him.

Tregear (1904) states that shark hooks were large, made of wood, with bone tips. They seem to have been used with a line trailing behind the canoe. As in many other parts of the Pacific, human bone is frequently used for barbs and hooks (190).

barbs. Some of these hooks, particularly the bone hooks from Hawaii, have barbs with small "beards" of the conventional type, others have lashed-on bone or wooden barbs which continue the curve of the hook. Finally, in contradistinction to what is found true of nearly all undoubted *Ruwettus* hooks which are made from forks, these hooks are made of roots bent and trained while growing to take the conventional form desired.

## HOW THESE CURVED HOOKS ARE OBTAINED

It will be interesting to ascertain how the beautiful rounded curves of these hooks are worked out, and the earliest and fullest explanation is found in the *Polynesian Researches* of that most accurate observer, William Ellis. He says that:—

The wooden hooks were never barbed, but simply pointed, usually curved inwards at the point, but sometimes standing out very wide, occasionally armed at the point with a small piece of bone.<sup>1</sup>

How much this description is like that of the hooks above mentioned. As to their formation, Ellis says:—

The best were hooks ingeniously made with the small roots of the *aito*-tree, *casuarina*, or iron wood. In selecting a root for this purpose, they chose one partially exposed, and growing by the side of a bank, preferring such as were free from knots, and other excrescences. The root was twisted into the shape they wished the future hook to assume, and allowed to grow till it had reached a size large enough to allow of the outside or soft parts being removed and a sufficiency remaining to make the hook. Some hooks thus prepared are not much thicker than a quill, and perhaps three or four inches in length. Those used in taking sharks are formidable-looking weapons; I have seen some a foot or fifteen inches long, exclusive of the curvatures, and not less than an inch in diameter. They are such frightful things that no fish less voracious than a shark would approach them. In some, the marks of the sharks' teeth are numerous and deep, and indicate the effect with which they have been used.<sup>2</sup>

Corroboratory of this method of growing such hooks is the account by Gardiner of how 'shark' hooks are made at Rotuma, an island about 280 miles northwest of Viti Levu, Fiji. Unfortunately, he gives no figures. He writes that:—

The *fe* or shark hook was made from a shrub, the *tiere*, which when it reached the height of about three feet, was twisted into an open knot, with a diameter of about 5 in., it was then allowed to grow for about two years before being cut. The hook was then shaped, and a piece of hard wood spliced on as a barb projecting inwards. The bait was tied on over the barb; the fish working at this, as the wood was springy, gradually got its jaw between the barb and the stem of the hook. On being struck the barb caught in the gills, and the fish was hauled up sideways.<sup>3</sup>

Very similar is Becke's account of how hooks are grown in the Ellice Islands. He says:—

The hook is made of wood . . . about one and one half inches in diameter, 14 inches in the shank, with a natural curve. . . . These peculiar wooden hooks are *grown*, the roots of a tree called *ngia* ("the hardest wood"), whose wood is of great toughness, are watched when they protrude from a bank, and are trained into the desired shape.<sup>4</sup>

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<sup>1</sup>Ellis, 1830, vol. II, 294.

<sup>2</sup>Ellis, 1830, vol. II, 294.

<sup>3</sup>Gardiner, 1898, 425.

<sup>4</sup>Becke, 1901, 148.

## INTERMEDIATE HOOKS

Certain hooks, to judge from their round U-shape and great size and strength, were probably used for catching sharks, but in structure and position of the barb they certainly follow the *Ruvettus* model and so may have been used for taking large Palu also. They may fairly be designated as intermediate between undoubted shark hooks and undoubted *Ruvettus* hooks. Study of the data presented in this section will, it is believed, make this clear.

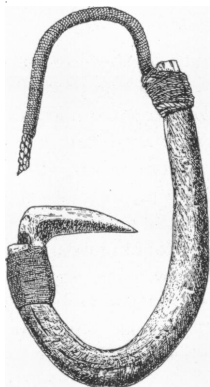


Fig. 23. A 17-inch Wooden Hook of Intermediate Design from Hawaii. Baited with human flesh it was used by the old kings for catching large sharks. From photograph by courtesy of Bishop Museum.

*Hawaii.* Of special interest among the wooden hooks in the Polynesian collection of the Bishop Museum is a huge Hawaiian hook which falls into the classification set forth in the preceding paragraph. It measures: length of shank leg 17 inches, of barb leg 9.7 inches, greatest (outside) width of hook 10.1 inches, weight 3 pounds 4 ounces. It is a typical intermediate hook (Fig. 23). Its shark hook affinities are shown by its great size and wide U-shaped bend, but it has the typical *Ruvettus* barb which, however, points on the level to the shank leg. This barb has a "heel" made by cutting out about half that part of the back of the L which is fitted to the inner top of the barb leg which acts as a "stay." This is securely lashed with about thirty-one turns of sennit. The body of the hook is made of *karuila* wood (*Alphitonia excelsa*). Its barb is also of wood (kind unspecified). The long line of attachment, made of three strands of sennit twisted together, ends above in a double knob and below is broken up into its constituents which are lashed around the top of the shank in a groove cut for the purpose.

The whole lashing at the top of the shank is then secured with about twelve turns of sennit cord, and its free end is used to seize the lower eight or ten inches of the snood.

This huge hook, called by the Hawaiians *makau mano*, is a historic relic well known to them as having been used by their old kings to catch sharks. Furthermore, there is, according to Doctor Ball, a well-established tradition that it was not infrequently baited with human flesh for shark fishing, a slave being sacrificed for the purpose. If it was used for taking *Ruvettus*, the *Ruvettuses* of that day must have been giants indeed.

*Gilbert Group.* In the Peabody Museum, Harvard University, are four fine hooks collected by Alexander Agassiz in 1900 at Maraki Atoll, in the northern half of the Gilbert group. Two of these are barbless and have been considered in the section on shark hooks. However, if provided with barbs like that found in the larger of the two hooks now to be studied, they would essentially duplicate it. But since they are large, barbless (9 and 10 inches long), and since the form of barb is conjectural,

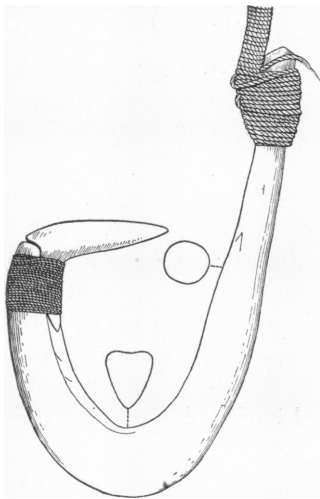


Fig. 24

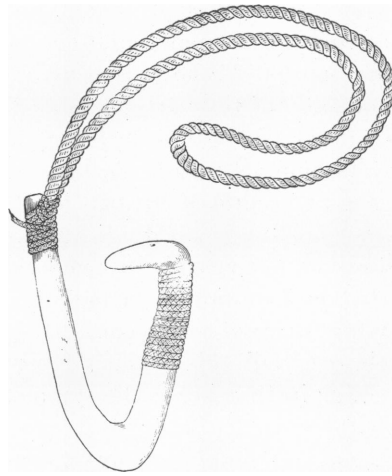


Fig. 25

Fig. 24. A 9.75 inch *Ruwettus*-Shark Hook of Unusual Form from Maraki Island, Gilbert Group. Collected by Alexander Agassiz in 1900. Sketch supplied by Peabody Museum, Cambridge, Mass.

Fig. 25. An Intermediate Hook (6 inches long) from Maraki Atoll. Collected by Alexander Agassiz in 1900. Sketch supplied by Peabody Museum, Cambridge, Mass.

it has seemed best to consider them among the shark hooks, where they fit in admirably. Shark-fishing, it may be added, is a favorite sport in the Gilberts. The peculiar forms of the other two hooks, especially their U-shaped bases, and the unusual form and manner of setting of their barbs, together with their small sizes (6 and 9.75 inches) have, in the final analysis, led me to consider these hooks, not as shark hooks as first thought, but as intermediate forms.

The larger hook (Fig. 24) has a shank leg 9.75 inches over all with an average diameter of 1 inch; the barb leg measures 5.45 inches, and the greatest (inside) width of the hook is 3.25 inches. The barb measures

on the outside 2.9 inches, on the inside 2.1 inches, and approaches to within 1.4 inches of the shank. The shank leg is approximately circular in cross-section and measures 0.9 inches in diameter. At the bend, the cross-section is that of an inverted triangle with the basal corners rounded (1.1 inch vertical by 1 inch horizontal). The snood is 48.5 inches long to the eye for the attachment of the line, and this eye adds 4.5 inches more to its length. The snood of two sennit cords tightly twisted together, is lashed fast to the inner top of the shank, and is secured by twenty-nine turns of small sennit cord. The lower half of the snood is firmly seized with a small sennit cord and has a diameter of 0.5 inches.

The base of the hook is bent or carved into a decidedly open U. The inner side of the barb leg is flattened and at the top the rounded sharp-pointed barb (0.75 inches in diameter) is affixed in the most peculiar fashion yet found. As may be seen in Fig. 24, the barb is so cut that it has an accurately fitting "heel" behind, and the whole barb looks like a foot held up vertically in the air. The back of the ankle and the heel fit on top of the barb leg and the 'ankle and leg' are scarfed down and fitted on the inside of the barb leg and held fast by a lashing of about twenty-five turns of sennit cord. This gives a very solid attachment for the barb, essentially like that in the big Hawaiian intermediate hook (Fig. 23), and, as in that hook, the symmetrical barb points almost horizontally at the shank.

This is, in a number of ways, one of the most interesting hooks yet described. It is a very strong hook, thanks to its long shank and short barb legs, the large diameter of the wood in the barb leg and in the bend, and the large size and shape of the barb. Its greatest peculiarity is in the remarkable manner of affixation of the barb. It plainly belongs among the intermediate forms since its rounded U-shaped base is that of a normal shark hook, while its horizontally placed Palu barb allies it to the *Ruvettus* hooks. Again, it is clear that its considerable size (9.75 inches over the shank leg) fit it for taking either medium-sized sharks or large specimens of *Ruvettus*.

Its marked similarity to the big Hawaiian hook has already been apparent to the reader. Both are made of U-shaped bends, their barbs are similar and are identical in attachment, and their similar snoods are attached to the top of the shank leg on the inner or front side in exactly the same fashion. Practically the only differences are that the Gilbert Island hook is smaller and better finished.

The smaller hook (Fig. 25) has a slightly rounded V-shaped base, 1 inch in diameter. The shank leg is 6 inches long and 0.6 inches in

diameter; the barb leg 4.75 inches long and 0.7 in diameter. The hook is 2 inches wide inside, and has a barb 1.75 inches long, measured on the outside, and 1.1 inches on the inside, which approaches within 0.9 inches of the shank. This rounded blunt barb, pointing horizontally at the shank, is lashed to the top of the barb leg by eighteen turns of flat braided coconut sennit. It could hardly penetrate the tissues, but caught in the gills or a fold of the tissues would certainly hold—the line being kept taut. A cord of attachment, in the form of a 15-inch loop of two-strand twisted coconut sennit, is fastened to the inner side of the top of the shank leg. This whole apparatus, weighs only 2.25 ounces.

Among the photographs and descriptions of hooks in the Bishop Museum, Honolulu, are data for six hooks from the Gilberts (no particular atolls being designated). One of these is an abnormal Palu hook (p. 285), another seems to be a true *Ruvettus* type (p. 294), the remaining four are all intermediate. They are all fabricated apparently of wood, have U-shaped bases, and large wooden barbs. Their measurements (in inches) are shown in the following table:—

Number	1	2	3	4
Shank leg	7.1	7.5	7.6	9.5
Barb leg	4.5	5	5.25	4.9
Inside width	4.7	5.1	4.1	4.8
Bishop Museum No.	7101	7512	3461	5813

Nos. 1, 2, and 3 are approximately the same size; No. 4 differs only in that it has a longer shank leg. All are stout, heavy hooks of medium size, made of roots bent into fairly symmetrical U-shaped bases; numbers 1 and 2 form very open U's, 3 and 4 relatively narrow ones. All have large fine-pointed barbs set almost at right angles to the top of the barb leg and hence directed obliquely upward. The barbs of Nos. 1, 2, and 3 are nearly straight on the bottom edge and slightly curved on the top surface, while that of number 4 is slightly claw-like. All are set on the inside of the top of the barb leg apparently by simple scarf joints (one has a slight heel) and are securely lashed fast to this by many turns of a fibrous cord (in one layer save in the case of No. 1). In three hooks the top of the barb leg projects above the lashing about even with the bend of the barb and acts as a stay. Hook number 3 has a slight heel on the barb over the end of the barb leg. In all four hooks the barb is very securely set.

The shank legs of numbers 1 and 4 extend nearly straight upward and have the cord of attachment secured on the inner side by lashings of sennit in several layers. This is very clumsy looking, but apparently

very secure. Hook number 2 has the cord of attachment in the form of a loop secured by circumferential lashings—one just below the top divided into two sections by a knob carved on the back of the shank leg, and another some three inches down the leg. Hook number 3 has the outer end of the shank leg pared down on the back side and shaped into a knob at the top for the secure anchorage of the line (which, however, is absent).

These hooks are not very large, but they are strong, and solidly constructed, as may be seen in Fig. 26, representing number 2 of the table. They all have the round U-shaped bases of typical shark hooks

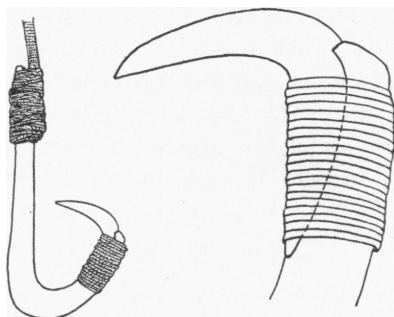


Fig. 26. A Hook from the Gilbert Islands, now in the Bishop Museum, Honolulu. The second figure shows the details of attachment of the barb. Courtesy of Bishop Museum.

but all have fairly typical *Ruwettus* barbs which, as the hook hangs from the line, point obliquely upward instead of obliquely downward.

Just here it will be of interest to add that Finsch writes:—

At the Gilberts, where in 1841, Wilkes was offered hooks in numbers, I found (1880) no specimens save the huge wooden hooks for catching sharks and the *Ruwettus* fish (*Purgierfisch*, *Ruwettus* or *Thyrsites pretiosus*).<sup>1</sup>

This we may take as an undoubted reference to our intermediate hooks.

*Ellice Islands.* Becke describes the growing of round-bottomed wooden hooks in these islands which are near neighbors and lying to the south of the Gilberts. His account is as follows:—

The hook is made of wood—in fact the same as is used for shark-fishing—about one and one half inches in diameter, 14 inches in the shank, with a natural curve; the barb, or rather that which answers the purpose of a barb, being supplied by a small piece lashed horizontally across the top end of the curve. These peculiar wooden

<sup>1</sup>Finsch, 1914, 132.

hooks are *grown*, the roots of a tree called *ngiia*, whose wood is of great toughness, are watched when they protrude from a bank, and are trained into the desired shape.<sup>1</sup>

This hook with a round U-shaped bend and a horizontal barb is nothing more or less than a transitional type. Indeed Becke describes it as a hook used for taking Palu, but also says that it is "the same as is used for shark-fishing." It is a source of great regret that Becke nowhere in any of his books gives a figure of the hook when writing about fishing for the Palu.

*Rotuma.* Directly south of the Ellice Group is the solitary outlier, Rotuma. Concerning the growing of hooks on this island, it will be recalled that Gardiner as quoted on p. 237 states that these are called *fe* and are developed by twisting the stem of the *tiere* shrub into an open curve. After growing for about two years it was cut.

The hook was then shaped and a piece of hard wood spliced on as a barb projecting inwards. The bait was tied on over the barb; the fish working at this, as the wood was springy, gradually got its jaw between the barb and the stem of the hook. On being struck the barb caught in the jaws and the fish was hauled up sideways.<sup>2</sup>

The hooks were made in different sizes for different fishes.

This sounds so much like directions for making an intermediate form of hook that I wrote Doctor Gardiner about it. He very kindly answered that whereas the hook from the Ellice Islands was made from a *fork*, in Rotuma

it was made of a single stem which was grown to the proper shape and tied up while the growth went on. The result was much greater strength [at the bottom of the curve] as the grain ran continuously around the angle which you will readily understand was not really an angle but a curve. I was struck with the cleverness of these people in growing a fish hook to the shape they required.<sup>3</sup>

Gardiner calls this a *fe* or shark hook, but in his letter states that this hook was used at Funafuti for taking a certain "cod-like" fish (*Ruvettus* surely) in deep water. "In Rotuma I never saw the same fish, but it undoubtedly occurs." And the hook is as undoubtedly an intermediate hook with which both kinds of fish were taken. It is greatly to be regretted that Gardiner gives no figure of this apparatus.

*Tahiti.* Another intermediate hook, but one more closely approaching the true Palu form, is shown in Fig. 27. It is a Tahitian hook from the collections of the Peabody Museum, Salem, Massachusetts. This colossal hook, which weighs 1 pound, 3.25 ounces, is 15.25 inches long over the long leg and 9.75 inches over the short one. The barb is 4 inches long over all, and approaches within 1.4 inches of the shank leg. As well

<sup>1</sup>Becke, 1901, 148.

<sup>2</sup>Gardiner, 1898, 425.

<sup>3</sup>Gardiner, personal letter.

as can be determined, this hook is carved out of a root of a tree having very dense and very hard wood. In cross-section any part of the hook would be triangular, with the apex outward or downward, that is, on the inside the surface is flat, while around the outside a ridge forms the apex of the triangle. This is most marked at the bottom of the bend, whence it decreases as one slips one's hand toward either extremity. The circum-

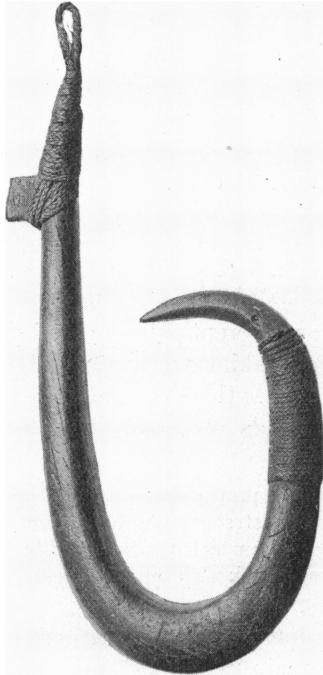


Fig. 27

Fig. 27. A Huge (15.25 inch) Wooden Intermediate Hook from Tahiti. Courtesy of Peabody Museum, Salem, Mass.



Fig. 28

Fig. 28. A Colossal Hook of the *Ruwettus*-Shark Type from the Society Islands. Length, 13 inches; weight, 2 pounds 2.25 ounces. Courtesy of United States National Museum.

ference of the hook is 5.25 inches at the bottom of the bend, 4 inches just below the lashing of the barb, and 3 below the shoulder on the shank leg.

The shank leg terminates in a knob with a point above. The base of a very abbreviated snood is securely looped below the shoulder and around the top and is further secured by a seizing of flat braided sennit. The total length of hook and snood is 17 inches. The horizontally flat-

tened barb, which is distinctly of the *Ruvettus* type, is scarfed on its left base to fit the top of the barb leg which in turn is flattened on its right side. The fit is excellent and the whole is seized fast with about thirty-five turns of flat sennit.

The hook shows clearly the traces of much use, for the teeth of many fishes have left their signs manual. The deepest marks (not the most) are found within the curve and on the side not shown in the figure. That it was used for taking sharks is to be deduced from its huge size, and that it may also have been used for Palu fishing may be inferred from the unmistakable Palu barb, but one wonders how large a *Ruvettus* must have been to swallow the barb leg of so huge a hook.

Fig. 28 is a photographic reproduction of another gigantic wooden hook of the same make up as the preceding. It too was collected in the Society Islands (in 1898) and was loaned by the United States National Museum. All in all, it is the largest wooden hook I have ever seen. Its weight, with its attached snood, is 2 pounds and 2.25 ounces. The shank leg is 13 inches long; the barb leg, 10.25 inches (both measured in straight lines); and the inside length of the barb from lashing to tip, 2.75 inches. The opening between barb and shank, to the left of which it points, is 2.25 inches. The greatest width of the hook is 5.5 inches. A cross-section of the hook at the center of the U would give a triangle with all corners rounded, while that of either leg would give a quadrilateral figure with rounded corners and one side shorter than the others. The circumference, just below the lashing of the barb, is 5.25 inches; in the center of the bend, 5.5 inches; below the lashing of the snood 5 inches. Apparently this great hook is made of a large root bent and grown to order, and then trimmed to the present shape. It shows the tooth-marks of many large fishes, as may be discerned in Fig. 28.

The barb, which is somewhat more typically Palu-like than that of the preceding hook, is set on the left side of the top of the barb leg. It is lashed fast by a seizing of flat braided sennit made up of three straight (untwisted) strands and averaging 0.25 inches wide. This lashing is everywhere two layers deep; at one level there are three layers as the photograph shows. The outside end of the braid is caught up on the left side of the barb leg. From the inner angle of the barb the lashing extends down the barb leg a distance of five inches. The barb is slightly spiralled to the left. This barb, it should be noted, is flattened in a vertical plane—the only such found in this research.

The snood is 2 feet 9 inches long, is looped over the typical saddle-shaped top of the shank leg, and ends above in an eye 1.75 inches long.

Its structure is not easily made out as the figure shows. At its lower end it seems to be broken up into its constituents, and on each side three strands of two twisted cords each are caught up under the circumferential lashing of braided three-strand sennit, while other strands are looped under and wound around the two knobs. The whole is seized for a distance of 5.25 inches with a circumferential lashing in two or more layers, of which twenty-one turns of flat, braided sennit of three strands can be made out in the outer layer. The inner layer seems to be made of two strand twisted sennit. The snood, which seems to be made up of a

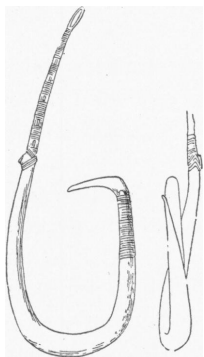


Fig. 29. Large Wooden *Ruvettus* ("Shark") Hook, about 14 inches long, from Tahiti. After Edge-Partington, vol. II, pl. 20, fig. 7.

number of separate strands of fibrous material loosely "laid", is for its lower fifteen inches rather closely seized with the upper free end of the flat braided sennit used in lashing it to the hook. Thence to the eye at the top, the snood is somewhat loosely seized with a two-strand twisted sennit cord. The circumference of this cord at its largest point is 3.25 inches and at its smallest 2.5 inches and it will average at least 3 inches. At the outer end it terminates in an "eye" having an opening 1.75 inches long by about 0.5 inches wide.

As is shown in Fig. 28 the structure of the cord of attachment is hard to analyze, but one gets the impression that it is immensely strong. In short, the whole apparatus is evidently intended to take the largest sharks that swim the waters of the Society Islands. That it has done so is plain when one notices how much of the wood has been chewed away on the left side of the bottom of the U. Apparently the sharks have been caught with the hooks in the right side of the mouth.

Another and a very beautiful intermediate hook, also from Tahiti, is that figured by Edge-Partington (Fig. 29) from a specimen in the collections of the British Museum. This, as usual, he labels "shark" hook. This is undoubtedly a *grown* hook judging from the wide-rounded U-shaped base, made from a root trained into the shape shown. The length given for this hook is 26.5 inches, of which the highly ornamented snood accounts for nearly one half (say 12 inches). The top of the shank leg terminates in a point having below this on the back side the customary knob or shoulder. The base of the line of attachment is securely

<sup>1</sup>Edge-Partington, vol. II, pl. 20, fig. 7.

anchored below this and is whipped fast to the top of the shank by seizings of which five additional bands surround the cord which ends in an eye. The pointed tip to the shank, the single knob, and the ornamental seizing seem to characterize many hooks from Tahiti (Fig. 10).

The unmistakable Palu barb is lashed fast to the left side of the top of the barb leg. This, however, does not point directly to the shank, as does the barb in the Peabody Museum specimen, but barb leg and barb are spiralled to the right. How much care was given to detail in making this hook, may be seen not merely in the lashing and building up of the snood, but also in the barb leg, the tip of which has been carved with a slight shoulder to prevent the lashing from slipping off.

This hook, like the preceding from Tahiti, is also a combination apparatus. Its great size, and enormous U-shaped bend proclaim its function as a shark hook, but the characteristic *Ruvettus* barb (the most Palu-like of any found in these intermediate hooks) equally strongly claims it for a *Ruvettus* hook. It is interesting to note that in this hook the place of attachment of the barb on the left side is exactly that found in the other Tahitian hooks.

*Paumotus*. After the greater part of this section was written, further search brought to light an article confirming my conjectures as to the use of the hooks under consideration. Doctor L. G. Seurat,<sup>1</sup> a French naturalist residing in the Paumotus, published an article which effectually settles the matter of these intermediate hooks. His striking figure of a hook procured from Fagatau Island is reproduced here (Fig. 30). This hook is made from the wood of the *miki-miki* tree, with a lashed-on barb of the same kind, and is 8.8 inches long and 7 inches wide (outside measure apparently). Other hooks were larger. The point of the barb is widely separated from the shank, but lies in the same plane, i.e., points directly to it. The line is securely lashed to the inside of the top of the shank. Finally it has the round, U-shaped bend of the typical shark hook, and the definite barb of the *Ruvettus* hook.

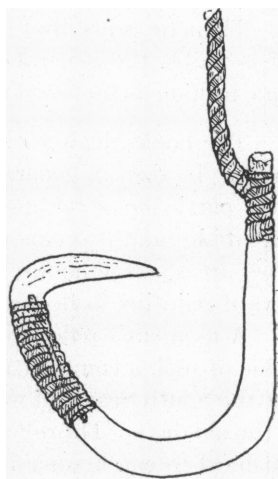


Fig. 30. An 8.8-inch Wooden Hook from Fagatau, Paumotu Group, used for taking both Sharks and *Paru* (pronounced *Palu*). After Seurat, 1905.

<sup>1</sup>Seurat, 1905, 296.

As to its use, Seurat tells us that when he was at Fagatau the natives still used it to take sharks, despite the fact that iron hooks could be procured. The pointed barb readily enters the gills of the shark and holds it fast. Seurat says of the hooks that:—

The indigenes designate hooks of this type, with a reentrant right angle barb, under the name *kao*. At Reao they call it *maga* because of the recurved point approaching the shank (*maga* signifying point, barb, in the Taumotuan tongue).<sup>1</sup>

He further continues:—

These large hooks of wood are likewise employed in fishing for an enormous fish called *Uravena* (*Ruvettus pretiosus* Cocco) which lives at great depths.<sup>2</sup>

Then he adds that the natives of the Taumotus designate these fishes under the general name *Paru* which word is pronounced in the same fashion as the word *Palu* used in other parts of Polynesia.

The hooks dealt with in this section are denominated intermediate forms. In size, in general outlines, in material (wood), and in many of their particular structures, they are fitted for taking either sharks or large Palu, and it seems certain that they were used for both purposes. They are all large hooks, with the round bend of the shark hook and the inward-pointing lashed-on barb of the true Palu hook.

A moment's reflection on the part of the reader will make clear the value of such a combination hook. Sharks abound everywhere throughout the South Seas and were a chief source of flesh food for atoll dwellers of the old days. The oilfish—a large strong fish also—was a great dainty, but hard to catch since it was found at considerable depths and could be gotten only in the dark of the moon. After a surfeit of shark's flesh, its oil must have been in great demand. Suitable forks or bent stems and roots were hard to find and hard to work up into the desired hook. What then could be better than to make a combination hook which would readily take either fish?

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<sup>1</sup>Seurat, 1905, 297.

<sup>2</sup>Seurat, 1905, 297.

## TRUE *RUVETTUS* HOOKS

We will now turn our attention to hooks which were undoubtedly used for *Ruvettus* fishing; hooks made of forks carved into V-shapes or more or less acute angles, not made of roots bent U-fashion; hooks having lashed-on more or less right-angled or obliquely downward pointing barbs, with but few exceptions made of wood,—in short just such hooks as those from the Ellice Islands which were studied in the first section of this article. The hooks now to be considered all come from the south- and west-central Pacific.

The plan adopted for this section is to take the various groups of islands one by one, starting with Polynesia and continuing through Micronesia and Melanesia; to consider the hooks from each group of islands, giving the literature first and then taking up new and non-descript hooks and figuring and describing them. In this way it is believed that a systematic and comprehensive survey of all the known material can best be made.

### *RUVETTUS* HOOKS FROM POLYNESIA

*Ruvettus* hooks have a wide distribution in Polynesia, are found in use in more island groups there than in any other of the Pacific islands. Here also intermediate forms of hooks are found. And finally, our first knowledge of *Ruvettus* hooks<sup>1</sup> came from Polynesian islands. For this reason it seems best to begin our study of these hooks with this region of the South Seas, and with the group (Ellice Islands) in which they were first studied, this group being also about the center of this particular region.

*Ellice Group.* *Ruvettus* hooks were first collected and reported from the Funafuti Atoll, Ellice Group in 1896, and here our study will begin. This at once calls for a backward glance at the hooks figured and described by both Hedley<sup>2</sup> and Mrs. David<sup>3</sup> earlier in this paper (pp. 214 to 216, Figs 2, 3, and 4).

Among the South Seas hooks in the ethnological collections of the United States National Museum are three Palu hooks collected by Doctor H. F. Moore at Funafuti, Ellice Islands, while naturalist on the "Albatross" in 1899. The dimensions of these hooks are given in the following table, all measurements in inches:—

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<sup>1</sup>Hedley, 1897a, 272-276.

<sup>2</sup>Hedley, 1897a, 272-276.

<sup>3</sup>David, 1899, 248-250.

Number		1	2	3
Shank leg	{ Outside	9.2	10.0	10.5
	{ Inside	7.25	8.75	8.5
Barb leg	{ Outside	7.25	8.7	8.25
	{ Inside	5.5	6.2	5.9
Barb	{ Outside	2.4	2.9	2.25
	{ Inside	2.0	2.4	1.75
Space barb to shank		0.15	0.4	.0
Greatest inside width		2.2	2.8	2.1
Weight in ounces		2.5	3.25	3
U. S. National Museum No.		206283	206282	206284

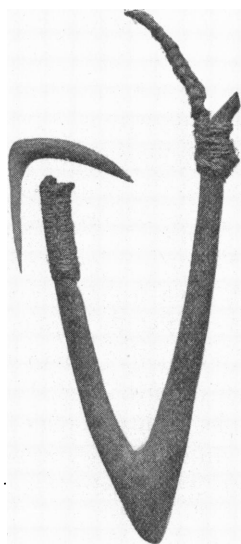


Fig. 31. Hook from Funafuti, Ellice Islands. Collected by Doctor H. F. Moore in 1899. Courtesy of United States National Museum.

Hook No. 2 is portrayed herein as Fig. 31, and its structure can plainly be made out. The cord of attachment is 23.5 inches long and is a flat braid, made of three strands of untwisted fibers. The lower 19.5 inches is 0.5 inches wide and 0.25 inches thick. The upper three inches is composed of two strands of sennit simply twisted together. The lower end of this cord is looped below the hind projection of the 'saddle,' and is there secured by about a dozen turns of flat, braided sennit made of three strands. The saddle is identical with that on Hedley's specimen (Fig. 2), the top of the shank being bevelled backwards to give the line a straight pull when a fish is struggling on the barb. The long curved fowl-spur-like barb is set by a scarf joint on the inside of the barb leg exactly as is Hedley's, and at the top the "heel" is supported by the tip of the barb leg just as in Hedley's specimen. This barb, being loose, has been detached and the photograph shows how carefully and accurately this scarf joint has been made. This barb is secured by twenty turns of a three-ply flat braided sennit with the loose end caught up on the

left side. The barb points on the level at the shank, the space between being about half an inch. The barb is flattened vertically and is slightly spiralled to the left.

Hook No. 1 differs from No. 2 in details only. The base is more flattened in the right to left diameter and the shank leg is slightly more rounded, i.e., approaches the outline of Hedley's hook. The cord is

23 inches long, is slightly smaller than that on hook No. 2, has the same two-strand twisted tip 4 inches long, and is attached in the same way to an identical saddle. The barb is secured with eighteen turns of flat sennit, with the loose end caught up on the left side, and is identical with the barb of the preceding hook save that it is more twisted to the left of the shank. This barb points somewhat more downward than that of No. 1, and on being removed is found to have identically the same form and setting as the preceding. This hook is intermediate in form, though not in size, between Nos. 2 and 3.

Hook No. 3 is longer than No. 2 and has the same round curve on the shank leg as is found in Hedley's specimen. In fact this hook, save for being somewhat larger and particularly in having a longer, slenderer, and more pointed barb, is practically identical with Hedley's hook.<sup>1</sup> As in hook No. 1, the base is flattened and the legs keeled inside and out, but more sharply than No. 1. The cord is 23 inches long, nineteen inches being a flat three-strand braid, the upper three inches a two-strand twist. The saddle and attachment are exactly as in the others. The fowl-spur barb points almost on the level, i.e., base and tip lie in the same horizontal plane, but about one quarter of an inch to the left of the shank. If it pointed straight at the shank it would touch it, but being spiralled to the left there is, between the side of the barb and the side of the shank, a space of 0.25 inch. The barb is lashed on by seventeen turns of a flat three-strand braided sennit cord, the loose end of which is caught up on the left side. This hook is a close counterpart of the other two, especially of No. 1, and is markedly similar to Hedley's hook.

Here we have four Palu hooks from Funafuti, Ellice Islands (Hedley's plus three in the United States National Museum), all markedly alike not merely in general outlines, but in many details. Doctor Moore's three hooks are marvellously alike. They are all made from the same material (a dark red wood); have legs and bases flattened and keeled on both inner and outer edges, appearing in cross-section as very flattened ellipses ending in acute angles rounded at the tips; have cords almost identical in material, size, shape and length; have identical short "saddles" with the same long, high, backwardly pointing "pommels"; have the same hooked fowl-spur barbs, set with inside scarf joints supported by shoulders, whipped fast with the same kind of sennit which is caught up and fastened in the same way on the same side. All the hooks show excellent workmanship, with the wood neatly smoothed, probably

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<sup>1</sup>Hedley, 1897a, 275.

with sharkskin rasps—one of which Hedley figures.<sup>1</sup> In my judgment it seems probable that all three hooks in the National Museum collection and possibly Hedley's also were made in the same village and, it is entirely possible, by the same man.

Lying southeast of Funafuti, and about sixty-five miles distant, is another atoll, Nukulaelae by name. This was visited for two days by the Funafuti expedition, and here Hedley got the crude wooden fork<sup>2</sup> shown in Fig. 3, out of which it had been planned to carve a Palu hook.

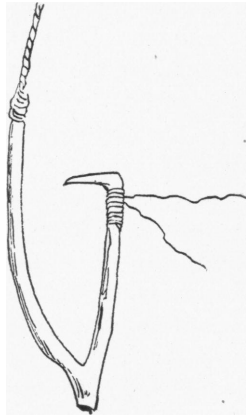


Fig. 32



Fig. 33

Fig. 32. A Palu Hook (4 inches long) from Nukulaelae, Ellice Islands. After Edge-Partington, vol. II, pl. 96, fig. 1.

Fig. 33. Palu Hook from Nanumea, Ellice Group. Length, about 7.5 inches. After Brill, 1897.

A hook from this atoll, labelled "deep sea fish hook," is figured by Edge-Partington<sup>3</sup> and is reproduced as Fig. 32. Here the rough fork (see also Fig. 3) is plainly to be seen in its freshly cut off state, the base being wholly unfinished. The barb is spliced on the outside of the short leg. The legend reads:—

"Deep sea fish hook. The bait is fastened on the upper angle by the string attached thereto. The fish bites along the horizontal hook and gets it caught in the corner angle of the jaw." Rev. J. Powell.

Every effort has been made to find where Mr. Powell has written on these fish hooks, but in vain. The method of attachment of the line to the

<sup>1</sup>Hedley, 1897a, 274.

<sup>2</sup>Hedley, 1897a, 272-276.

<sup>3</sup>Edge-Partington, vol. II, pl. 96, fig. 1.

shank is very crude, this being apparently lashed fast to and in a notch at the top of the shank leg.

This is one of the crudest hooks found in this investigation in that so little work has been done on it—in fact it looks like an emergency hook. However, the general shape, the form and “set” of the barb, and particularly the directions for attaching the bait proclaim it an undoubted *Ruvettus* hook. Furthermore, if the base were carved carefully, following the natural curve of the wood there would result just such a curved shank

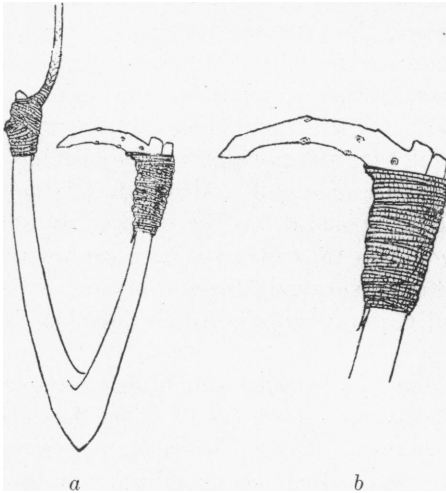


Fig. 34

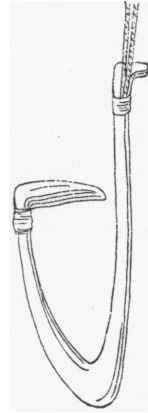


Fig. 35

Fig. 34. An Ellice Islands (?) Hook, 10.9 inches Long. The roughly made barb (enlarged) shows the unsmoothed knots and the “heel.” Drawn from a photograph by courtesy of the Bishop Museum, Honolulu.

Fig. 35. A Palu Hook, 6.25 inches long, obtained in Samoa, but said to have come from the Ellice Islands. After Krämer, 1906.

leg as is shown in Hedley’s specimen (Fig. 2) and in the largest of the Ellice hooks in the National Museum collection, previously referred to.

In the same year that Hedley’s article appeared (1897), the firm of E. J. Brill, publishers and booksellers of Leyden, issued an illustrated catalogue offering for sale a collection of ethnological objects from the South Seas. On pl. VI, fig. 365, is represented a fish hook (Fig. 33) from Nanumea (or Nanomea), the most northwesterly outlying atoll of the Ellice Group. Note its resemblance in general form and shape of the base to other Ellice Islands hooks. The top of the shank leg is somewhat different, but has the same two shoulders and the saddle between. The

barb is much shorter and has a greater space between its point and the shank; it seems to be spliced on the inner side of the top of the barb leg. This is, however, surely a Palu hook.

Another crude but very interesting hook from the Ellice Islands, but one still having some of the characteristics of hooks from that group is among the collections of the Bishop Museum, Honolulu. It is merely labelled Ellice Islands, without indication as to what atoll it came from. This hook (Fig. 34) is 10.8 inches over the long leg, 9.7 inches over the short leg; the greatest outside width of the hook is 5 inches, and the distance between the shank and the tip of the barb is 0.5 inch. As will be seen in the enlarged figure of the barb, this has evidently been cut crudely from a fork and a part of what is apparently the main stem of this fork has been left as a "heel". Of this barb, Doctor Ball writes "Rough knots not smoothed off, as if left intentionally." The lashings of both barb and cord of attachment are of sennit. Although it is not so well finished as other Ellice Islands hooks, it has the bend of the shank leg, the claw-like barb, and the stay at the top of the barb leg found on both Hedley's and the United States National Museum hooks. It is an undoubted *Ruvettus* hook and it is probably correctly labelled as coming from the Ellice Islands.

Next come certain accounts by Krämer which, however, are rather 'left-handed' and add little to our knowledge of Ellice Islands hooks. Krämer describes *Ruvettus* fishing at Makin,<sup>1</sup> the extreme northwest atoll of the Gilbert or Kingsmill Group, which is a neighboring group of atolls lying to the northwest of the Ellice Islands in Micronesia. He figures a crude wooden *Ruvettus* hook which was 6.25 inches long over the shank leg and 5 over the other, and which had a barb 1.75 inches long. He states that he obtained this hook from Samoa, but that it came from the Ellice Islands. He does not seem to have been able to get a hook made at Makin. In 1906, Krämer published a popular narrative of his wanderings in the South Seas, but without adding anything of interest for this paper. He re-figures the "Purgierfisch" hook slightly differently from the figure in his earlier paper. Since this figure<sup>2</sup> shows the attachment of the snood (on the left rear side), and the other omits it, it is reproduced here (Fig. 35). With the exception of MacGillivray's hook (p. 329), this is the crudest hook found in this research.

Among the hooks listed for sale by Mr. Oldman was a hook and float said to be from the Ellice Islands. This was purchased by this Museum,

<sup>1</sup>Krämer, 1901, 182.

<sup>2</sup>Krämer, 1906, 258.

but, when it came, the first glance showed that it was not an Ellice Islands hook and that it was of Melanesian origin. Its history and description will be given later in its proper place.

There are in the Australian Museum, Sydney, two *Ruvettus* hooks labelled "Ellice Islands?" The interrogation mark showed that the authorities of the Museum had doubts about the correctness of this identification. Their large size (12 and 13 inches, respectively) led me also to doubt, since no known Ellice hooks are so large. Then when they were described as having the tops of both barb and shank legs wrapped with palm spathe, I was quite sure that these particular hooks did not come from the Ellice Group. A request to the Museum for a photograph brought one and the first glance showed that these hooks were in no particulars related to the known Ellice forms. They will be described later in their proper place.

*Tokelau or Union Group.* A Polynesian archipelago near to and east of the Ellice Islands, the Tokelau or Union Group, furnishes us with a number of *Ruvettus* hooks of interesting form. These will be taken up in their historical order of description and then the new and undescribed hooks will be figured and described.

Somewhat unlike the other *Ruvettus* hooks just portrayed, but undoubtedly a true Palu hook, is that figured and described by Lister<sup>1</sup> from Fakoa, Fakaofo, or Fakaafo (Bowditch Island), the most southeasterly atoll of the Union Group. This hook, a drawing of which is reproduced (Fig. 36) is made of a decidedly U-shaped wooden fork. The shank leg, apparently of the branching part of the fork, has the backwardly projecting knob over which the snood is looped before being lashed fast. Above this, the shank is trimmed to a point, as in several hooks previously described. The outside of the shank leg has the peculiar curve found in hooks from the neighboring Ellice Group.

The top of the barb leg seems to be cut squarely off as in the Hawaiian shark hook portrayed in Fig. 15. On this the inward and downward pointing blunt barb is fitted by what appears to be a flat scarf joint on the front or outer side of the leg. But in the figure the scarf leg of the

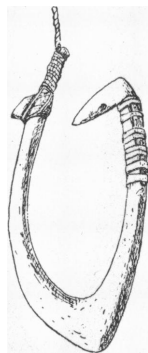


Fig. 36. Wooden *Ruvettus* Hook from Fakoa (Bowditch Island), Union Group. After Lister, 1892, pl. IX, fig. 1.

<sup>1</sup>Lister, 1892, 58.

barb, which is held fast by six circumferential sennit lashings, appears very thin and slight and it would seem that a strong upward pull on the barb proper by a large fish would probably break the point off at the bend. The probable explanation of the manner of affixing the barb will be found in the description of the next Bowditch hook.

The above hook is about 5 inches long but:—

The large hooks are about a foot long and have the lashings protected by wrappings of the strong spathes of the coconut.<sup>1</sup>

These data Lister obtained on a ten-day visit to the group in 1889. However, he did not hear of the "purgative fish" and questions the use of these remarkable hooks for taking sharks.

Among the hooks loaned by the United States National Museum are two collected by Major Rich in 1874 and labelled as coming from Bowditch Island, Tokelau Group. The larger of these is very finely finished, as may be seen in Fig. 37. Its dimensions are: long leg, 11.5 inches; short leg, 11.2 inches; greatest width between legs, 2.75 inches. The inside length of the barb is 2.5 inches and the space between barb and shank is 0.4 inch. The long slender barb is lashed on the outside of its leg by various turns of flat sennit spaced at five irregular intervals, with two to five turns at a place. The whole is then wrapped on the front and on the sides with two layers of the fibrous material found ensheathing the base of each leaf of a coconut palm. This, in turn, is lashed at the bottom and middle with two turns of a flat-braided three-strand

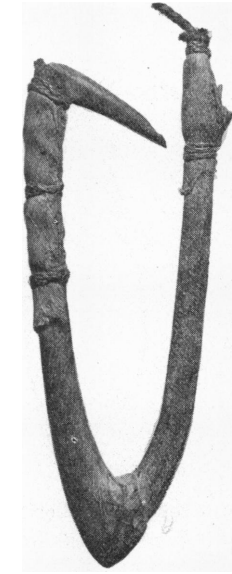


Fig. 37. A Large (11.75 inch) *Ruwettus* Hook from Bowditch Island, Union Group. Courtesy of United States National Museum.

sennit, and at the top by three turns of the same. The coconut cloth is folded over the front edge, but behind is an open space revealing the lashing underneath (Fig. 37).

The remarkable thing about this barb is its method of fixation. Being loose it was carefully detached, and to my surprise, I found the inner side of the lower leg of the barb cut in a V throughout the whole of its length and not flattened, as usual. This V fits into a corresponding triangular groove furrowed out on the outer or front side of the top of the

<sup>1</sup>Lister, 1892, 58.

barb leg producing a very unique and effective method of attaching the barb of a *Ruvettus* hook. Fig. 38 is a lateral view of the whole barb and gives a cross-section of its base and of the barb leg showing how the latter is fitted into the former.

The cord of attachment is 3 feet 6 inches long, including the double knots in which it terminates above. It is made of three strands of straight fibers plaited together, and is about 0.3 inches wide, and 0.6 inches thick. At the lower end, it is separated into its components which are looped under and around the crude large and small knobs on the back side of the top of the shank which ends in a point with the line whipped fast to its inner side. The whole is enclosed on the inner or front edge and on the sides with a double layer of coconut leaf sheath (open behind), held down with two lashings of three strands of braided flat sennit below and two above, the loose end being carried up on one side of the knobs and down on the other. The striking points about the knobs are that they are separated only by a narrow furrow or groove, that the smaller is above, and that the lower (which is evidently the base of a limb) is at least four time larger than the upper.

In this hook, like the preceding, the shank leg is made of the smaller branch, the barb leg of the larger. The shank leg has been little worked beyond paring down ridges and knots; the barb leg, however, has apparently been considerably reduced in size. In cross-section it is a very flat ellipse, the outer or front edge being rather keel-like and becoming markedly so towards the base. This is, on the whole, a well finished true *Ruvettus* hook.

The smaller of the two hooks in the United States National Museum, collected by Major Rich in 1874, is also said to be from Bowditch Island, but after prolonged study, I have come to the conclusion that it has the same origin as the American Museum hooks said to be from Tonga. I can discover in it no affinities with the known Bowditch hooks, but it is almost a counterpart of the Tongan hooks and will be described with them (p. 266).

Fig. 21 of Oldman's catalogue No. 76, issued in 1909, represents a *Ruvettus* hook purporting to be from Fakaafu (Bowditch Island), Union

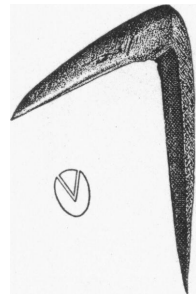


Fig. 38. Barb of Bowditch Island Hook shown in Fig. 37, showing Hooked Point and Slender Base. Insert shows in cross-section how barb is set in top of barb leg.

Group. The figure is very small, but it is evident that the barb is set on the outside of the straight barb leg and is lashed fast by about eighteen turns of twisted two-strand sennit. The line seems to be a flat braid of sennit securely fastened to the head of the shank. Here again, the barb leg is the main stem, the shank made of the secondary branch. The shank leg, which appears to be round, is curved very like the shank leg of Funafuti hooks. The barb is of the ordinary type, but lacks the coconut 'cloth' covering to the lashing. The hook is possibly more like a Funafuti hook than like the typical ones from Bowditch. It hardly seems necessary to reproduce this figure. Personally I doubt very much the correctness of its labelling.

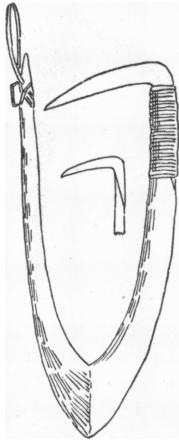


Fig. 39. Palu Hook from the Union Group, now in the British Museum Collection. After Edge-Partington, vol. II, pl. 96, fig. 2.

Later in answer to a letter of inquiry, Mr. Oldman writes that on October 3, 1924, he had on hand another hook from Fakaofu. Measurements for this hook were—length of shank leg, 9.5 inches; length of barb only 2.5 inches; clearance (distance of point of barb from shank) approximately 0.4 inch. No data are at hand as to which leg of this hook is made from the main stem.

Another *Ruvettus* hook (of hard brown wood), from the Union Group, is figured by Edge-Partington.<sup>1</sup> This hook (Fig. 39) is 10.5 inches long and is beautifully finished from a fork. The secondary figure shows that the barb is attached on the outside of the barb leg which is notably long, reaching to the level of the knob on the shank leg. The top of the shank leg is pointed as in Lister's hook from the same locality, and on the back side has the invariable knob for securely looping the line, here attached, however, in the most primitive fashion, yet seen. Here again, the barb leg is carved out of the main stem of the fork; the shank out of the branch. This hook is in the British Museum, and, since Edge-Partington, in the legend to his figure, expressly refers to Lister's article, it may possibly have been collected by Lister. It is, however, a better finished hook than that described by him. Attention is called to the fact that it also lacks the protecting covering of coconut cloth. It should be noted that this hook is simply credited to the Union Group, and not to Bowditch Island where Lister avers that all the large hooks have the coconut sheathing. It may be that this protecting device is peculiar only to this particular island of the group.

<sup>1</sup>Edge-Partington, vol. II, pl. 96, fig. 2.

As noted on p. 255 the Australian Museum has two hooks of unknown source but thought possibly to have come from the Ellice Islands. On the contrary, I am quite sure that they did not come from these islands and fairly sure that they did come from the Tokelaus and probably from

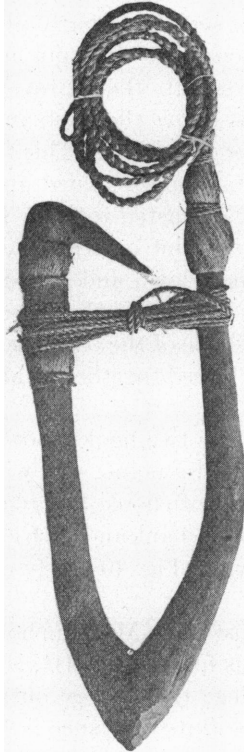


Fig. 40

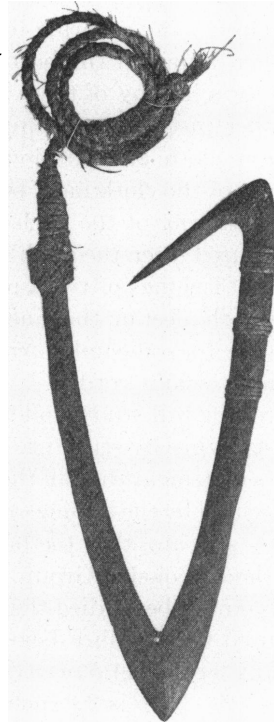


Fig. 41

Fig. 40. A 13-inch Hook, presumably from Fakaofu, or Bowditch Island. Photograph by courtesy of the Australian Museum.

Fig. 41. A 12-inch Wooden Hook of Unknown Origin, but herein assigned to Bowditch Island. Photograph by courtesy of the Australian Museum.

Bowditch Island. The largest is a strong hook 13 inches over the shank leg, 11.75 over the barb leg; the greatest outside width is 4.4 inches; the barb is 1.75 inches long; and the clearance between its point and the shank leg is 0.9 inches. The line is of three-ply coir sennit.

If this hook (Fig. 40) is compared with those from Bowditch Island shown in Figs. 36 and 37, it will be seen that it has the general shape com-

mon to the others. Furthermore, the barb leg seems to have been cut out of the main stem of the fork; the barb has the same form and pitch as the barb of Fig. 37, and under a glass has the same minute peculiarities; the shank at the top is whittled to a point and below it at the rear is the single blunt knob for securing the line of attachment. Above all, the coconut cloth covering of the lashings for snood and barb allies it with Bowditch hooks. The covering for the snood was first put on up-side down and then lashed at the bottom with sennit; then it was turned up and secured by a lashing of three turns just above the knob and another of like number just below the upper end of the shank. This turning up of the coconut cloth gives its lower edge a smooth folded appearance. The free edges of the cloth meet behind. Contrasted with the foregoing, the "cloth" covering of the barb lashing was put on with the free end above and secured, then the cloth was turned down and seized by three circumferential lashings of two turns each of sennit. Here also, the free edges of the cloth meet on the inner or back side of the barb leg. Finally, the two legs are, for some unknown reason, lashed together by about eight or nine turns of sennit cord.

If the reader will study under a glass the two hooks shown in Figs. 37 and 40, structure by structure, and point by point, and will bear in mind Lister's statement that all the large Fakaofu hooks had coconut fibre coverings, secured by the lashings at the tops of shank and barb legs, he will be convinced, as I am, that the hook shown in Fig. 40 surely came from Bowditch Island, Tokelau Group.

There is now to be studied the other Australian Museum hook doubtfully attributed to the Ellice Islands. This hook, (Fig. 41), is 12 inches over the shank leg and 11.5 over the barb leg; the greatest outside width is 5.1 inches; the barb is 2.6 inches long and its clearance is 1.4 inches. The line is of three-ply coir sennit. At first it was thought that it would have to be described as a *Ruvettus* hook of unknown source, but careful study has convinced me that it comes from the Tokelaus and probably from Bowditch Island. The reasons for this conclusion will be set forth in the following paragraphs.

In general shape this is little like the other Bowditch hooks, but more like that shown in Fig. 39—a hook in the British Museum from the Union Group (island not specified). However, here again the barb leg is made of the main stem of the fork, while the "pitch" of the barb is almost identical with that shown in the hooks in Figs. 36, 37, and 40. Again the shank leg terminates in a point and below this at the rear is the blunt knob for securing the line which has apparently been unlaid

and lashed below the knob and around the point of the shank. This was then covered with a fibrous material with the inturned edge below, exactly as on the hook shown in Fig. 40. Finally, the whole was secured by many turns of a small three-ply braided sennit cord which is not a part of the line since it is smaller than one of its components.

In structure and manner of affixing the barb is so entirely unlike anything found on any hook in this research as to call for a careful description. Its point is longer and slenderer than that on any other Tokelau hook but it has absolutely the same pitch. The outside of the "knuckle" has a sharper bend, but the inside bend is very like that in the other hooks—especially that of Fig. 40. The barb is lashed by three sets of turns of sennit cord exactly as was found underneath the coconut cloth sheath of the barb leg of the Bowditch hook (Fig. 37). If these lashings were covered with coconut cloth after the fashion of the hook shown in Fig. 40, it would have the same appearance. Particularly notable, however, is the joint by which the barb is set on the top of the barb leg. This is bevelled obliquely downward and inward and is apparently flattened on the front side to receive the barb which is cut to fit underneath the bend and which has the leg part cut apparently into a thin flat scarf to fit.

Now if the reader will examine with a glass the barb shown in Fig. 40, he will find, just above the folded edge of the coconut cloth, the oblique joint where barb and barb leg are fitted to each other. In other words, the barbs of the hooks shown in Figs. 40 and 41 are set on the top of the barb leg in the same fashion by a joint not found in any other *Ruvettus* hooks and hence are presumably from the same island. However, the photographs of course give no idea of how the barbs are set onto or into the length of the barb leg. A letter to Mr. W. W. Thorpe of the Australian Museum brought the interesting information that the barb of each hook is let into the top of the barb leg by the V-shaped joint. This point, together with the ones above set forth, definitely establishes the fact that these hooks are surely from Bowditch or Fakoa Island in the Tokelau or Union Group.

Before leaving these Fakoa (Bowditch Island) hooks, it should be emphasized that in all four of these hooks seen in the wood or in figures, the smaller or barb limb is always made of the main branch of the fork, the shank or larger leg of the hook of the smaller branch of the fork—a thing not found in any of the other hooks. The measurements, in inches, of the three large hooks which have been minutely described, are given in the following table. The first hook is in the United States National Museum, Nos. 2 and 3 are in the Australian institution.

	Measurements	1	2	3
Long leg	{ Outside	11.5	12	13
	{ Inside	9.5		
Short leg	{ Outside	11.2	11.5	11.75
	{ Inside	9.2		
Barb	{ Outside	3.25	2.6	1.75
	{ Inside	2.5		
	Tip to shank	0.3	1.4	0.9
Inside width		2.75	5.1	4.4
Museum numbers		15108	E23502	E23501

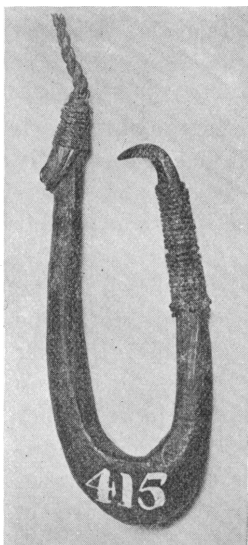


Fig. 42. A *Ruwettus* Hook from Tokelau (?), made from a Narrow Fork and provided with a Tortoise Shell Barb. Courtesy of Peabody Museum, Salem, Mass.

Among the hooks kindly sent me by Curator Jenkins of the Peabody Museum in Salem is one said to be from the Tokelau or Union Group—particular island not designated—presented to the Museum in 1821. Its form is so unusual that it is described apart from the other Tokelau hooks. As may be seen from Fig. 42, it is a well-made wooden hook, with a round U-shaped curve at the bottom, and nearly parallel legs. The shank leg is 3.5 inches long, the barb leg without the barb is 2.75 inches, but with the barb 3.12 inches, and the greatest width is 0.75 inches. The barb proper itself is 0.8 inches long, outside measurements, and 0.4 inside. It is made of tortoise shell, is set by a scarf joint on the right side of the barb leg, and is spiralled so that it points to the left of the shank to which it approaches within 0.25 of an inch. It is secured by twenty-five turns of twisted sennit cord. The shank leg has one knob, or shoulder, above which it is whittled to a point. The line, made of two strands of twisted sennit is looped under the shoulder and seized fast to the pointed top. This line is 17.5 inches long and ends above in a double knot. This hook differs markedly from the other Tokelau hooks in the parallel position of its legs, in its short tortoise shell barb (a material not hitherto used), and, to a lesser degree, in the manner of attachment of the line. These peculi-

arities set this hook entirely apart from the other Tokelau hooks; indeed, it is so unlike the others that there is grave doubt whether it came from these islands. Personally, I think that it did not, but as I am unable to assign definitely any other island as its place of origin, it is left here provisionally. However, if I should hazard a guess, I would assign it to Niüe, whose hooks will be considered on p. 278.

*Tonga.* If we take the Ellice Islands for one angle of an inverted triangle and the Tokelaus for another, then the Tongas may well form the apex. And to this group we will turn next.

There are in the ethnological collections of the American Museum six *Ruwettus* hooks from the South Seas. Obtained by purchase some time in the 80's of the last century, our only information is that these hooks are alleged to be from the Tonga Islands. Now, so far as I know, there is but one account of *Ruwettus* fishing in the Tongas. However, there is every reason to believe that *Ruwettus* could be taken in all of the Tongas for they are low, steep-sided, coral atolls lying between the parallels of 170° and 180° W. longitude and under and on both sides of 20° S. latitude. Indeed Becke<sup>1</sup> says that while *Ruwettus* is found at Tonga it is reported as rare—possibly because it has not been much fished for. So it may well be that these hooks are really from Tonga.

Of these six hooks, five form a beautifully graded series in size and make-up. Tabulated, their dimensions are as follows in inches:—

*Ruwettus* Hooks from Tonga in the American Museum

	Measurements	1	2	3	4	5
Shank, leg	{ Outside	9.4	7.0	4.5	3.75	3.5
	{ Inside	7.1	5.4	3.7	2.9	2.6
Barb, leg	{ Outside	7.5	6.3	4.0	3.3	3.0
	{ Inside	4.8	4.3	2.8	2.25	2.0
Barb	{ Outside	2.4	1.7	1.06	0.9	0.8
	{ Inside	1.7	1.2	0.75	0.5	0.5
	{ Tip to shank	1.1	0.75	0.5	0.4	0.6

American Museum Nos.

S-4339

S-4340

S-4341

S-4342

S-4343

These five hooks are almost identical in plan. All are made from forks of practically the same outline and apparently from the same kind

<sup>1</sup>Becke, 1901.

of wood. All have the barb leg plus barb almost as long as the shank leg, certainly reaching to the lower knob on the shank leg. Nos. 1, 2, and 4 have the barb lying in the same plane as the legs, i.e., pointing slightly to the right of the shank (holding this next to the eye). In No. 5 the barb points slightly to the left of the shank. If one looks at the hooks all laid on a plane surface, the barb of No. 1 points most sharply downward, the others become flatter and flatter until No. 4 in which the barb points on a level to the shank. The barb of No. 5, however, points downward at a sharp angle. In all five the barbs are lashed on the outside of the barb leg, but there are differences in the disposition of the loose end of the lashing cord. Looking at all the hooks with the shank next the eye, No. 1 has the loose end caught up on the right outer front side, No. 2 squarely in front, No. 3 on left front side, Nos. 4 and 5 squarely on the left side.

These hooks show practically an identical mode of fastening of the snell or cord of attachment for the fisherman's line. Each has two knobs at the outer back side of the shank leg. The lower one is so cut as to point obliquely downward; the upper seems to be cut like an inverted shoulder. The back of the shank of each hook between these projections is somewhat hollowed out into a gentle concave saddle-like surface. The basal end of the snood is looped under the armpit of the lower knob and securely lashed on the inner or front side of the top of the shank by circumferential turns of sennit over the saddle between the knobs. The end of the strand of sennit used for lashing on Nos. 1 and 2 (the two largest hooks) is drawn up on the inner right side of the shank (examined from behind). In the three smaller hooks it lies on the inner front side of the top of the shank. The two large hooks (Nos. 1 and 2) have the lower end of the snood wrapped for a distance of 1.25 and 1.5 inches above the top of the shank. In every hook the snood is attached on the inner or front side of the top of the shank.

The cord of attachment on hook No. 1 is made of three strands of hard twisted sennit and is about 0.4 inch in diameter. It is 17.5 inches long from the top of the shank to tip of the neatly worked "eye" at the upper end. This "eye", for the attachment of the fisherman's line, is 0.75 inches long by 0.55 inches wide. It is seized in flat bands of sennit, as is the upper end of the cord for a distance of about two inches downward from the point of the eye. The lower end of this cord also is seized in flat sennit for a distance of 1.25 inches above the top of the shank. The snell of hook No. 2 (Fig. 43) is also seized in flat sennit for the first 1.5 inches above the shank. It too is made of three-ply twisted sennit,

but ends above in a simple knot instead of an eye. Below this knot, the sennit is worked into a cingulum and the whole cord has been tied into a second single knot below the first.

To hooks Nos. 3, 4, and 5 are attached what are apparently the remnants of the fisherman's lines. These are all made of two strands of twisted sennit, ending in simple knots to prevent the strands from disintegrating into the fibers of which each is composed. The line attached

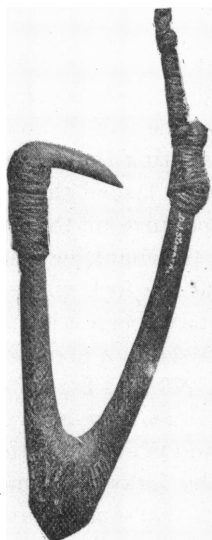


Fig. 43

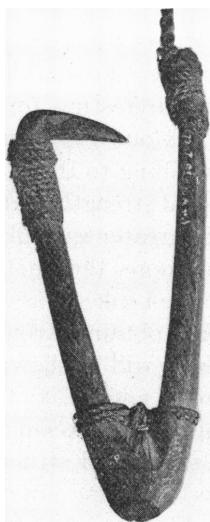


Fig. 44

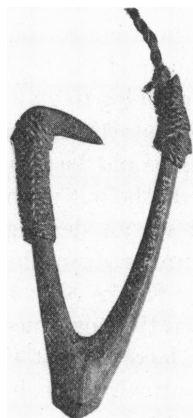


Fig. 45

Fig. 43 (S-4340). A *Ruvettus* Hook from Tonga. The inner side of the barb leg shows that many fish have tried their teeth on it.

Fig. 44 (S-4341). A *Ruvettus* Hook injured by having a Chip taken out of the Left Side of the Base during the working of the Fork and strengthened by a Lashing to repair the Defect.

Fig. 45 (S-4343). The Smallest *Ruvettus* Hook from Tonga.

to hook No. 3 is 31 inches long and shows no seizing at the base above the shank, that on hook No. 4 is 26.5 inches long and is wrapped for 0.25 inch at the lower end; and the one on hook No. 5 is 31 inches long and is wrapped at the lower end with three turns of the cord lashing it to the upper end of the shank. The cords of Nos. 3 and 4 are about 0.13 inch in diameter, that of No. 5 about 0.09 inch in diameter. Even this smallest cord, old as it is, is very strong and even now would hold a good-sized fish. The cords of the two larger hooks would when new, probably, have easily held ten foot sharks.

As we examine one after the other we find less and less finish on these hooks. No. 1 is the best finished, especially at the base which is very neatly rounded off. The outline of each leg in cross-section is a rounded ellipse. This hook shows very few signs of tooth marks and apparently was little used. Hook No. 2 is not at all worked at the base and while the legs of the V are round this is probably the natural form of the fork. The inner side of the short or barb leg, from the lashing to the base of the inner V, is roughened and cut by the teeth of many fishes (Fig. 43).

Hook No. 3 (Fig. 44) shows the knife marks and, like the others, the marks of what may have been the shark skin used as a rasp to smooth the wood. This hook is very interesting, for at the left base of the inside V the knife of the maker took out a deep chip and fearing that he had weakened the hook, but unwilling to throw it away, he lashed the base of each leg to give it additional strength, putting three turns on the barb leg where the strain would be greater and only two on the shank leg where this would be less. Furthermore, the knot is inside the fork where it would be out of the way. The hook seems never to have been used. In the section dealing with hooks obtained from New Zealand, a hook with a similar strengthening lashing will be shown (See p. 277 and Fig. 57).

Hooks Nos. 4 and 5 are so much alike that they may have been cut from the same bush and finished by the same hand, and in every particular have almost the same shape and structure. The forks are almost identical. The bases show the same cuts made in the same relative positions. The barbs are alike, cut almost at the same angle. One is lashed with seventeen, the other with nineteen turns of sennit, and both have the loose end of the cord brought in on the outer left side of the base of the barb. In each the lashing at the head of the shank has three turns below the lower knot and eight above. Both hooks show evidence of considerable usage. The smaller of the two is shown in Fig. 45.

Hook No. 6 although alleged to be from Tonga, has been excluded from consideration here, for, though it is certainly a *Ruwettus* hook, it is so eccentric and unusual in form that it is placed with other like hooks in the sub-section on "Eccentric *Ruwettus* Hooks" (see p. 291).

Among the hooks loaned from the collections of the United States National Museum is a small one (No. 15109) labelled "Tokelau or Union Group." This hook (previously referred to on p. 257) is wholly unlike any other Tokelau hook and is so nearly a facsimile of our Tonga hooks that it will be described with them (Fig. 46). Its barb is almost a counterpart of that of Fig. 44 and the general shape almost duplicates Fig. 43, save only that its limbs are smaller. Its description follows.

Its shank leg is 4.6 inches long; the barb leg 4 inches. The greatest width between the legs is 1.1 inch, and the barb, which points to the left of the shank, reaches to within 0.5 inch of it. The barb of this typical *Ruvettus* hook is set on the outside of the barb leg by a flat scarf joint and lashed to the barb leg by seven and nine turns of sennit separated by a space. The cord of attachment, made of two twisted strands of sennit, is looped over the two crude knobs on the back of the top of the shank,

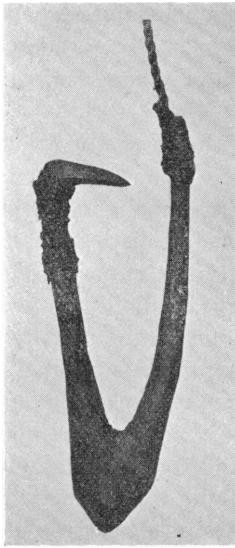


Fig. 46

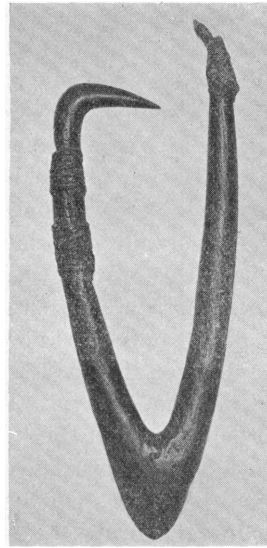


Fig. 47

Fig. 46. An Alleged Bowditch Island Hook. Note its marked resemblance to the hooks from Tonga shown in Figs. 43 to 45. Courtesy of United States National Museum.

Fig. 47 (80.0-4325). A Finely Finished Palu Hook from the Cook or Hervey Group.

and lashed to the inside of it by turns of a small sennit line. This cord, which may merely be the lower part of the fisherman's line, is 22 inches long. It is peculiar in that the lowest portion is the smaller, the middle larger, and the upper end slightly larger than the lower end.

The short, rather blunt, and almost straight pointing barb is set on the outside of the top of the barb leg. It is secured by a lashing of twisted sennit divided into two sections. The lower has seven turns, the upper about nine (partly in two layers), with the loose end of the cord caught up on the left side.

This hook is crudely made, some of the bark still remaining on the right side of the crotch. The barb leg is made of the main stem and the shank leg of the branch. The base is roughly cut to a point. The wood seems to have been roughly smoothed with a shark skin rasp, although these marks may in part be the impressions of sharks' teeth. In every one of these points, as well as in the others previously referred to, this hook duplicates the Tonga hooks and has absolutely nothing in common with Tokelau hooks,—all of which may be seen in the photographic reproduction (Fig. 46). It seems clear then that this so-called Tokelau hook and those said to have come from Tonga were made on the same island. Probably they are all from the same village and were possibly made by the same man.

*Cook or Hervey Group.* Southeast of the Tonga or Friendly Islands lies the Cook or Hervey Group. There are, so far as I can ascertain, no published figures or descriptions of *Ruvettus* hooks from these islands, but Mr. Oldman, kindly informed me that he had a small and finely made hook from this group—specific island not named. This was purchased by the American Museum and made available for study.

This hook, the only one known from this group, is unique in several ways as may be seen in Fig. 47. The shank leg is 5.5 inches long, the barb leg 5 inches long over all. The barb is 1.1 inch long on the outside and 0.9 on the inside and the "clearance" between its point and the shank is 0.5 inches. Both legs, base, and barb are nicely rounded, smoothed, and polished. On the rear of the top of the shank leg is a single knob for anchoring the snood. Above the knob the shank is whittled to a point. The cord of attachment seems to have been made of two twisted strands of long coarse fibers apparently seized with a small cord of finer materials. The coarse inner cord is broken up into its factors and these are looped beneath the shoulder. The investing cord is also looped beneath the shoulder and around the point of the shank, the raphe being on the inner or front side. The barb is beautifully formed, keen-pointed and highly polished, is set by a simple scarf joint on the inside of the barb leg, and secured by two lashings of flat braided sennit. The upper lashing is composed of six turns, the lower of eight. This hook is remarkable in that it has a long base which forms the upper part of the barb leg of the hook, instead of having the bend of the barb set practically flush with the top of the barb leg as in all other hooks thus far studied. This elongated base to the barb is certainly a unique structure in *Ruvettus* hooks.

*Austral Group.* Lying southeast of the Cook or Hervey Group are the Austral Islands, of which group Tubuai is possibly the best known island. In the collections of the Bishop Museum are two wooden fish hooks from this island used in deep sea fishing for the *Uraena*. Measurements for these hooks are as follows: extreme length of shank leg, 11.75 and 12.5 inches; of barb leg, 10 and 10.13 inches; outside width of hooks, 3.9 and 3.6. These hooks, in general shape and size and in method of attaching barbs and lines, are practically duplicates. The only essential difference is in the slant of the barbs. The shorter has the barb set on the front side of the barb leg, at an angle but slightly below the horizontal, while the longer has it set at an angle of about  $45^\circ$  from the horizontal. Both are typical *Ruvettus* hooks and definitely indicate that the *Uraena* is the same fish as the *Palu* of the Ellice Group. Thus, there is added to our list another Pacific archipelago where the presence of the characteristic *Ruvettus* hook definitely points to the fact that this fish, heretofore unreported for this group, is found here. The smaller of the two hooks is reproduced as Fig. 48.

*Paumotus.* Passing by the Society Islands, whose *Ruvettus* hooks will be treated in a special sub-section, we take a far leap to the Paumotus, Taumotus, or Low Archipelago. Here again there are no published accounts of distinctive *Ruvettus* hooks, but Seurat's combination *Ruvettus*-shark hook must not be forgotten (See p. 247, Fig. 30), nor the fact that he expressly says that *Ruvettus* is taken at Fagatau, one of this group, with the hook which he figures and describes. I am therefore privileged to publish for the first time a figure of a real *Ruvettus* hook from the Paumotus, since in the photograph of hooks from the Bishop Museum is one from Kakahina in that group. It comes labelled "shark" hook, but as Fig. 49 shows, it is an undoubted *Ruvettus* hook. Its measurements are: shank leg, 8.4 inches; barb leg, 7.1; greatest inside width, 3.75 inches. This hook is

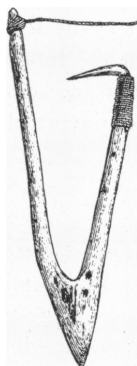


Fig. 48



Fig. 49

Fig. 48. A Wooden Hook (10.75 inches long) used for taking *Uraena* in the Austral Isles. From a photograph by courtesy of Bishop Museum.

Fig. 49. An 8.4-inch *Ruvettus* Hook from Kakahina in the Paumotu Archipelago. From a photograph by courtesy of Bishop Museum.

nicely finished and the legs and base of the round-bottomed V are neatly rounded off. The rather blunt wooden barb, which points towards the shank in a plane about  $25^{\circ}$  above the horizontal, is neatly lashed on with many turns of sennit in at least two layers. The barb is set on the left side of the top of the barb leg by a simple scarf joint, but to hold it tighter, a layer of tapa is inserted between barb leg and barb. (Information from Doctor Ball.) The shank leg ends in a knob on the rear terminal part. The line of attachment, which is composed of two strands of twisted sennit, is securely lashed to the top of the shank by many turns (apparently in two layers) of a fine sennit cord, the upper end of which is used to seize the lower part of the snood. This attachment, it may be noted, is on the inner side of the leg. This is a well-made *Ruvettus* hook, and taken in connection with Seurat's figure and statement, definitely settles the matter of the occurrence of *Ruvettus* and its capture in the Paumotus.

*The J. L. Young Collection in the Bishop Museum, Honolulu.* In the Bishop Museum, there are eight *Ruvettus* hooks, collected by Mr. J. L. Young from undesignated localities in the South Seas. However, careful study of pencil sketches, kindly sent by Doctor Ball, has convinced me that they are all Polynesian hooks. All of them are small, two markedly so—the smallest *Ruvettus* hooks yet found or described. These six hooks are noticeably alike and, possibly disregarding the first because of the material of which it is composed, they probably came from the same locality, and they may have been the work of one maker or of one family. Their measurements in inches are given in the following table.

The J. L. Young Collection of Hooks in the Bishop Museum, Honolulu

Number	1	2	3	4	5	6	7	8
Long leg	2.5	3	4	4.2	4.5	4.6	5.25	5.3
Short leg	2.0	2.4	3.75	3.6	4.2	4.2	4.6	4.9
Width (outside)	1.0	1.1	1.7	1.6	2	2.5	2.2	3.75
Space point barb to shank	0.3	0.5	0.38	0.57	0.63	1.3	0.56	1.3

Museum Numbers B3535 B3538 B3534b B3533d B3533c B3533b B3534a B3533a

The first of these hooks, the smallest *Ruvettus* hook on record, is 2.5 inches over the shank leg compared with the 17.75 inch specimen from the Caroline Mortlock Islands, (Fig. 73). This hook (Fig. 50) is made of solid black tortoise shell. Note the knob below which the cord of attachment made of ordinary sennit is made fast. This and the pearl shell hook from Tahiti (p. 273) are the only known *Ruvettus* hooks made of material other than wood, although barbs made of other material are occasionally

found. This hook, in its general outlines, its V-shape, its knob for the attachment of the line, and its inwardly on-the-level pointing barb, is certainly a *Ruvettus* hook. However, if used for taking this fish, then young and small ones must have been caught on it. Perhaps it was made more for an ornament than for use. Unfortunately, its locality is unknown.



Fig. 50

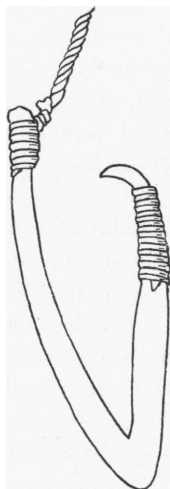


Fig. 51

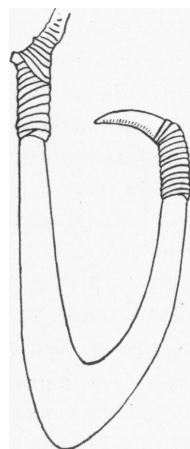


Fig. 52

Fig. 50. The Smallest *Ruvettus* Hook (2.5 inches long) on Record, made of Solid Black Tortoise Shell. Locality Unknown. Sketch by courtesy of the Bishop Museum.

Fig. 51. The Second Smallest *Ruvettus* Hook Known (3 inches long). Body of Wood, Barb of Stalactite. Locality Unknown. Sketch by courtesy of the Bishop Museum.

Fig. 52. A 5.25-inch Shell-Tipped Hook. Locality Unknown. Sketch by courtesy of the Bishop Museum.

In size the other seven hooks form a beautifully graded series; they are all small, of V-shaped forks of wood, and have the cord of attachment fastened on the inside of the top of the shank leg in the same general way. All have minor variations, especially in the material used for the barb, but all are plainly *Ruvettus* hooks. For none have we any data as to the place of origin.

The smallest of the seven (3 inches long) is remarkable in that its barb is made of a sharp talon-like fragment of stalactite lashed on the right side of the top of the barb leg with a cotton cord. This same cotton cord is used to secure the sennit cord of attachment to the top

of the shank leg below a slight knob which projects backwardly. Doctor Ball thinks that this is a modern hook, a thing that the cotton cord surely suggests. This interesting hook is shown in Fig. 51. The island of its origin is also unfortunately unknown.

Hook No. 3 of the table is a more typical *Ruwettus* hook than either of the preceding in that its barb is more normal in shape though it is made of shell. It is slightly spiralled to the left of the shank. No. 7 also has a shell barb, but it points squarely at the center of the shank. The lashings of sennit so completely cover the bases of the barbs that the sketches cannot indicate to what part of the tip of the barb leg these barbs are attached. Hook No. 7 is portrayed herein as Fig. 52, to show its interesting barb. Doctor Ball's sketch shows that the shell barb of hook No. 3 points about horizontally toward the shank leg.

Hooks Nos. 4, 5, 6, and 8 all have short sharp-pointed fowlspur-like wooden barbs lashed on with sennit so thoroughly that one cannot determine their mode of attachment from the sketches. No. 4, has its barb slightly spiralled to the left; No. 5 markedly so; No. 6 points squarely at the shank; while No. 8 is most spiralled (to the left) of all. Since Doctor Ball was good enough to lay each of these hooks down on a piece of paper and trace its outline, it is possible to measure approximately the width of the opening between the point of the barb and the shank. These data will be found in the table (p. 270). Omitting Nos. 1 and 2, the remaining hooks may be arranged on this basis in the following order, beginning with the smallest opening: No. 3, 0.38 inch; No. 7, 0.56 inch; No. 4, 0.57 inch; No. 5, 0.63 inch; No. 6, 1.3 inch; No. 8, 1.3 inch.

As has been indicated, all of these hooks (except the first two which have already been described) are markedly alike except in the shape and material of the barbs (two having shell barbs). They are made of wood, have barb and shank legs of approximately the same length, and the lashings of barbs and snoods are very similar. The hooks with shell barbs have been figured and described. The other four are very similar in all respects, but differ in that all have rather short claw-like wooden barbs, pointing nearly horizontally toward the shank legs and separated therefrom by a considerable opening. Fig. 52 is a fair representative of the lot save that its barb is of shell. It hardly seems necessary to figure any of these other four, particularly as I am unable even to suggest their islands of origin.

*High Islands.* The hooks thus far considered all came from low-lying coral atolls, most of which are not more than fifteen or twenty feet above sea level and the highest (as Mangaia in the Hervey Group), upraised atolls of not more than three hundred feet elevation. In this

sub-section, however, consideration will be given to hooks from high volcanic islands. The reason for this segregation of data will now be made clear.

In my other article on the Palu, Louis Becke (who knew most about the fish) and others, were quoted to the effect that *Ruvettus*, being a deep-sea fish and caught only at depths of from eighty to three hundred fathoms, is found only off low-lying steep-sided coral atolls, where the

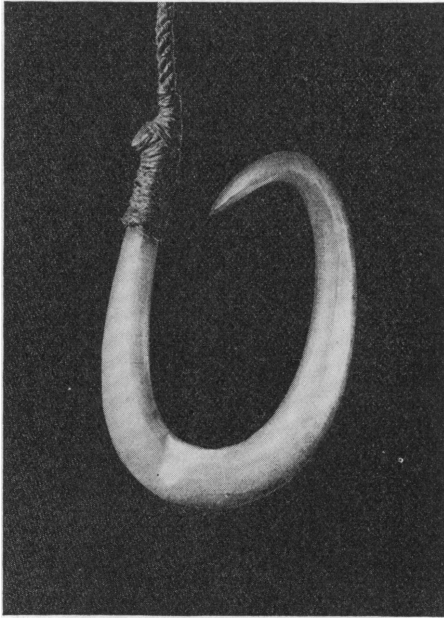


Fig. 53. A Pearl Shell *Ruvettus* Hook from Tahiti (2.75 inches long). Courtesy of the Peabody Museum, Salem, Mass.

submarine slopes will in a few hundred yards or, at most, a few miles, fall off to abyssal depths. However, there seems no real reason why, with its wide distribution, which will be fully emphasized in a later section, *Ruvettus* should not also be found around high islands with gentle submarine slopes.

That this is presumably true of Tahiti and the Society Islands generally may be seen by reference to the hooks of *Ruvettus* type shown in Figs. 27, 28, and 29—the last being a true *Ruvettus* hook in everything but its wide U-bend and great size (about 14 inches). All these hooks

may have been used for taking a large form of *Rivettus*, as well as sharks. Furthermore, among the hooks sent me by Curator Jenkins, of the Peabody Museum, Salem, is the specimen shown herein as Fig. 53. This hook, the most beautiful I have ever seen, is carved solidly out of a pearl oyster shell.

Not merely its general shape, but two specific points declare it an undoubted *Rivettus* hook. One is the barb, about which there can be no doubt. The other is the knob on the back side of the top of the shank leg. To and below this, the line is securely looped and seized. This line is 14.5 inches long, made of three strands of very hard twisted sennit, and ends above in a single knob. Due to the shape of the shell out of which it is cut, the barb leg has a decided spiral, but at the top it returns on itself so that the barb points squarely at the shank. The shank leg is 2.75 inches long, the barb leg a fraction less. The barb is 0.62 inches long (inside measurement) and approaches so closely to the shank leg as to leave an opening of only 0.25 inch.

At a time when this paper was almost finished, my attention was called to a plate in Parkinson's account of the Voyage of the "Endeavour"<sup>1</sup> (1773) which is largely given to portraying fish hooks

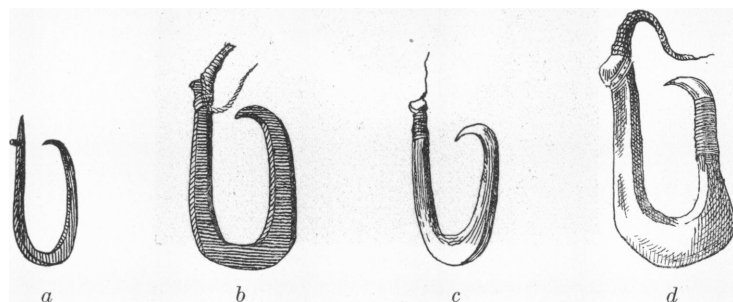


Fig. 54a-c. Three Pearl Shell Hooks from Tahiti, measuring 1.5 inches, 3.75 inches, and 2 inches long, respectively; d, A Wooden Hook (3.75 inches long) with Pearl Shell Barb, collected at Tahiti in 1764 on Cook's First Voyage. After Parkinson, 1773, pl. XIII.

from Tahiti and the neighboring islands. Here I found figures of three pearl shell hooks of the same type as the preceding and forming a pretty well developed series leading to the form shown in Fig. 53. These three hooks are shown in Fig. 54a, b and c. Note how closely the third approaches the hook shown in Fig. 53. Here we have a gradation in Tahitian pearl shell

<sup>1</sup>Parkinson, Sydney, 1773, pl. XIII.

hooks ending in a true *Ruvettus* hook. Furthermore, on the same plate is found the figure of a shell-tipped wooden hook from Tahiti (Fig. 54d) which despite its small size (3.75 inches long) cannot be designated as anything other than a *Ruvettus* hook. It and the hook in Fig. 54c show pretty conclusively that the "oilfish" was taken at Tahiti prior to 1769, the date of Cook's first visit.

Another undoubted *Ruvettus* hook from the Society Islands (specific locality unknown) is the dainty little specimen shown in Fig. 55. This was collected by W. H. Phillips in 1898 and was loaned by the United States National Museum. It measures 5.25 inches over the long leg; over the barb leg, 4.75 inches; its greatest width is 1.4 inch. The pygmy barb, shaped like a bird's claw, measures 0.9 inch on the outside, 0.6 inch on the inside, and terminates 0.75 inch from the shank leg. Slightly spiralled to the left, the point of the barb lies in a plane which just clears the shank. The barb is set by a scarf joint on the left of the barb leg to which it is secured by thirteen turns of a flat braid of sennit made up of three strands of straight fiber. The loose ends of the braid are both skilfully hidden under the turns.

The line of attachment is rather unusual. It is 4.5 inches long, is made up of a flat band of sennit 0.25 inch wide and 0.12 inch thick plaited out of three strands of untwisted sennit. This snood is in the form of a bight or loop, the free ends are laid on either side of the top of the shank and secured below the knob on its rear by fifteen turns of a very modern looking cotton fishline. The line of attachment is closely seized with this same cotton cord for a distance of 1.9 inch above the top of the shank. Above this the flat braid of sennit forms an open loop.

This dainty hook is, despite its small barb, an undoubted *Ruvettus* hook, as are those shown in Fig. 54 a-d. These facts all argue conclusively that the Palu, *Ruvettus*, is found off these high islands—as indeed one might expect. Furthermore, there will now be set forth other evidence, less conclusive, but, at any rate, more or less corroboratory, that this fish is taken off other high islands.

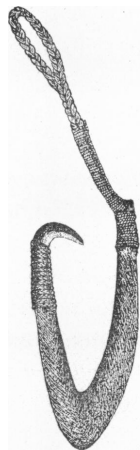


Fig. 55. A *Ruvettus* Hook (5.25 inches long) from the Society Islands. The bird-claw-like barb is the smallest known. Courtesy of United States National Museum.

## Krämer says that Palu

were alleged to be caught with a 'feather hook' [trolling hook] on the outer reef at Apia (Samoa) in the early morning.<sup>1</sup>

However, the context shows that he had little confidence in the report and that he merely quotes it for what it is worth. On this point Demandt, whose work on fish and fishing in Samoa is the latest (1913), most extensive and most authoritative, lists the Palu as a Samoan fish, but identifies it as *Aphareus furcatus*, one of the Lutjanidæ.<sup>2</sup> He adds that it is caught on the outer reef at night with a "spinner" or trolling hook. This is doubtless the same fish and same method of fishing as that referred to by Krämer.

Nevertheless, Krämer says that it was reported to him that the Palu was also taken at Manu'a, the easternmost of the Samoan Group, where deep water is found close off shore. He was unable to verify this, but it is fair to say that it seems entirely probable. Indeed, Krämer figures a wooden hook which in everything but its abbreviated barb is a wide V-shaped *Ruwettus* hook.<sup>3</sup> This hook is so small and so poorly shown in his half-tone cut that it will not be reproduced here. However, further on, similar hooks will be figured and Krämer's hook will be referred to as entirely similar to them (p. 299).

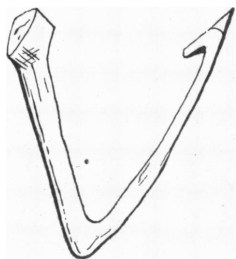


Fig. 56. A Wooden Hook used for taking Large Fishes in the Samoan Islands. After Demandt, 1913, fig. 6.

Furthermore, Krämer, in referring to this hook<sup>4</sup> says that it is used for taking large fishes and in a footnote to this very sentence he refers to his paper in *Globus* (1901) to which the attention of the reader has already been called in connection with Fig. 35. And finally, Krämer lists the Palu among Samoan fishes,<sup>5</sup> saying that it is reported from Manu'a, and again refers to his earlier article. It is plain that Krämer believed this report and that the fish referred to was *Ruwettus*, as indeed he had every reason to do. Hooks like the one figured by

Krämer, but from other islands will be shown. However, Demandt figures just such a hook<sup>6</sup> from Samoa and this is reproduced herein as Fig. 56. If the sides of this hook were more nearly parallel and it was provided with a longer barb, it would be an undoubted *Ruwettus* hook.

These accounts from Krämer and Demandt, taken in connection

<sup>1</sup>Krämer, 1903, vol. II, 420.

<sup>2</sup>Demandt, 1913, 121.

<sup>3</sup>Krämer, 1903, 170.

<sup>4</sup>Krämer, 1903, 194.

<sup>5</sup>Krämer, 1903, 420.

<sup>6</sup>Demandt, 1913, 121.

with the illustrations of the hooks used, confirm one in the preconceived belief that the purgative fish is taken in the Samoan Islands.

The explanation of the finding of so few records of *Ruvettus* fish or *Ruvettus* hooks from high islands is probably to be found in the fact that their low submarine gradients would force the fisherman to go twenty to twenty-five miles out to sea before he would find water sufficiently deep to catch the fish. And since he finds plenty of edible fishes in the shallower waters nearer inshore, he prefers to catch these rather than suffer the exposure and run the risks incident to fishing offshore at the distances named—danger of being caught in squalls or storms and carried away to other islands or lost entirely. The atoll fisherman, on the other hand, finds water deep enough for *Ruvettus* a few hundred yards off the reef.

*New Zealand.* One *Ruvettus* hook from New Zealand is known to me, and is figured by Edge-Partington from the original in the British Museum<sup>1</sup>. This hook, which is 4 inches long, is labelled as coming from New Zealand, and is reproduced herein as Fig. 57. Its legs are roughly parallel and strengthened at the base with a lashing of five turns on the shank leg and four on the barb leg, and to prevent the lashing from slipping it is let into notches cut on the outside of each leg, the deeper notch being on the barb leg. It should be noticed that the base ends in a blunt point. The barb leg, which is nearly as long as the other leg, terminates in a bone barb pointing squarely to the shank and lashed on in an apparently simple fashion. This claw-like barb is very like those shown in Figs. 51 and 55. The shank leg of this hook has only one knob at the tip, below which the line is looped, and terminates in a point inclined slightly toward the barb leg. The lashing of the line to the shank is as primitive as that of the barb to the barb leg.

It is interesting to compare the lashing at the base with that found on the Tongan hook shown in Fig. 44. In both cases the object is to strengthen a weak base. In the first, the hook is weakened by a chip taken out of the base by a slip of the knife; in the second case, however, the hook is a weak one because of the long slender limbs, so that the fish pulling on the barb and the fisherman on the line would tend to tear the hook in two at the bend. The Tongan hook is only 0.5 inch longer than the New Zealand hook, but it is much sturdier in its make up. In its general structure, but especially in the form of its barb, this New Zealand hook recalls the Tokelau hook shown in Fig. 42.<sup>2</sup>

<sup>1</sup>Edge-Partington, vol. I, pl. 391, fig. 8.

<sup>2</sup>For a recent discussion of fishing technique in the New Zealand area, see Skinner, 1923 (80-83). According to this author, both simple and composite hooks were used and the materials for their construction were whale bone, whale ivory, and wood. Then, in discussing evidence for and against the relative chronology of nets and hooks he quotes from an informant who stated "that the Morioris twisted and looped the young sprigs of some of the native trees in order that they might grow into the right shape for hooks" (81).

It should be specifically noted that this hook is labelled as coming from New Zealand (locality not designated, but probably from the northern part), thus establishing the most southern record for the hook. There is nothing strange in finding such a *Ruwettus* hook there, since it is well known that the Maori are a Polynesian people. However, as will be shown later, there is ground for grave doubt as to the correctness of this label. Nowhere, among all the hooks and figures of hooks from New Zealand, is there record of such a hook. I know of no reason why *Ruwettus* hooks should not be found in New Zealand, but this one is markedly like others definitely known from Niue. It will be discussed from this point of view in the sub-section on hooks from Niue. However, we cannot go behind the returns, since this would require stronger evidence than is at hand. To the ichthyologist this hook is of great interest, since, if authentic, it indicates the presence in New Zealand waters of our fish—the most southerly occurrence in any waters.

*Hooks with Floats from Niue.* All the hooks thus far studied have, so far as the evidence shows, been used in the ordinary conventional fashion—baited and sunk to the bottom eighty to three hundred fathoms down. But being wooden hooks, it may be doubted if the weight of the bait would sink them. On this point Becke<sup>1</sup> tells us that a lump of coral is attached by a fine cord to sink the hook and when the fish is hooked its struggles cause the sinker to break the fine cord and become detached, decreasing the weight to be brought to the surface. However, the question will at once be asked by everyone who has ever fished on a coral bottom—"What is to prevent the hook from becoming fouled?" In answer to this question there is now to be described a most ingenious device intended to prevent this very thing.

This device was first figured by Edge-Partington<sup>2</sup> in 1890 in his "Album" (Fig. 58). This apparatus is from Niue (Savage Island), a solitary upheaved coral island east of the Tongan group. Edge-Partington labels it "Fish hook and float used in kite fishing." This is evidently an error. It happens that for eight years I have been collecting data on unusual methods of fishing in the South Seas with particular attention to kite fishing. So far as the data at hand go, kite fishing is not practised at Niue; indeed, it could not be carried on with such an apparatus as that portrayed in the figure. On the other hand, we have positive statements from Becke<sup>3</sup> and Mrs. David<sup>4</sup> that Palu fishing is carried on at Niue.

<sup>1</sup>Becke, 1901, 157.

<sup>2</sup>Edge-Partington, 1890, vol. I, pl. 67, fig. 6.

<sup>3</sup>In Waite, 1897, 201.

<sup>4</sup>David, 1899, 250.

This hook, as may be seen from Fig. 58, is plainly a small *Ruvettus* hook (4.5 inches long) and the 8 inch stick is as plainly a submarine float.

The base of the hook figured by Edge-Partington, which is very narrow and has nearly straight parallel legs almost equal in length, is left very much thicker proportionally than is usual, and ends in a peculiar point. Like the hook from New Zealand (Fig. 57), it is made from a narrow fork. The pointed base is a unique structure and the extra thickness is probably left to make it so strong that the hook may not

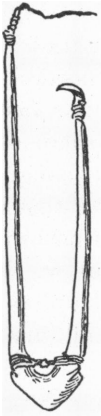


Fig. 57

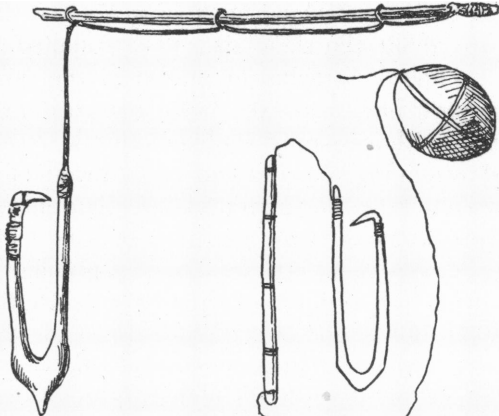


Fig. 58

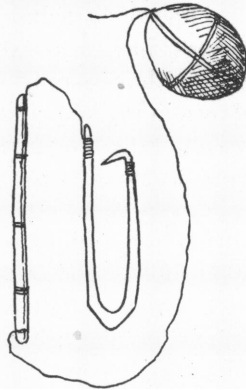


Fig. 59

Fig. 57. Wooden Palu Hook from New Zealand with a Bone Barb and a Strengthening Lashing at the Base. In British Museum Collections. After Edge-Partington, vol. I, pl. 391, fig. 8.

Fig. 58. A *Ruvettus* Hook (4.5 inches long) and Float (8 inches long) from Niue (Savage Island). After Edge-Partington, vol. I, pl. 67, fig. 6.

Fig. 59. A Wooden *Ruvettus* Hook with Wooden Float and Stone Sinker figured with Objects from Niue, but "labelled New Guinea." After Edge-Partington, vol. II, pl. 39, fig. 4.

have its two legs torn asunder by the struggling fish. The barb leg ends in a bird-claw-like barb of unspecified material pointing squarely towards the shank. How it is lashed fast is not clear, but it is apparently on the right side. Neither is the method of lashing the cord of attachment to the shank leg clear. This cord is looped three times by half hitches to the wooden stick or float, to the right hind end of which the fisherman's line was presumably attached. The hook itself is small for a Palu hook (4.5 inches over all), but not exceptionally so, since the American Museum

collection contains smaller ones and the pearl shell hooks from Tahiti are also smaller. However, none of ours has the legs so nearly parallel as has this hook.

When it is understood that a sinker is used to bring the apparatus to the bottom, it is easy to see that the float is plainly intended to lift the hook and its attached bait clear above the coral fragments, and so to prevent its being caught among these, thus rendering the fishing futile and probably causing the loss of the hook fabricated with much labor.

Just here attention should be called to the marked similarity between the New Zealand hook (Fig. 57) and that from Niue (Fig. 58). Both are about the same size, have rounded bases and parallel legs, have the line of attachment affixed in the same general fashion, and finally, both have claw-like barbs attached in not dissimilar fashion. Personally, I have strong doubts as to the New Zealand origin of the hook shown in Fig. 57. If it had a float I would unhesitatingly assign it to Niue despite Edge-Partington's label. The only thing about it that has a New Zealand flavor to me is its barb of bone—a material for barbs much used in New Zealand but by no means peculiar to that country. However, all the other objects figured by Edge-Partington on the plate with this hook are of undoubted New Zealand origin. For all this, the similarity of the two hooks is extremely marked.

Entirely similar to these undoubted hooks and floats from Niue, is a hook, float, and sinker in the Reading Museum figured by Edge-Partington (Fig. 59). This hook is figured among other objects from Niue, and its legend reads "Wooden fishhook with sinker of stone and float. [Labelled New Guinea]." The brackets indicate that Edge-Partington was in doubt as to the correctness of the label and so am I. No measurements are given for this hook, but it may be safely conjectured that it is small.

Very noticeable is its extreme narrow U-shape, also its almost horizontally pointing barb (compare with Figs. 57 and 58). Note the pointed base and the method of attaching the line. In these matters this hook looks like a Niue product. Now hooks with floats, as will be seen later (p. 307 *et seq.*), are found in the nearby islands lying to the east of New Guinea, but, as may be seen in Fig. 78 these hooks are huge in size and are very markedly different in their make-up, general outline (sharp V-shape), shape of barb, etc., from that under consideration. All these things lead me to believe that the hook shown in Fig. 59 is surely not from New Guinea.

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<sup>1</sup>Edge-Partington, 1890, vol. 2, pl. 39, fig. 4.

Here the sinker, held by four cords crossing by twos at right angles, is attached to the fisherman's line, next comes the float to which the line is lashed fast by four circumferential seizings (not half-hitches), and last comes the hook. This hook is more like that shown in Fig. 57 from New Zealand than like the first Niue hook. However, it has the parallel legs, an almost horizontally placed barb, and the simple attachment of both barb and line. The base, pared down into angular form, recalls the New Zealand hook. However, there seems to be no reason to doubt that it is actually a hook from Savage Island. Certainly it never came from New Guinea.

In 1899, Etheridge published figures and descriptions of a model of a Palu fishing apparatus collected at Niue by Becke, and which, after passing through several hands, finally came into the collections of the Australian Museum. Etheridge's description is not clear, but his figure (my Fig. 60) helps materially. As best I can make out, at the end of the coconut fiber fishing line is attached a smaller line having at its end a sinker made of coral ground into a rough pear shape and held in a meshwork of cords. Between the sinker and the fishing line, there are attached two hooks and their floats in the fashion already made clear. However, the cord of attachment from the hook to the line is looped three times to the float by half hitches as is Edge-Partington's. The functions of sinker and float are made clear in Fig. 60 which is a reproduction of Etheridge's figure somewhat modified to show how the apparatus is used. These hooks are markedly like Edge-Partington's especially in the shape of the base, the remnant of the basal stem of wood remaining as a blunt point. The method of attaching the cord to the top of the shank is very much alike in both hooks. However, both of Ethe-

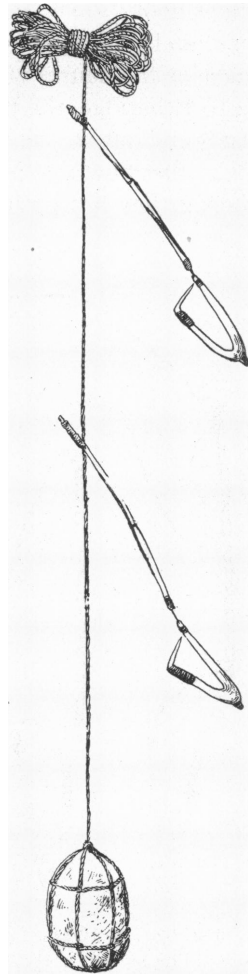


Fig. 60. A "Gang" of Palu Hooks from Niue, composed of Hooks, Floats, Sinker and Bundle of Line. Slightly modified from the original drawing by Etheridge, 1899.

ridge's hooks are V rather than narrow U-shaped as in Edge-Partington's, and the barbs are also unlike—here of normal *Ruvettus* type. A glance at the figures will make further description unnecessary. According to Etheridge, the floats are so attached to the line that one hook and float stand out on one side of the line, while the other is on the opposite side. Just how this is brought about is not clear. For convenience in printing they are both here drawn on the same side of the line.

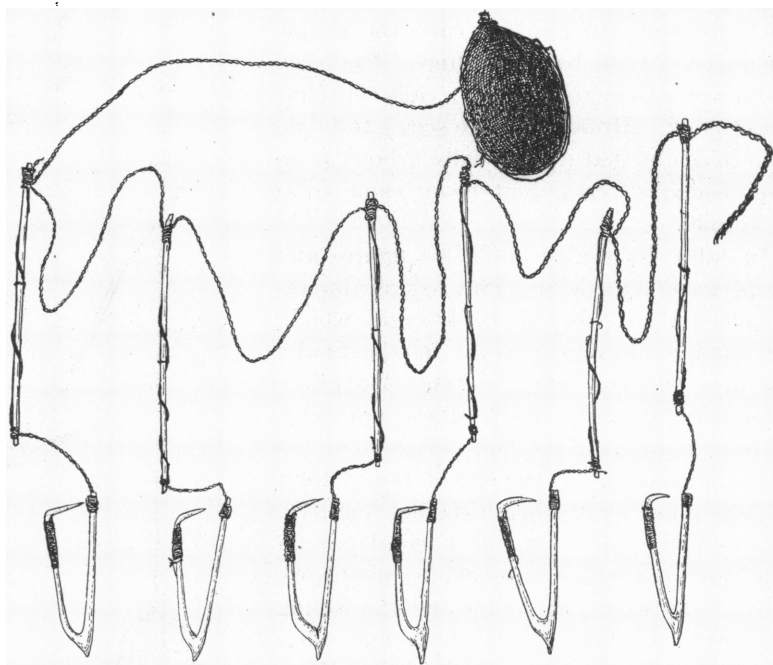


Fig. 61. A "Gang" of Six Small *Ruvettus* Hooks, with Floats and Sinker, from Niue. The sinker is at the bottom and the fisherman's line is attached at the top. Sketched from a photograph by courtesy of the Bishop Museum.

Why Etheridge calls this apparatus a "model" is not clear. Presumably both hooks and floats are small, but it is unfortunate that no dimensions are given since these would have helped decide the matter. Edge-Partington's hook is also small—4.5 inches over the shank leg, with an 8 inch float.

Among the South Sea wooden hooks in the Bishop Museum is a large "gang" of "Oilfish" hooks from Niue. These Curator Ball has had photographed for me and from the photograph a drawing has been

made (Fig. 61). This whole apparatus Doctor Ball designates as a "model" because the hooks are small and because the whole thing was specially made for Doctor E. M. Loeb when he was at Savage Island in 1924. Doctor Ball further says that the natives of Niue are now very much given to making models of native implements and weapons for the tourist trade. This, however, would hardly apply to Etheridge's hook or to Edge-Partington's.

These hooks are all small. Two of them measure as follows: 4 and 4.8 inches over the shank leg; 4 and 4.75 inches over the barb leg; greatest outside width, 1.4 and 1.7 inches. As the figure shows, they are all practically the same size. The base of each hook is made in the same fashion and is practically identical with that of the other Niue hooks figured by Etheridge and with Edge-Partington's hook (Fig. 58). Each hook is a narrow V, two having the sides nearly parallel. The barbs are more nearly like those on Etheridge's hook than that of Edge-Partington's. Each hook has a fairly long snood attached to the outer end of the float, wound round this two or three times, and fastened in the middle—whether by a half-hitch as in the other Niue hooks or by a separate lashing cannot be determined from the photograph. The outer end of each float is attached directly to the fishing line, and at its bottom end and five feet distant from the lowest hook is the sinker held in a meshwork of bast fiber.

All these Savage Island hooks are markedly alike in general form, in position and attachment of float and sinker, and particularly in the shape of the base of the hook. One may conjecture that either all Niue hooks have the same kind of base, or that these hooks came from a single village, or possibly were all made by the same man.

*Alleged Ellice Islands Hook with Float.* In addition to the hooks with floats from Niue, a similar hook alleged to be of Polynesian origin has come to my attention. In response to a request for rough sketches and notes concerning any hooks in his possession, Mr. Oldman sent a sketch of a hook with a float, reputed to be from the Ellice Group, and since no such hook and float had ever been described before from there, this was purchased. When it came it was at once recognized as a Melanesian hook. I then wrote Mr. Oldman, who had sold us the hook in good faith, hoping to get the history of the hook and its possible eastward journey to the Ellice Islands. In answer he wrote:—

I purchased it from a dealer in the west of England, and he told me that he had bought it from a missionary who had been to the Ellice Islands and had brought the

hook from there. I wrote to the dealer asking if he could give me the address of the late owner, but he cannot as it was seven years ago.

As suggested above, the hook may have been carried eastward by progressive stages from Melanesia to the Ellice Group, but this cannot be proven. This hook will be described among the other Melanesian forms.

## ABNORMAL POLYNESIAN-MICRONESIAN *RUVETTUS* HOOKS

Several hooks, which, while undoubted *Ruvettus* hooks to my mind, are so unusual in material and shape that it seems best to consider them apart from the more normal hooks.

### V-SHAPED TYPE

*Tahiti.* The first of these is a finely finished hook from Tahiti (Fig. 62). It is in the South Sea collections of the Philadelphia Commercial Museum and was courteously loaned me by Director Wilson and Curator Toothaker. It was obtained in Paris and its French label calls it a wooden shark hook with coir line from Tahiti. It is made of a fork of very fine-grained hard wood and has a bone barb. Measured in straight lines, the shank leg is 10.25 inches long, and 2.75 inches in circumference, the barb leg 8.5 inches long. The limbs are flattened ellipses in cross-section, and the base, which is 2 inches deep and 5 inches in circumference, is trimmed to a fine knife edge or keel below. The shank leg terminates in a point, but on the outer back side has a knob for securing the line which is firmly whipped fast by many turns of fine sennit. The line is composed of two strands of finely twisted sennit. The lunate bone tip is also secured by many turns of sennit lashings at the left side of the top of the barb leg. The barb points upward instead of downward as in a typical *Ruvettus* hook. It is made of bone, presumably out of the rib of a pig, and is cut out of the end of the rib to get as much curve as possible. This is a large, strong, and well made hook. While more abnormal in the setting of the barb than any hook thus far studied, it is plainly a *Ruvettus* hook.

*Gilbert Group.* Belonging to the same general type of *Ruvettus* hook, but differing in the form of barb is an interesting hook from the Gilbert Group now in the collections of the Bishop Museum. This is a wooden hook also made from a fork, the bone barb, however, differs in shape and setting from that on the Tahitian hook. The shank leg of this hook, (Fig. 63), measures 14.4 inches; the barb leg (measured in a straight line from tip of barb to point

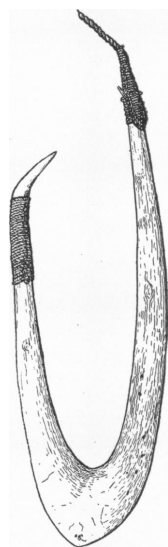


Fig. 62. A Wooden *Ruvettus* Hook from Tahiti with an Upward Pointing Barb. Courtesy of Commercial Museum, Philadelphia.

of base), 11.1 inches; and the greatest outside width is 6.5 inches. The wooden part is distinctly of the *Ruwettus* type, not so, however, the bone barb; but, if this barb were set at an angle below the horizontal equal to that now above it, we would have a good Palu hook. This hook is

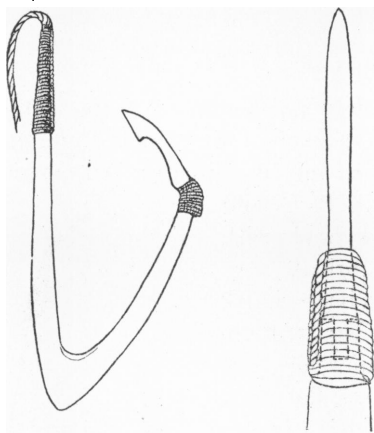


Fig. 63. A Wooden Hook (14.4 inches long) from the Gilbert Islands (?). The second figure shows how the bone barb is affixed. Courtesy of Bishop Museum, Honolulu.

labelled "Gilbert" Islands but Doctor Ball queries its correctness, and so do I. The barb is distinctly of the New Zealand type and its manner of fixation—by a "tongue" set in a "groove"—is exactly identical with that found in the New Zealand shark hook (Fig. 21). To my mind the probabilities are that this is a hook from that southern island, but in the absence of definite information, it will be retained among the "Eccentric" hooks, as coming from the Gilberts.

#### U-SHAPED TYPE

*Bowditch Island, Tokelau or Union Group.* Two eccentric *Ruwettus* hooks of the round bottom type have been loaned by the United

States National Museum. One is labelled as coming from the Kingsmill or Gilbert Group, the other from Tahiti. However, careful study has convinced me that they come from Bowditch Island. The smaller of these hooks (U. S. N. M. No. 3682) is labelled as coming from the Kingsmill Group in Micronesia and was collected by the Wilkes Expedition in 1841. This hook (Fig. 64) has the shank leg measuring about 5.75 inches, the barb leg 6.1 inches, greatest width between legs 2.8 inches. The barb measures 2.2 inches outside and 1.9 inches on the inside and the clearance between its point and the shank is 1.2 inches. Both hook and barb are made of some dark hard wood. The shank leg and the base of the hook seem to have been the main stem of a root which extended on to the right but was cut off where the barb leg grew off. The barb leg seems to be formed of a branch which grew off almost at right angles to the bend at the bottom but almost in the same plane with and parallel to the shank leg. This barb leg has naturally a decided spiral to the right. Attention should be called to the sharply downward pointing *Ruwettus* barb and to the fact that here again we have a hook with the barb leg longer than the shank.

By careful manipulation the barb was removed and was found to have its hinder surface cut in the form of a V (in cross-section). This fits into a V-shaped slot in the outer or front surface of the top of the barb leg, just as was found in the hook from Bowditch Island shown in Figs. 37 and 38. The barb is secured by about fifteen loosely wound turns of a flat braided three-strand sennit. This is then covered on the front and

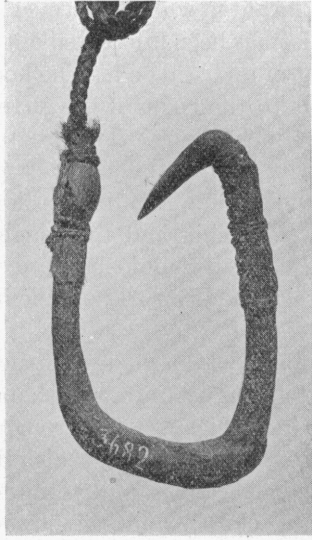


Fig. 64



Fig. 65

Fig. 64. An Eccentric *Ruvettus* Hook said to be from the Kingsmill or Gilbert Group, but herein assigned to Bowditch Island, Tokelau Group. Courtesy of the United States National Museum.

Fig. 65. A Markedly Eccentric *Ruvettus* Hook, said to have come from Tahiti, but herein definitely assigned to Bowditch Island, Tokelau Group. Courtesy of the United States National Museum.

sides by a double layer of coconut leaf sheath, and this, in turn, secured by lashings of the same flat sennit—two turns each at bottom and middle, and three at the top.

The line of attachment is 39 inches long and is about 0.3 inch wide and half as thick save for the upper seven inches where it tapers gradually to about one half that size at about the thirty-sixth inch. It is a flat braid made up of three strands of untwisted fiber. At its lower end its components are looped below the single knob on the rear of the shank leg and

seized fast to the inside of the top of the shank by several turns of sennit. All is in turn covered with "coconut cloth" and this seized with two turns of braided sennit above and two below the knob.

Another eccentric *Ruwettus* hook, and in all ways the most unusual of those herein considered, is from the United States National Museum where it was deposited by the War Department. Its date of collection is not definitely known, though the records note that this was earlier than 1857. There is also some doubt about its locality, which, however, is thought to be Tahiti. This hook (Fig. 65) also has been fabricated out of a root, and apparently the shank is made out of its basal end. The hook has a natural spiral so that the barb stands to the right of the shank. The legs are approximately equal, about 6.4 inches long. The greatest width—5.5 inches—is to be found slantingly across the base of the broad U. The barb is 2.25 inches long outside and 1.25 inches long inside measurement; the opening between the shank and the roughly parallel tip of the barb is 2.1 inches. The barb, it should be noticed, points nearly straight downwards to the base of the U, nearly paralleling the top of the shank leg.

This barb is very like that of the preceding hook, in mode of attachment as well as in general appearance. It too is let into a V-shaped groove on the front or outer side of the barb leg, which groove is roughly triangular in section as is the back side of the root of the barb which fits into it. The form of the inner lashing of the barb cannot be determined since it is carefully covered with "coconut cloth" and this lashed down by five sets of two turns each of a flat three-strand sennit, the free end being carried down on the left side of the top of the barb leg. The barb is certainly securely affixed.

The strong cord of attachment is 27 inches long including the terminal knot at the outer end. It is a flat braid of sennit, 0.5 inch wide in the middle region, and slightly narrower at either end. Its thickness throughout is about 0.25 inch. At its lower end its three strands of untwisted sennit are "unlaid" and securely anchored below the knob at the back of the top of the shank. The loose ends then are seized around the line and the pointed shank—the line being laid on the front or inner side of the shank. The whole is then wrapped in coconut 'cloth' and this fastened in place by two turns of sennit below and four above. The whole is a very strong and apparently efficient fishing apparatus, and the scratches on the base indicate that it has been used—possibly for sharks as well as for *Ruwettus*.

There has been great doubt in my mind as to the place of origin of these hooks. The first and smaller is said to be from the Gilbert or Kingsmill Group, while the second is doubtfully assigned to Tahiti. In Figs. 68 and 69 are portrayed two Gilbert Islands hooks, both of which are totally unlike the hook under consideration. Equally unlike the Tahitian hooks in Figs. 29 and 55, is the second one alleged to come from Tahiti. In my judgment neither hook is from the locality noted on its label. The question then is where did they come from?

My first answer is that they come from the same island. In their general form the two hooks are markedly similar—both are made of roots and but for the sharp bend in the shank leg of the larger hook, they would almost be duplicates. If the smaller hook is laid on the larger so that the barb legs lie in the same vertical plane (and this can be done with absolute coincidence) it will be found that the barbs also lie absolutely in the same vertical plane. The barbs duplicate each other, both in their free ends, and in the ends which are applied to the barb legs as may be seen in Fig. 66c. In both cases the bases of these barbs are cut in a wedge or triangular shape (in cross-section), and fit into V-shaped grooves cut in the outer or front side of each barb leg. Furthermore, these barbs are lashed fast and the lashings covered in a wrapping of “coconut cloth” with the smooth bend in front and the opening behind. This covering is then seized in like fashion with flat braids of three-strand untwisted sennit in each case. Again, each hook has a flat, braided cord of attachment made up of three untwisted (straight) fiber cords. These lines have their unlaid lower ends lashed around and beneath the single crudely carved knob on the back side of the top of the shank leg. In each the tip of the shank above the knob is whittled down to a point. Finally, each lashing is covered with coconut fiber which is seized with turns of an identical flat braid of three-strand untwisted sennit. To sum up, these hooks are practically duplicates, come from the same island, and were made by the same hand unless indeed one is a copy of the other.

Next comes the insistent question—“From what island?” Here the answer is not far to seek. In this same collection of hooks from the United States National Museum is a hook labelled Bowditch Island and previously illustrated in this paper (Fig. 37). Inspection will show that the barbs of all these hooks are shaped alike. They have nearly the same “pitch”, are set in the same V-shaped grooves, are lashed down by an identical three-strand untwisted sennit, which is covered with coconut cloth entire in front but open behind, and this is attached with the same

braided sennit in three sets of lashings of two strands each. This Bowditch hook also has a flat cord of attachment of three braided strands of untwisted sennit,—a cord identical with the others. This also is “unlaid” and secured below the crudely carved knob at the back of the top of the shank leg (in this hook there is a subsidiary small knob just above the larger one). And finally, the whole is covered with coconut cloth, smooth in front but open behind, and lashed at top and bottom by the same kind of sennit. Just here let it be recalled that Lister says that all the large Bowditch hooks have the coconut cloth wrappings over the lashings of both barb and cord of attachment. In short, these two round-bottomed, root-grown, coconut cloth-covered abnormal hooks come from Bowditch Island and not from the Gilberts and Tahiti.

There can be no doubt in the mind of anyone who has carefully followed this research that the Tonga hook next to be figured and described in this section (Fig. 66) is an undoubted *Ruvettus* hook, but he may well be forgiven a doubting attitude with regard to the weird structures shown in Figs. 64 and 65. Made of roots or stems apparently “grown” more or less to order, they are shark hooks in their round, wide U-shaped bases; if they had horizontally pointing barbs they would certainly have been placed among the intermediate forms. But no one who has followed this work with care can make anything but *Ruvettus* barbs out of the shape and setting of their barbs. My judgment is that they were made to take the oilfish, but it is probable that like most large *Ruvettus* hooks they were also used for sharks.

The reader has possibly been wondering what has become of hook No. 6 of the American Museum collection labelled as coming from Tonga, and why it was not studied with the hooks listed in the table on p. 263. There are several reasons for this delay. The first is that while it is an undoubted *Ruvettus* hook, it is so unlike the entirely typical forms from Tonga that it has to be described separately as an eccentric type.

The hook is very small. Its measurements in inches are: length of shank leg, outside 3.0 inches, inside 2.4; barb leg outside, 3 inches, inside 2.1; barb, length outside 1.0 inch., inside 0.7; clearance of barb (tip from shank) 0.12 inches. As the annexed figure (Fig. 66a) shows, it is not made from a simple fork, as are the other Tonga hooks, but from a multiple one. That branch of the fork which would have made the shank leg had on it near the base another or secondary branch which grew so vigorously as to sap the strength of its parent branch and completely usurp its place. Thus the shank leg is formed of a side shoot of the original shank leg branch, while the barb leg is worked out of the larger

or main branch of the two original forks. This hook is not only eccentrically shaped but more crudely finished than the five Tonga hooks referred to. The shank leg still has the bark on it, and has the top unlike the others. It has the lower projection for securing the line, but lacks the upper knob and has the tip cut into a point. This of course means that the line is secured in a manner unlike that in the Tonga hooks.

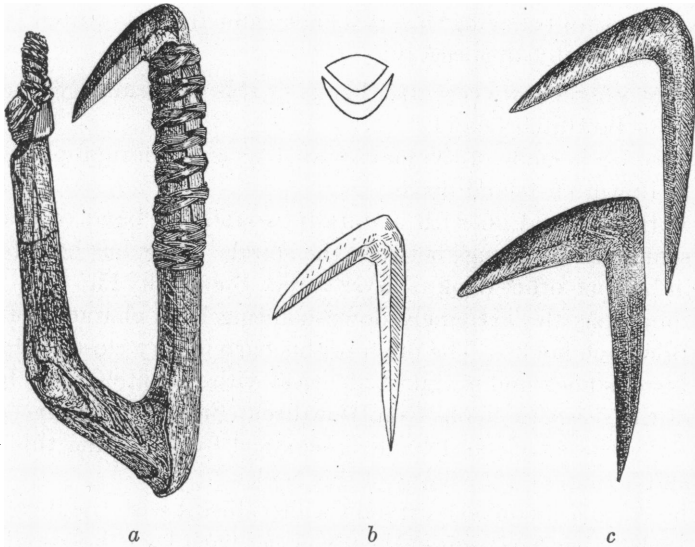


Fig. 66 (S-4344). *a*, An Asymmetrical *Ruwettus* Hook alleged to come from Tonga, but herein assigned to Bowditch Island; *b*, Barb of preceding Hook and Cross-Section showing how this Barb is set in Top of Barb Leg; *c*, Barbs from the reputed Kingsmill and Tahiti Eccentric *Ruwettus* Hooks in the United States National Museum.

The barb leg is straight and extraordinarily long, as long as the shank leg, but instead of being rounded, as in the Tonga hooks, it is roughly polygonal in section. It has the down-pointing sharp barb as do the Tonga hooks, Nos. 43 and 45, while the others have blunt and nearly horizontal barbs. This barb is secured on the point of the barb leg by nine turns of a flat band of plaited sennit. The barbs of the two larger Tonga hooks are also secured by flat bands of plaited sennit closely wound and in part two layers deep, while the three smaller hooks have twisted sennit partly in three layers. However, this eccentric hook has its flat band of sennit wound spirally around with a clear space between each turn over half as wide as the band itself.

This hook bears no evidence that it has ever been used, and it seems not improbable that it was made as a plaything for some child or by some boy as a matter of practice. In any case, the facts set forth above seem to show conclusively that it did not come from Tonga. Then the question is, from what island did it come? The answer has already been suggested when it was placed among the eccentric hooks from Bowditch Island.

The reasons for believing that this hook came from Bowditch Island will now be set forth categorically:—

1. The only other known eccentric hooks of this abnormal type come from Bowditch Island.
2. The barb leg is made of the main branch as is the normal procedure in Bowditch Island hooks.
3. The barb is lashed on with a spirally wound flat band of braided sennit with spacings between the spirals. This has been found in but one other hook—Lister's from Bowditch (Fig. 36).
4. This hook has the extremely down-pointing barb characteristic of Bowditch hooks. The pitch of this barb is very close to that of Lister's hook and is almost identical with the pitch of the barbs of the eccentric hooks from Bowditch (Figs. 64 and 65)—especially the latter, as I have ascertained by detaching this part and laying it on the figure of this hook.
5. This hook has a modified scarf joint which allies it with the Bowditch hooks. The front side of the top of the barb leg is hollowed into a flat U-shaped or round-bottomed V-shaped slot into which slips the shaft of the barb which has been carved to fit, as may be seen in Fig. 66b. No other hook studied in this monograph has such a modified scarf joint save the Bowditch Island hooks.
6. Lastly there has been laid on the inside of the top of the shank leg a small mass of long loose fibers, and around these a cord has been tightly wrapped. Then the fibers have been turned upward and closely wound with the free ends of the parts of the lashing line. Nowhere has anything like this been found save in the Bowditch hooks shown in Figs. 40 and 41. In this hook these long fibers do not seem to be coconut cloth, but apparently are fibers which entered into the make-up of the line of which, unfortunately, there is nothing left. Examination of the front side of the top of the shank leg of the Bowditch hook (Fig. 41) will show an absolutely parallel structure.

It will be readily granted that these four parallelisms in structure may be accidental, but it is hard to conceive that all four similarities between our hooks and the various Bowditch hooks would occur at the same time in one hook. I regard points 5 and 6 as arguments of similarity of origin of these three eccentric hooks which are beyond controversy. And when all these points are taken together at once, in my judgment, they effectually establish the relationship of these three eccentric hooks and the fact that they are from Bowditch Island.

*Kingsmill or Gilbert Group.* This group of Micronesian islands lies northwest of Bowditch Island in the Union Group, and from it has been figured and described an asymmetrical hook which, if provided with a Bowditch barb, would present an appearance not unlike that of the two hooks just considered. This hook, figured by Edge-Partington<sup>1</sup> is reproduced herein as Fig. 67.

This hook is 10.5 inches long and has its line attached on the left side in a fashion not made clear in the crude drawing. The barb is lacking, but the barb leg is hollowed out on the back or inner side to receive the base of the barb. The outer part of the top of the barb leg has a carved depression to hold the lashing more securely. This hook is apparently made of a root, the main stem of which continues the curve of the shank, the barb leg apparently being a secondary offshoot. This hook is markedly like that shown in Fig. 64, save that the main root was cut off at the left of the curve instead of at the right.

Edge-Partington's legend gives little information—"Shark hook of brown wood. Barb missing. Twisted sennit cord. Tamana Island." Now Tamana Island is one of the Gilberts from which group certain intermediate hooks have been figured (Figs. 24 and 25), and this hook, if fitted with a barb similar to theirs, might be placed in that category. But on the other hand, it is so very like the Bowditch hooks (even if it lacks the coconut cloth wrappings), and since one is free to supply any kind of barb, I have thought it best to place it among the eccentric *Ruvettus* hooks rather than with the intermediate forms.

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<sup>1</sup>Edge-Partington, vol. II, pl. 95, fig. 1.

## RUWETTUS HOOKS FROM MICRONESIA

To the northwest segment of the South Seas is given the name Micronesia—the sea of little lands—because the islands are all small and the great majority of them are low-lying coral atolls, rims of coral sands but a few feet above sea level. Our previous study of *Ruwettus* has led us to expect that it would be caught here, and here also we may expect to find the highly specialized *Ruwettus* hook.

*Gilberts (Kingsmill Group)*. In the section dealing with intermediate hooks there were considered certain large and stout hooks from these islands which suggest how shark hooks may have gradually evolved into *Ruwettus* hooks. In the preceding sub-section there have been described certain abnormal forms of *Ruwettus* hooks from this group, and we are now ready to figure and describe undoubted oilfish hooks from the Kingsmills. This group, lies slightly west of north and not far distant (as distances go in the South Seas) from the Ellice Islands where our study of the *Ruwettus* hook started.

On the same plate on which Finsch<sup>1</sup> portrayed the round-bottomed shark hook from Nukufetau, Ellice Islands, which has been refigured and considered earlier in this paper (p. 226), he illustrates as his No. 14 and labels as a *shark* hook an undoubted *Ruwettus* hook from Tarowa (Tarawa) Island in the northern half of the Gilbert Group. His illustration (my Fig. 68) shows plainly that it is a *Ruwettus* hook, the Gilberts being one of the groups in which *Ruwettus* fishing was formerly extensively engaged in by the native inhabitants. Note the two knobs of the “saddle” on the back of the shank leg. The line, “frayed” out into its parts, has these looped below the lower “pommel,” wound around the line (on the inside of the shank) and the “saddle,” and then used to seize the lower end of the cord. This gives the line an attachment worthy of the size of the hook. The inset figure shows how the barb is made of a right angled fork and in the main figure one sees how securely it is lashed to the outside top of the barb leg by a simple scarf joint. Finsch says that this hook is called *Tingia* and that it is made of a naturally grown piece of wood “bent [?] to an acute angle.” However, the figure looks like a *fork* worked up in the usual fashion, for even a growing branch could not be bent to such an angle without such a crushing of the fibers as to make it entirely worthless. Let us note that Finsch calls this hook from Tarawa in the Gilberts or the wood from which it is made, “*Tingia*,” while Becke<sup>2</sup> says that similar root-grown hooks from the neighboring

<sup>1</sup>Finsch, 1893, pl. III, fig. 14.

<sup>2</sup>Becke, 1901, 158.

Ellice Islands are obtained from a tree called "*Ngia*." The trees are probably the same.

This hook is 14 inches over the long leg and 12 over the short one; its greatest width between the legs is 4 inches, the barb is 2 inches on the inner or lower side; and the opening between barb and shank about 2 inches. The shank seems to have been worked out of the main stem, the barb leg out of the branch. This is a *Ruwettus* hook and one of the largest



Fig. 67

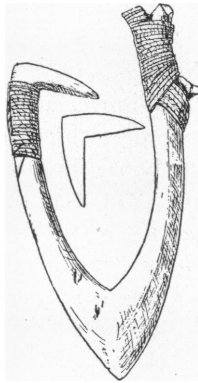


Fig. 68

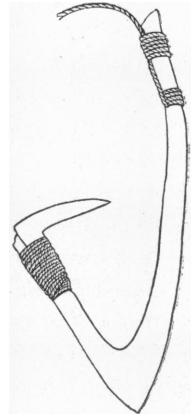


Fig. 69

Fig. 67. A 10.5-inch Unfinished Wooden Hook from Tamana Island, Gilbert Group. After Edge-Partington, vol. II, pl. 95, fig. 1.

Fig. 68. A 14-inch *Ruwettus* Hook from Tarowa Island, Gilbert Group. After Finsch, 1893, pl. III, fig. 14.

Fig. 69. An Unusual Form of *Ruwettus* Hook from the Gilbert Islands. From a photograph by courtesy of the Bishop Museum.

discovered in this research. Finsch indeed calls it a "shark" hook, possibly because of its great size—but it must be remarked that Becke<sup>1</sup> measured 14-inch Palu hooks at Nanomango, Ellice Islands. It is strange that Finsch did not recognize this as a hook for taking the "purgative fish," since he undoubtedly knew of this fish. Because of its great size and strength it may have been used for taking both kinds of fish, but that such is its primary function I cannot believe. In every detail of make up it is a *Ruwettus* hook, and it comes from a group of islands where Palu fishing was formerly, at any rate, in great repute.

Finsch did come later to know of the real use of this hook, for in his *Südseearbeiten* he writes:—

<sup>1</sup>Becke, 1901, 152.

At the Gilbert Islands, where in 1841 Wilkes was offered hooks in numbers, I found (1880) no specimens save the huge wooden hooks for catching sharks and the 'Ruvettusfisch' (Purgierfisch, *Ruvettus pretiosus*, *Thyrsites pretiosus*.)<sup>1</sup>

And in a footnote to this sentence, Finsch expressly refers<sup>2</sup> to the hook reproduced as Fig. 68.

There is another Gilbert Island hook for which a figure and description are available. Among the wooden South Sea fish hooks in the Bishop Museum, Honolulu, are a number from the Kingsmill Group. Two of these I have identified as intermediate hooks. One, however, is apparently a *Ruvettus* hook, as may be seen in Fig. 69. Its measurements are: shank leg, 12.4 inches, barb leg 7.0 inches, and greatest outside width 5.9 inches.

Made of a fork, this hook has both the *Ruvettus* shape and barb. This barb, although it points obliquely upwards and inwards toward the shank, is fashioned much more after the true *Ruvettus* type than are the barbs of the two other Gilbert hooks figured and described in the section on Intermediate Hooks (pp. 239-241). The barb has no heel but fits by a blunt scarf joint against a stay formed of the top of the barb leg. As best as can be determined this barb does not come to a "feather edge" below, but ends bluntly and is let into the top of the barb leg as a hinge is let into a door frame—probably the stump of the barb leg would resemble that shown in Fig. 14, a shark hook from the Ellice Islands. The barb of this Gilbert Islands hook is then secured by a seizing of many turns of sennit cord, apparently in two layers, of which about twenty-eight appear on the surface.

The shank leg, which is nearly twice as long as the barb leg, is decidedly bowed backward. At the top it has a two-strand twisted cord of sennit attached on the inside of the top of the shank by two sets of lashings. That of the bottom (of three turns) apparently consists of the "unlaid" strands of the cord itself; that at the top has five turns of heavy cord overlaying a number of turns of smaller cord. This is an unusual form of attachment, but apparently a rather strong one. Here again the shank is apparently made of the main stem and the barb leg of the branch.

One other lot of Gilbert Islands hooks has come to my attention. Mr. Oldman, in one of his letters says that at the time of writing he had on hand five *Ruvettus* hooks from the Gilberts. These hooks are from 7 to 12 inches in length, have barbs varying from 1.5 to 2.75 inches in length with "clearances" (distances from point of barb to shank) of 0.5 inch

<sup>1</sup>Finsch, 1914, 132.

<sup>2</sup>Finsch, 1893, pl. III, fig. 14.

0.75 inch. In weight they vary from 2 to 5 ounces. All are of wood with barbs of the same kind of wood. No details as to shape of bases and barbs are available, but they may be presumed to have V-shaped bases as Mr. Oldman understands this to be the typical *Ruwettus* hook.

In addition to the preceding data concerning the hooks, certain recitals of fishing for *Ruwettus* in the Gilberts may be quoted in corroboration. Louis Becke, whose interesting accounts have frequently been referred to, speaks<sup>1</sup> of fishing for the Palu in the Gilberts and specifically says that in 1882 at Peru, an island in the southeast part of the group, he caught fifty Palu. And again<sup>2</sup> he speaks of fishing for Palu at Butaritari in the extreme northwest. This is confirmed by Krämer<sup>3</sup> who, while he got no *Ruwettus* at Butaritari, obtained it at Makin (the most northwesterly of the Gilberts). Again he says (1901) that at Maraki he helped eat the head of an oilfish.

In this connection it should be recalled that at Maraki in 1900 Alexander Agassiz collected certain stout, round-bottomed wooden hooks which have been figured and described in the section dealing with intermediate forms—hooks in all probability used for taking both oilfish and sharks.

*Marshall Islands.* The Marshall Group lies northwest of the Gilberts and its islands line up in the same general trend. Here we would expect to find *Ruwettus* hooks and *Ruwettus* fishing, but only one hook, which is in the Bishop Museum, is known from this group. This hook is shown in Fig. 70. Its shank leg measures 11 inches, its barb leg 8.2 inches, and its outside width 5.75 inches. It is made of a fork rounded by skilful carving to give a U-shaped base. At the top of the shank leg is carved a backwardly projecting knob below which the line of attachment is securely lashed on the inside of the shank, the lashing of the talon-like barb to the barb leg covers more than half the barb leg—the longest barb lashing of any hook described in this paper. The photograph does not show it, but a pencil sketch by Doctor Ball makes clear that the barb is set on the outside of the barb leg by a plain scarf joint.

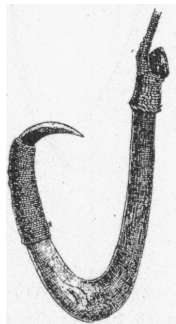


Fig. 70. An 11-inch *Ruwettus* Hook from Ebon, Marshall Islands. The only known *Ruwettus* hook from this group. From a photograph by courtesy of the Bishop Museum.

<sup>1</sup>Becke, 1901, 157.

<sup>2</sup>Becke, 1905, 128.

<sup>3</sup>Krämer, 1901, 182; 1906, 258.

This sole Marshall Islands hook, by no means conforms entirely to the normal *Ruvettus* type. In fact, but for its barb, it might be classed among the intermediate forms, since its shape and also its large size would lead to the inference that it might be used for taking sharks. However, the Marshalls are low-lying coral atolls whose reefs fall away steeply into deep water and one would confidently expect oilfishes to be

taken here. Hence, although of rather unusual form, we may take this as a true *Ruvettus* hook.

*Nauru.* Nauru, Nawodo, or Pleasant Island is an upraised coral island, a solitary outpost to the west of the Gilberts and about three hundred miles away. An obscure reference led me to Hambruch's paper<sup>1</sup> on the ethnology of this island. Here I found the accompanying figure (Fig. 71) of an interesting hook and sinker definitely stated as being used there for taking *Ruvettus*.

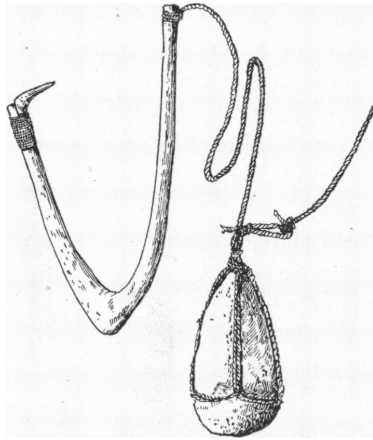


Fig. 71. Wooden *Ruvettus* Hook with Sinker, from Nauru, Nawodo, or Pleasant Island. After Hambruch, 1915, fig. 215.

The V-shaped hook is made of a wide wooden fork. The barb leg is 4 inches long and attached to it is a short blunt barb of hard wood (sometimes of bone) secured by about fifteen turns of a sennit cord. Whether the barb is fitted on by a pointed scarf joint or by a blunt ending joint blocked into the inside of the top of the barb leg cannot be said, but at any rate the top of the barb leg ends in a solid stay for the base of the barb. This barb is very short and points upward toward the shank somewhat as do the barbs of the Tahiti hook shown in Fig. 62 and of the Gilbert Islands hook in Fig. 69.

The shank leg is 5.25 inches long. At the outer end it bears a groove or notch in which the line of attachment is made fast by three turns of a cord. The lines used are two hundred fathoms long and to sink them and the wooden hooks, sinkers like that figured are used, the sinker and the hook forming a unit connected by the snood. The fisherman's line is secured to a loop in the snood above the sinker. This sinker (3.6 inches long) is of coral rock hacked into a pear shape. Around the pear near the base is cut a transverse groove in which a double line is tied, from

<sup>1</sup>Hambruch, 1915, 127.

which either three or four double cords are brought to the tip of the sinker, tied fast, and then attached to the snood. Another kind of sinker has a hole drilled transversely through it just below the top and a lashing run through this is attached by a loop to the fishing line. Both kinds of sinker are of coral, hacked or chipped into a pear shape, in order that they may slip through the water more easily when pulled up.

This hook is made of *Callophyllum* wood, is roundish in cross-section of any part, and is well finished and polished. The one figured measures 5.25 inches long, but others attain a length of 6.75 inches. The barb is sometimes made of bone. Nothing is said about a float. The fishing is done at night and a flying fish is used as bait for the "Purgierfisch." However, Hambruch expressly says that the hook is used for taking sharks and other large fish as well as *Ruvettus*. Hambruch adds two interesting statements which show that *Ruvettus* is well known at Nauru. One is that the natives have a cat's cradle figure which they call *eru* or the *Purgierfisch*. The other says that

A purgative fish is bound fast on a line and let out in the water and then when a dolphin [porpoise] appears, it is caught in a sling.<sup>1</sup>

Another and similar hook from Nauru, figured by Thilenius,<sup>2</sup> is 12 inches long, is said to be of hard wood with a wooden barb, and is used for taking both sharks and purgative fish. It differs from Hambruch's hook in three unessential details—the hook is longer, the U is wider, and instead of being comparatively straight the shank leg is bent backward in a flat angle about midway of its length. It has, however, a short barb directed upwards, exactly as figured by Hambruch, and the line is attached to the shank in the same simple and rather primitive fashion. So nearly is his figure a duplicate of Hambruch's that it will not be reproduced herein. It must be noted, however, that Thilenius expressly states that his hook was used for taking both "Purgierfische" and sharks, and it certainly is large enough (12 inches over the shank leg) for the latter.

The interesting form of these hooks from Nauru forcibly invites comparison with Demandt's from Samoa (Fig. 56) and Krämer's from the same island.<sup>3</sup> Krämer's hook has the same general shape, but the barb is shorter and points obliquely downward. In fact, it points at about the angle in Demandt's figure, but is only about half as long as the barb in Nauru hooks. Of his hook, Krämer merely says that it was used

<sup>1</sup>Hambruch, 1915, 136.

<sup>2</sup>Thilenius, 1920, 631.

<sup>3</sup>Krämer, 1903, 170, fig. 57.

for taking large fishes, but to this very sentence he has a footnote calling attention to his article<sup>1</sup> on the "Purgierfisch" and its peculiar hook. Both these Samoan hooks show a notable resemblance to those from Nauru.

*Mortlock Islands (Caroline Group).* Hedley<sup>2</sup> says that at the time of his writing there was in the Australian Museum a series of Palu hooks from the Mortlock Group. Now there are two groups of that name in the western Pacific: the northern group belongs to Micronesia, being found squarely on the southern boundary of the Carolines; the other Mortlock Islands lie west of Tasman Island and Ontong Java, and north of Choiseul in the Solomons. Their other name is Marqueen Islands or, more correctly, Marcken, and they are, of course, Melanesian. Hedley did not know from which group these hooks came but conjectured the northern. My guess was for the southern group, mainly because this group is nearer Australia and because there was and is much trading out of Sydney into the Solomons. As it turns out, both conjectures are correct.

Hedley distinctly says that the Australian Museum had a whole series of these hooks, of which, unfortunately, he does not figure a single one. These from his description are undoubted *Ruvettus* hooks, but are of great size. The largest is 17.5 inches long and weighs a mere fraction under two pounds (31 ounces). This particular hook he notes as showing plainly many tooth marks of captured fishes and he conjectures that this and also

their size suggests that they were intended for a form of Palu larger than that taken in mid-Pacific.<sup>3</sup>

Its huge size and the tooth marks led me to believe that this hook and other large ones may have been used also in taking sharks. Hedley says that these hooks had the distinctive Palu barb, but that, unlike other forms he had seen, the splicing was on the side of the barb leg—which side is not noted. These hooks all had the barb leg spiralled better to enable the Palu to swallow the bait with the enclosed barb. In all cases the shank leg had two knobs for attaching the snood or snell which is looped over the lower knob and lashed to the top of the shank by turns of sennit between the two knobs. This snood is about two feet long and ends in an "eye" or loop for "bending on" the fisherman's line. Finally, and best of all, Hedley adds:—

One Mortlock specimen has a straight stick, fourteen inches long and half an inch broad, so lashed onto the [snood or] cord of attachment as almost to hinge to the long limb of the shank.<sup>4</sup>

<sup>1</sup>Krämer, 1901, 181–183.

<sup>2</sup>Hedley, 1897a, 276.

<sup>3</sup>Hedley, 1897a, 276.

<sup>4</sup>Hedley, 1897a, 276.

Now *Ruvettus* is taken in the eastern islands of Micronesia, but there is no mention of the use of a stick or float in these regions. That this float is used with large *Ruvettus* hooks in Melanesia we shall shortly see.

It is inexplicable why Hedley did not figure and describe these hooks, especially as he does so for the aberrant Milne Bay form (see Figs. 5a and 5b). By this failure he narrowly missed being the first to describe a new type of *Ruvettus* hook. Equally unaccountable is it that Edge-Partington, who has figured so many hooks from the Australian Museum, should also have failed to portray these. Furthermore, even at this late date, it seems that these hooks have never yet been figured and described.

In response to a request the authorities of the Australian Museum furnished most interesting data and photographs of these hooks. It seems that they have two sets of Mortlock hooks; one from the Marcken Group (about which more later) and the other from the Northern Mortlocks (Caroline Group). Of these latter there are four hooks, the dimensions of which are given in inches in the accompanying table.

Hooks from Mortlock Islands, Caroline Group, in Australian Museum

	1	2	3	4
Length of shank leg	8.25	12.0	14.5	17.75
Length of barb leg	7.5	12.0	13.75	16.25
Greatest outside width	3.5	4.5	7.5	8.25
Length of barb	1.1	2.9	3.0	4.0
Clearance—barb and shank	0.75	0.5	1.1	1.9
Australian Museum No.	E1361	E1987	E1358	E1357

Here we have a uniform series of *Ruvettus* hooks ending in a giant of 17.75 inches over the shank. Evidently this is the hook of 17.5 inches of which Hedley speaks. The date of collection of No. 1 is not known, but it is said to be a "very old specimen." No. 2 was collected in 1888, and Nos. 3 and 4 in the previous year. For hooks Nos. 2, 3, and 4 a photograph was sent and from this I am able to describe them.

They are markedly alike in general shape, being made of forks, decreasing in relative width from the largest to the smallest. The shank legs of Nos. 2 and 3 seem to have been made of the main stem, while this seems to be true of the barb leg of No. 4. All have thick heavy bases—Nos. 3 and 4, blunt; No. 2, fairly pointed. In shape and angle of setting the barbs are all alike. Those of Nos. 2 and 4 are plainly set on the right side, that of No. 3 being presumably like the preceding. The barb of hook No. 2 has quite a long base and this and the barb of No. 4 are lashed

on with fine twisted sennit cords, while in No. 3 coarse flat braided sennit is used for this purpose.

The shank of hook No. 2 (Fig. 72) is made of the main branch of the fork. It has a pointed top with a knob near the end to which the line is securely attached by its unlaid parts being wound under and around the whole and their loose ends used to seize the lower end of the cord of



Fig. 72

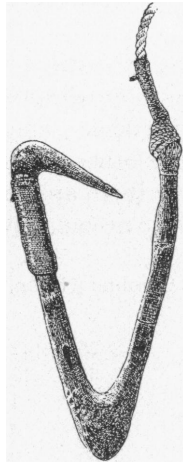


Fig. 73

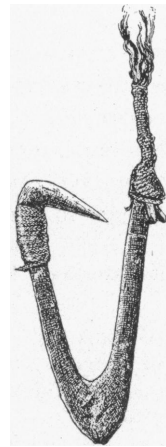


Fig. 74

Fig. 72. A 12-inch *Ruvettus* Hook with Float from the Northern Mortlock Islands (Caroline Group). Sketch from photograph by courtesy of Australian Museum.

Fig. 73. The Largest *Ruvettus* Hook on Record (length, 17.75 inches; weight 31 ounces). Sketch from photograph by courtesy of Australian Museum.

Fig. 74. A 14.5-inch Oilfish Hook from the Northern Mortlocks. This hook has the heaviest body of any known hook of this kind. Sketch from photograph by courtesy of Australian Museum.

attachment. This heavy cord extends along the lower side of the float and ends in a knot. It is fastened to the stick at both ends and the middle by numerous turns of a small sennit cord. The float is about 14 inches long. The base of the hook is heavy and pointed. The barb leg is rather slender and has the ordinary *Ruvettus* barb set on the right side. This barb has an abnormally long base, recalling that on the hook from Tubuai, Austral Isles. This is a large rather crudely made but strong hook and is the only one with float known to me from Micronesia.

Hook No. 4 is the most gigantic *Ruvettus* hook on record; it is 17.75 inches over the shank leg; its barb leg is only 1.5 inches shorter. The whole weighs 31 ounces (Fig. 73). Also noteworthy are the secure attachment of the line which is a large two-strand twisted sennit cord or rope, and the seizing of its lower portion and the upper end of the shank with a flat braided sennit line. The barb is set on the right and has a lashing of small cord which extends over nearly one third of the total length of the barb leg. The outer base of the barb leg shows deep cuts made by the teeth of captured fishes. This huge hook causes one to wonder as to the size of the *Ruvettus* fishes caught in these Northern Mortlocks.

Hook No. 3 (14.5 inches long) is intermediate in size between Nos. 2 and 4, but is made of a fork even heavier than that of No. 4. Its barb is shorter than that of No. 4 and is secured by a strong lashing of flat sennit in several layers. The top of the shank leg ends in a point having below it, on the rear, a long pointed knob below which the elements of the line are looped. The top of the shank above the knob and the bottom of the line are tightly seized with a flat braided cord. This is a very powerful hook. As has been previously stated it is intermediate between the other two and as the three make a finely graded series, it seems well to reproduce it (Fig. 74).

In addition to these four huge hooks from the Northern Mortlocks, the Australian Museum possesses a collection of six small specimens from the same group. These are so small that data were not sent for them since it seems that they could hardly be used for taking the oilfish. However, it appeared advisable to get a photograph for a study of them also. The originals are  $2\frac{1}{2}$  times the sizes shown in the photograph, and their approximate measurements (in inches) are set forth in the accompanying table. However, it must be emphasized that these measurements, made from the photograph, are approximate only (accurate probably within small fractions of an inch).

Small Hooks from the Northern Mortlocks in the Australian Museum

Number	1	2	3	4	5	6
Length of shank leg	3.5	3.25	4.5	4.5	4.6	5
Length of barb leg	3.25	3.12	4.12	4.5	4.25	4.75
Greatest width (outside)	1.0	1.2	1.9	1.6	1.75	2.5
Length of barb	0.75	0.75	1.0	1.2	0.9	1.4
Clearance (barb to shank)	0.2	0.4	0.75	0.3	0.62	0.8
Australian Museum No.	E1988	E28470	E28471	E1371	E1369	E1375

These diminutive hooks reported from the Northern Mortlocks are second in smallness only to the Young Collection in the Bishop Museum,

Honolulu, whose places of origin are not recorded, save that they are from Polynesia. These Mortlock hooks range in length from 3.25 to 5 inches. When one compares them with the gigantic hooks shown in the preceding figure, one wonders if it can be possible that they all came from the same islands. Possibly they were made as models, or merely for sale, or for playthings for children, or for catching small fishes—one conjecture is as good as another. All are of wood save No. 1 which is carved solidly out of bone—probably out of the shoulder blade of a pig. Nos. 2 and 3 have barbs cut out of coconut shell; all the others have wooden barbs. No. 1 has a cord made of *Hibiscus* fiber, all the other cords and lashings are of ordinary coir.

We will now follow the preceding general description of these hooks with a somewhat more detailed study of each hook beginning with No. 1 which is unique in that it is cut solidly out of a bone. In similar fashion it has been noted that the shark hook from Hawaii (Fig. 16) is carved out of a solid piece of whale bone. Other *Ruwettus* hooks carved of solid material are the tortoise shell hook (Fig. 50) from the Young collection in the Bishop Museum and the pearl shell hook from Tahiti in the Peabody Museum, Salem, Massachusetts (Fig. 53). This Mortlock hook is very narrow, has a very large base, and its legs are nearly equal in length. The attached cord is going to pieces and indeed is probably not the original one. This unique hook is shown herein as Fig. 75.

Hooks Nos. 2 and 3 of the table are easily set apart from the others of this lot by the outward curves of their shank legs and by their rounded bases. In these points they (especially No. 2) recall hooks from the Ellice Islands. Their hooked barbs somewhat recall these hooks also but they are unlike them in that they are short and blunt and made of coconut shell and not of wood. No. 2 also recalls the hook shown in Fig. 55 from Tahiti. However, in their cords of attachment and in the lashings of these and their barbs, they are very unlike these hooks. Furthermore, it is impossible to determine how these barbs are set on the tops of the barb legs. The barb of No. 3 is held by about twenty-one turns of coir sennit, and No. 2 by about eighteen turns, and each has two turns across the top of the barb just behind the "knuckle." Each has a two-strand sennit cord unlaidd and looped several times below the knob on the back side of the top of the shank and then the whole is securely bound by many turns of sennit cord of smaller size. These two hooks are very much alike and probably came from the same village. The larger (No. 3) is portrayed herein as Fig. 76.

Hook No. 5 has very slender limbs. Its stout barb is spliced on the left side of the top of the barb leg by many turns of a small but coarse

sennit cord, the loose end of which is caught up squarely in front. The base of this barb must be very long for its lashing covers just half the inside length of the barb leg. This specimen is so very like certain Melanesian hooks presently to be described that it does not seem necessary to figure it here.

Hooks Nos. 4 and 6 are very like each other in structure and are of nearly equal size. Both have large heavy bases and stout limbs. No. 6

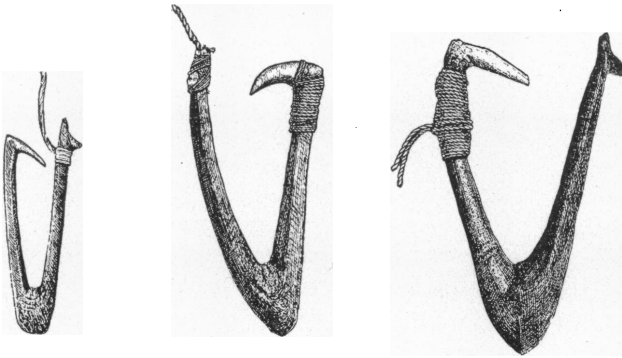


Fig. 75

Fig. 76

Fig. 77

Fig. 75. A Small Solid Bone Hook (3.5 inches long) from the Caroline Mortlocks, cut from a Flat Bone. Sketch from photograph by courtesy of the Australian Museum.

Fig. 76. A 4.5-inch Wooden Hook with Coconut Shell Barb, from the Northern Mortlock Islands. Sketch from photograph by courtesy of the Australian Museum.

Fig. 77. The Largest (5 inches) of the Six Diminutive Palu Hooks from the Caroline Mortlocks. Sketch from photograph by courtesy of the Australian Museum.

is the wider hook and is of somewhat more massive construction. Hook No. 4 has a pointed barb almost a counterpart of that on the hook from Tasman Island shown in Fig. 83a. No. 6 has a blunt barb, markedly similar to that on the hook from Ontong Java (Fig. 81). This hook is portrayed herein as Fig. 77. Apparently the barb of No. 4 is set on one side; that of No. 6 looks as though it were set on the inside.

Hooks Nos. 1, 4, 5 and 6 show marked Melanesian characters in every point save size—in shape, nearly equal length of legs, shape and size of base, design and lashing of barbs, and form of top of shank. Hooks Nos. 2 and 3 differ from the others and from the Melanesian type mainly in the form of their coconut shell barbs. These points will become clear when the Melanesian hooks are studied.

I have been unable to find any other references to *Ruvettus* hooks in Micronesia, but attention should be called to Becke's statement, pre-

viously noted (p. 273) in the section dealing with high islands, that at Kusaie (Ualan, or Strong's Island), the most easterly outpost of the Carolines, he had caught Palu. He further makes the general statement that this fish had been taken in the Marshall Islands and in certain parts of the Carolines also.<sup>1</sup>

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<sup>1</sup>Becke, 1905, 128.

## RUVETTUS HOOKS FROM MELANESIA

The quest for *Ruvettus* hooks now takes us to the far western Pacific, to Melanesia, where we will find an extraordinary *Ruvettus* fishing apparatus devised for taking what must be unusually large specimens of this fish. *Ruvettus* hooks have, so far as I can ascertain, not yet been obtained from the larger Melanesian islands, from the Bismarcks and Solomons. But from the coral atolls lying between these two groups and especially from those lying to the north and east of the Solomons a large number of remarkable forms of these hooks have been reported. These will now be described.

*The Southern Mortlocks, Marcken, or Marqueen Islands.* Lying almost squarely south of the Micronesian Mortlocks (longitude 153° 45' E.) and about 700 miles away are the Melanesian islands of the same name, more properly called Marcken Islands. They are a small group of coral atolls (not found on most maps) lying north of Choiseul in the Solomons in longitude 157° E. and about in latitude 5° 30' S., and in them *Ruvettus* fishing is, or at any rate in comparatively recent times, was carried on with enormous wooden hooks, each provided with a float.

In the Australian Museum there are two hooks from the Marcken Islands, and in the Field Museum two others. In the subjoined table their relative measurements are set down—those of the Australian Museum hooks coming first. Lengths are given in inches; weights in ounces.

Hooks from Marcken Islands in		Australian Museum		Field Museum	
Number		1	2	3	4
Shank leg	{ Outside	11.5	12.5	12.0	12.5
	{ Inside			9.5	10.0
Barb leg	{ Outside	11.0	12.4	11.9	12.0
	{ Inside			8.8	8.8
Weight of apparatus	{ Total			9.5	7.9
	{ Hook			7.8	6.5
Greatest outside width		4.5	6.5		
Length of barb		2.4	3.9	3.75	4.5
Clearance of barb		0.7	0.5	1.0	0.7
Museum No.		18613	24786	106641	106640

From the table it is clear that these are large V-shaped hooks, particularly remarkable in that the barb legs are practically equal in

length with the shank legs. All four of these hooks have floats, as in fact do all the Melanesian hooks now to be described, although in some instances the floats have become detached from the hooks. Hook No. 1 (Australian Museum) has a 20-inch float with a line one inch long attaching it to the hook. In hook No. 2 the float is 17.75 inches long and the free line joining it to the hook is 1.75 inches long. In all these hooks the line is lashed to the float at three places, but in the Niue hook described on pp. 278 and 279 the line makes half hitches around the float.

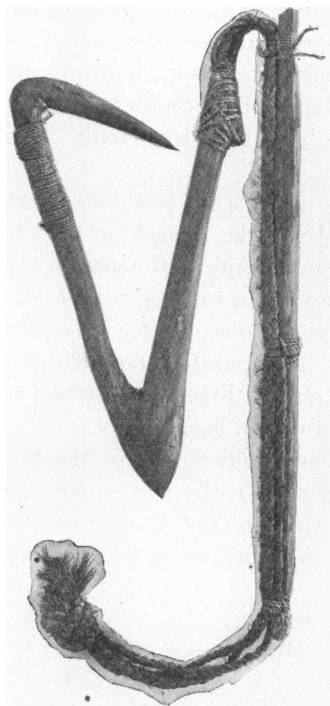


Fig. 78. A 12.5-inch *Ruwettus* Hook from the Southern Mortlock (Marcken) Islands, with Long Pointed Barb and Float with Attached Cord. Courtesy of the Australian Museum.

Both hooks (of which a photograph lies before me) have bluntly pointed bases. The barb leg is formed of the side branch and the shank of the main stem of the fork. Both have keenly pointed barbs closely approaching the shank. That of No. 1 is plainly set on the right side of the top of the barb leg, but that of No. 2 cannot be made out. Both barbs are lashed by many circumferential turns (about twenty-eight in No. 1 and about thirty-eight in No. 2) of a small twisted sennit cord. The lashings of the lines to the tops of the shanks and to the floats are identical (see Fig. 78) and call for no description. The line of No. 1 is composed of two cords of twisted sennit; that of No. 2 of three flat plaited cords of three strands each.

The first of the Field Museum hooks (No. 3 of the table) is worthy of description and this is possible by reason of the photograph (Fig. 79) supplied by the Field

Museum. The barb leg here seems to be made of the limb and the shank of the main stem. The barb is of the normal shape but has an extraordinarily long base which is set on the left side of the barb leg and lashed fast by many turns of a cord of sennit. The base of this barb is about 6 inches long, about twice as long as the inside length of the barb (2.9 inches)—i.e., the barb is longer and larger than some *Ru-*

*vettus* hooks figured and described in this paper. The cord of attachment seems to be made up of three flat braided cords of sennit lashed fast to the top of the shank leg by a smaller twisted cord. The three separate cords then extend along the under side of the float to which they are lashed fast by smaller twisted cords at each end and in the middle. Beyond the float the snood consists of two of the flat braided cords.

The other Marcken hook (No. 4) in the Field Museum is interesting in that it is the most V-shaped of any of these Melanesian hooks. The fork was naturally a very narrow one and has been left untouched by the knife of the artificer. The base of the hook has been cut into a nice rounded point. The cord of attachment is large and strong, and lies on top of the float, to which it is lashed at the middle and at the inside end—the outer lashing being gone. The barb is of the ordinary form as is its lashing. Other than these there are no points about this hook worthy of mention, nor does it seem necessary to figure it.

So far as I know, no other *Ruwettus* hooks have ever been described from the Marcken (Marqueen or Southern Mortlock) Islands. Hooks, however, have been recorded from other coral atolls lying to the north-west, north, and east of the Solomon Islands. Description of hooks from these islands will now be taken up in order.

*Nissan* (*Sir Charles Hardy Group*). *Nissan* is a large coral atoll, forming the last northern outlier of the Solomons, and in a sense is a connecting islet between this group and the Bismarck Archipelago. It lies about seventy miles west of north of Bougainville and about 3° or two hundred miles almost due west of the Marcken Islands. An obscure reference led me to Krause's article on the ethnography of this island and to his figure and description of the *Ruwettus* hook used there.<sup>1</sup>

Krause, among many other ethnological articles from *Nissan*, describes a *Ruwettus* hook of large size

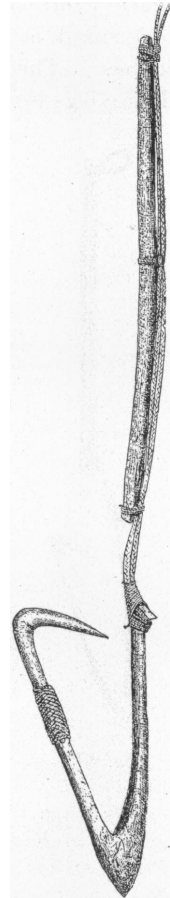


Fig. 79. A 12-inch Wooden *Ruwettus* Hook and Float from the Marcken (Southern Mortlock) Islands. Drawn from a photograph by courtesy of the Field Museum of Natural History.

<sup>1</sup>Krause, 1906, 126.

made from the usual fork. This hook and float are shown in Fig. 80. The shank is 14.4 inches long and the nearly equally long barb leg 14.2 inches. The barb is 3.2 inches long and almost touches the shank. These legs form a narrow V. The hook is attached by a stout cord 4 inches long to a float 23 inches long and 0.7 inches thick. Along the under side of the float run six twisted cords securely lashed fast to the float at both ends and in the middle and terminating at the outer end in a loop to receive the fisherman's line.



Fig. 80. A 14.4-inch *Ruvettus* Hook and 23-inch Float from Nissan Island, lying just northwest of Bougainville. After Krause, 1906, p. 126.

Krause's hook is markedly like those figured by Parkinson (to be considered later) and almost identical with those found in the Field and Australian Museums. It is figured herein to put on record this very fact of identity with hooks from the Ontong Java group three hundred fifty miles to the southeast and to show the identity in fish fauna and fishing apparatus. However, Krause did not know it as a *Ruvettus* hook but says that it was used for taking the "Meerschwein" (*Phocaena communis*). This of course is an error, for so far as is known, the porpoise is never taken on a hook, and this certainly is a *Ruvettus* hook. All of which facts were recognized and the proper correction made by Finsch.<sup>1</sup> Moreover, the real explanation of the matter is probably to be found on p. 299 wherein it is shown that at Nauru the purgative fish is used as a bait to entice the dolphin alongside the canoe, where it is caught in a sling—a common method of taking all large fishes in the South Seas.

*Nuguria Atoll* (*Abgaris* or *Faed Islands*). Lying about eighty-five miles east of north from Nissan and about one hundred ten miles due north of the northwestern tip of the Solomons is the group of coral atolls known as the Abgaris or Faed Islands. The southernmost and largest atoll is Nuguria about in 154° 50' E. long. and 3° 30' S. lat. Our knowledge of the occurrence of the *Ruvettus* hook here is confined to this solitary statement by Parkinson:—

..... at Nuguria the hook is likewise in existence, but the *Ruvettus* fishing is dying out.<sup>2</sup>

Parkinson, however, spent thirty years of his life in the South Seas, particularly in the western portion, and probably knew the Melanesian

<sup>1</sup>Finsch, 1914, 213.

<sup>2</sup>Parkinson, 1907, 536.

people as no other ethnologist had or has done. His word may be taken as final.

*Buka.* Krause who, as seen above, has described a fine *Ruvettus* hook from Nissan, says that this kind of hook is also said to be used at Buka.<sup>1</sup> Now Buka is an island lying about thirty miles southeast of Nissan and about one hundred almost due south of Nuguria. It is not a coral atoll as are all of the other islands treated in this section (Melanesia), but is a high island lying just northwest of the outer tip of Bougainville,—it is one of the Solomon Islands proper. It is significant then that *Ruvettus* fishing is practised in one of the Solomon Islands proper, and it is likely that this is true of other islands also. Here again we have this fishing at a high island contrasted with the normal situation which calls for coral atolls only.

*Tasman and Ontong Java (Lord Howe Islands).* Lying about three hundred twenty-five miles due east of Buka, about one hundred seventy miles southeast of the Marcken Islands, and about one hundred miles north of Ysabel in the Solomons are the neighboring outlying atolls of Ontong Java and Tasman. The latter atoll is about thirty-five miles north of the larger one, but they are so close to each other physically and ethnographically that they will be treated as one group. It may be noted that Captain Tasman, who gave his name to the smaller atoll, discovered them both in 1700.

Our introduction to the interesting *Ruvettus* hooks used in these islands is from the pen of Robert Parkinson, who, writing on the ethnography of these islands in 1897, first figures and describes the curious Palu fishing apparatus from Ontong Java shown in Fig. 81. This rather crude U-shaped hook ending in a point below is plainly made of a fork. The barb leg is nearly as long as the shank. There is no indication as to which side of the top of the barb leg the barb is lashed fast. The barb is even cruder than the hook, is made of a rough *unsharpened* branch (recalling that in Fig. 77 from the Northern Mortlocks) and could not penetrate the mouth of the "Purgierfisch." The barb leg is either bent at the top or the main branch has been cut off and the cord of attachment secured to a lateral branch left for that purpose. At any rate, the cord of attachment is most securely knotted to the top of the shank, and thence extends to a square wooden stick which serves as a float. To this float the cord of attachment is lashed fast (apparently on the back side) at both ends and in the middle. At the outer end of the float we find four cords extending out and ending in or forming one line. About midway between the end

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<sup>1</sup>Krause, 1906, 126.

of the float and the beginning of the line the cords are bound together by a circumferential lashing.

It seems well just here to quote exactly Parkinson's statement concerning this extraordinary fishing apparatus:—

The hook, pl. X, fig. 16 [my Fig. 81], is used for catching sharks, the form being the same upon all the islands. It is made of hard wood, the longer arm being from 20 to 30 cm. [7.9 to 11.8 inches] long, the shorter 15 to 25 cm. [5.9 to 9.9 inches]; at the upper end of the shorter arm the barb itself is fastened by a cord of coconut fiber, at an angle of from 45 to 50 degrees, so that the point is often only about one cm. from the longer arm. The longer arm has a projection which ensures the better fastening of the lines; the lines are bound round with thinner cord to form a strong

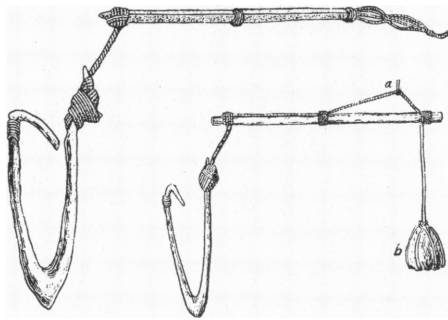


Fig. 81

Fig. 82

Fig. 81. A Wooden *Ruvettus* Hook with Blunt Barb and Float, from Ontong Java. After Parkinson, 1897, pl. X, fig. 16.

Fig. 82. Hook, Float, and Sinker used for catching *Ruvettus* at Nukumanu (Tasman) Island, Solomon Group. When the sinker, *b*, strikes bottom, the stick or wooden float will up-end and will cause the hook to float clear of the bottom. After Parkinson, 1907, p. 537.

rope of 7 to 10 cm. [2.75 to 4 inches] in length, which is again fastened by cords to a rod 45 to 55 cm. [17.8 to 22 inches] and it is surprising to find that the fish line proper is attached only at the end loop of the rod. In Ontong-Java these hooks are called 'auu.' I have never seen sharks caught with this apparently very clumsy hook and I particularly cannot understand how it is possible for a large fish to be taken by a hook that allows so little play.<sup>1</sup>

It will be noticed that Parkinson calls this by the usual name of "shark" hook. This name is almost, but not quite, universal throughout the South Seas, apparently being applied to any unusual form of large wooden hook in the erroneous belief that large or small hooks made of wood or any material other than pearl-shell or tortoise-shell are used *only* for taking sharks. Later, we shall see that Parkinson learned better.

<sup>1</sup>Parkinson, 1897, 142.

In 1903, Thilenius, a German ethnologist, in the course of an extensive paper on things Melanesian, states that at Liueniua (Ontong Java or Lord Howe Atoll) among other hooks there is found

. . . . . also the peculiar wooden hook, ordinarily designated as shark hook . . . which was known to Krämer [who will be quoted presently] for taking the purgative fish (*Ruwettus* sp.) in the Gilbert Islands.<sup>1</sup>

This clears up the matter of the use of the hook for taking *Ruwettus* in these western islands, but it is evident that Thilenius knew nothing of the stick and its use. This is reserved for Parkinson himself. It is to be regretted that Thilenius gives no figure.

The author, whom we quote next, is the same Parkinson who in 1897 first described the combination hook and stick apparatus from Tasman. He now clears up the whole matter. Speaking of fishing apparatuses at Nukumanu or Tasman Island, he says anent certain ethnological objects:—

The most interesting is a large hook made of wood, known generally as a shark hook, which, however, is not used to catch this predatory fish but to catch a certain species of *Ruwettus* which swims beyond the reefs. This *Ruwettus* is widespread over the South Seas, and it is caught here with about the same kind of hook as at the Gilbert and Ellice Islands, where the fish is called 'ika na peke.' Also in some of the Carolines the fish and the hook are not unknown, and at Liueniua [Ontong Java] and Nukumanu [Tasman] we find the hooks in general use. At Tauu [in the Marcken group] I found the hook, but the fishing was no longer carried on; at Nuguria [in Abgarris or Faed Is.] the hook is likewise in existence but the *Ruwettus* fishing is dying out. *Ruwettus* lives in deep water beyond the reefs and never comes into the lagoons. The fishing is only done on dark nights and for this purpose the boats must go out on the high sea. During this *Ruwettus* fishing it frequently happens that the boats with their crews through sudden squalls of wind lose sight of the island and are driven to other districts. The *Ruwettus* hook or 'auu' is made of hard wood, the longer arm of the hook being 20 to 30 cm. [7.9 to 11.9 inches] long, the shorter one 15 to 25 cm. [5.9 to 9.9 inches]. At the upper end of the short arm is fastened at an angle of from 45 to 50 degrees with coconut fiber a barb, in such a manner that the point is only about a centimeter [.4 inch] distant from the longer arm of the hook. At the end of the long leg of the hook is a projection for the more secure fastening of the cord. This consists of a number of thin strands bound round with similar cord so as to make a strong rope of from 7 to 10 cm. [2.75 to 4 inches] long; this hangs from a rod of from 45 to 55 cm. [17.8 to 20 inches] in length. At the end of the stick extends an open loop. The manner of employing this hook is shown in fig. 89 [my Fig. 82]; a, is the line by which the hook is sunk; b, is a heavy block of coral that drags the end of the stick down to a horizontal position in the water, so that the hook fastened to it hangs free.<sup>2</sup>

Parkinson's account very effectually clears up the matter of the use of float and sinker, although the hooks figured by him (my Figs. 81 and 82)

<sup>1</sup>Thilenius, 1903, 54.

<sup>2</sup>Parkinson, 1907, 536.

are very crude compared to some of the finely finished ones (especially from Polynesia) already figured herein. In this respect compare the two hooks figured above with that shown in Fig. 59 and doubtfully labelled New Guinea by Edge-Partington. However, one must admire the ingenious device of the sinker and float, which at once brings the hook to the bottom and yet lifts it clear of the loose coral. Certainly this is an efficient fishing device.

Before leaving Parkinson several points need emphasizing. First let us note the similarity in the general shape of Parkinson's two hooks, the latter being in some points better finished. Note the similarity in the knots by which the line is attached to the top of the shank, and also the fact that the line (here on top of the float) is lashed fast to it at both ends and in the center. The barb in the latter hook is plainly set by a scarf joint on the outside of the top of the barb leg. Attention is called to the pear-shaped sinker and to its method of suspension in a mesh of cords. Compare with the better forms from Niue on pp. 281 and 282 (Figs. 60-61).

It should be noted that *Ruwettus* at Tasman and Ontong Java bears the native name *Lavenga*. Fishing for it is a favorite but dangerous sport since the fishermen are subject to frequent squalls which call for expert sailing and steering, especially since the fishing is done at night. When boys are allowed to go on such trips it is a sign that they have reached manhood.

In 1903, C. M. Woodford, whose life and explorations in Melanesia covered many years, presented to the Australian Museum two *Ruwettus* hooks from Ontong Java (Lord Howe Group). In the following table are given the dimensions of these hooks in inches:—

	1	2
Length of long leg	11.25	13.5
Length of short leg	10.9	12.1
Length of barb (outside)	2.75	2.5
Clearance of barb	0.3	0.9
Greatest outside width of hook	4.4	5.1
Australian Museum Number	12216	12217

From these measurements it is plain that these two hooks fall in line with the Ontong Java specimens just studied. Both have floats. That of No. 1 is attached three inches distant from the top of the barb leg and is 22 inches long. A ten-fold sennit line is lashed to it. This hook is labelled "For taking a fish called *Lavenga* which is [said to be] distinct from *Palu*." The second hook, a very old one, has a float of 20.5 inches attached two inches away from the shank. The line is lashed to this

float at each end, but medially the line makes a half hitch turn around the stick. These are surely large and strong hooks and we have here an indication that *Ruwettus* in these parts (called *Lavenga* in contradistinction to *Palu*) is a larger fish than the *Palu*.

Corroboratory of Parkinson and explanatory of the statement about the *Lavenga*, which being in quotation marks is probably Woodford's own label, we will now hear Woodford himself, who writes in 1916 that:—

The Ontong Java natives are of course adepts at all kinds of fishing, but one of the most extraordinary is the method of fishing for the deep-sea fish known in the Ellice Islands as the palu. . . . I was assured at Sikaiana, where the natives also fish for this species, that the "palu" was a comparatively small fish for which they fished with a smaller hook and at a depth of about 50 fathoms, but for the much larger fish, which they called "lavenga", they fished at a depth of 200 fathoms. The hooks which I exhibit to-night are lavenga hooks from Ontong Java. One of them has been in use, and the marks of the teeth of the fish may be noticed on the bend. I was told that the lavenga reached a length of from a fathom to a fathom and a half.

I believe the scientific name for this fish to be *Ruwettus*. I have never seen a specimen, but it has sometimes been referred to as the Castor Oil fish, as it is said to have a highly purgative effect upon those who eat it. The palu hook of the Ellice group appears to be attached directly to the line, but in the case of the lavenga hook a stick of wood intervenes, weighted at the end near the line with a heavy stone, causing the stick to remain horizontal in the water whilst the hook hangs suspended from the other end. This probably helps the fisherman to notice a bite more readily when fishing at great depths.

The whole of the bend of the hook is covered with a fish bait, preferably flying-fish, which is firmly lashed on, and I am told that the lavenga gnaws its way down the bend of the hook until the barb is well back in the side of its mouth. As fishing for lavenga and palu in this and other groups only takes place on dark nights and in deep water outside the reefs, it is probable that many accidents have occurred, through sudden squalls and change of wind, and that the dispersal of natives from island to island has been facilitated by this singular but evidently hazardous method of fishing.<sup>1</sup>

The measurements of the lavenga hooks shown are:—

	I	II
Shank	13.5 inches	13.0 inches
Bend [barb leg ?]	12.5	12.25
Barb	4.5	4.0
Distance between point of barb and shank	0.75	0.75
Length of stick [float]	16.5	16.5
Weight with attached stick	10.5 ounces	11.0 ounces

These data thoroughly agree with and corroborate Parkinson's accounts in every single point. Woodford's hooks give somewhat larger measurements than Parkinson's but agree admirably with the measurements of other Ontong Java hooks presently to be tabulated. It is

<sup>1</sup>Woodford, 1916, 34-35.

greatly to be regretted that Woodford gives no figures of these hooks which he had on exhibition. He does, however, state that the fishes are of a size (6 to 9 feet long) commensurate with that of the hooks. There seems further, however, to be a distinction made by the natives betwixt the *Lavenga* (surely *Ruwettus*) and the Palu, a much smaller fish. But Woodford speaks of its being caught with a "smaller hook", not a different one. Woodford speaks of the Palu hook of the Ellice Group used for taking *Ruwettus*, and evidently took the Ontong Java Palu for a small *Ruwettus*. Whether this is a small species or the young of the big *Ruwettus* is of course a matter of conjecture, but it is interesting to recall that the young of the tarpon, itself a large fish apparently living in deep water but coming near shore at certain seasons, seem to live entirely in shallow water while they are getting their growth.

As to Woodford's opportunities for gathering exact data on the matter in hand, it need only be stated that he was for many years Resident Commissioner in the Solomon Islands and as such his time was largely spent in traveling through these islands. Few men have known the Solomons better.

An almost exact counterpart of Parkinson's hook (Fig. 82) from Nukumanu (Tasman Island) is one figured by Thilenius<sup>1</sup> from the same island. It is 11.3 inches long and is made of some hard wood. It is attached to a wooden stick or float, to which the line is bound fast, exactly as shown in Parkinson's figure. Thilenius in the text makes a brief statement that it is used for taking the "Purgierfisch", specifying that there is a sinker which carries the apparatus to the bottom while the stick serves as a float to lift the hook clear of the coral rocks and thus to prevent the line from being torn by the fish, presumably when, as stated by Becke, it tries to get its head into interstices of the coral to free itself of the hook.

Thilenius's apparatus is so markedly like that figured by Parkinson (Fig. 82) and so nearly like the Field Museum specimens now to be considered, that it does not seem necessary to reproduce it herein. Furthermore, his figure is so small as to show no details whatever.

After the preceding part of this section of this paper dealing with hooks from the Ontong Java region had been written, it was learned that there were in the Field Museum, Chicago, a number of *Ruwettus* hooks. On application to the authorities, six of these were kindly sent on for study here. These are all labelled *Ruwettus* hooks, and come from Ontong Java, or from Tasman Island. Two of these hooks are accom-

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<sup>1</sup>Thilenius, 1920, pl. 57, fig. 12.

Ruvettus Hooks from Ontong Java and Tasman Islands in the Field Museum, Chicago

Number	Measurements in inches	1	2	3	4	5	6	7	8	9	10	11
Long leg	{ Outside	10.25	12.5	12.5	12.75	13	13	13.25	15.0	15.0	15.5	16.25
	{ Inside	8.75	10.1	10.0	10.25	10.4	10.9	10.5	11.6	12.5	13.0	13.1
Short leg	{ Outside	9.6	10.75	12.0	12.5	12.5	11.9	11.75	13.9	11.5	12.5	14.1
	{ Inside	8.75	8.00	8.75	9.1	9.75	8.75	8.25	10.1	8.9	9.1	10.9
Barb	{ Outside	3.25	3.75	3.9	3.25		4.1	3.8	4.1	3.6	3.0	2.4
	{ Inside	2.5	2.9	2.9	2.4	Missing	3.1	2.75	3.6	3.0	2.9	1.6
	{ Clearance	0.6	.3	0.6	0.4		0.25	0.5	Touch- ing	0.5	0.25	0.3
	{ Hook	6	5.25	8.5	9.5	7	6.25	10.	8.75	8.05	9.75	10.75
Weight in ounces	{ Hook and float	11.25	9.25	11.25	12.75	11.25	9.25			14.5		
Width		3				3.8		3.0	2.75		2.1	2.0
Source		O.J.	O.J.	O.J.	O.J.	Tas.	O.J.	O.J.	Tas.	O.J.	Tas.	Tas.
Museum Number		107655	106604	106607	106605	107663	106603	107656	107657	106606	107659	107660

panied by their wooden stick floats. These, however, have become separated from the hooks. The lines of attachment in two other hooks are also broken off, and they lack the floats. The two remaining hooks have the tips of the shank legs entirely bare, one lacks the barb, and another shows considerable evidence of gnawing by the chisel-like teeth of some rodent. Altogether it is plain that these six hooks have had hard usage before coming to a resting place in the Field Museum.

In addition to the six foregoing specimens, there are in the Field Museum, five other hooks from Ontong Java or Tasman in fine condition. These are on exhibition and hence could not be sent, but, through the courtesy of Assistant Curator C. L. Owen, photographs and measurements were sent me, and in addition, Doctor A. B. Lewis has kindly supplied data asked for on certain specific points. These five hooks all have floats. All these hooks were collected by the Robert Parkinson who has just been quoted. In the table on p. 317 complete measurements for these eleven hooks are given, an attempt being made to grade them from smallest to largest.

In brief explanation of the omissions and discrepancies of the table, certain points should be noted before any study of the hooks is taken up. Hook No. 5 has neither barb nor remnant of cord of attachment. Were both present its weight would be somewhat greater, while the presence of a barb would have added slightly to the length of the barb leg. Hooks Nos. 7, 8, 10 and 11 lack floats. The other hooks fall into two categories; those for which photographs were sent all have floats attached, and of the hooks sent me two have the floats detached but numbered and accompanying the hooks. The weights of hooks and floats were ascertained by using scales, the weights only of these hooks are, of course, estimates. The barb of hook No. 8 touches the shank, probably caused by the drying and warping of the wood. Widths can be given only for the hooks sent me.

Some marked characteristics common to all these hooks may well be presented before any consideration is given to individual examples. These hooks are all very long, especially so in the barb legs. The barbs are set on with very little spiralling and their points approach comparatively close to the shanks. The hooks show very little finish (hardly more than the removal of the bark) when contrasted with other hooks figured in this paper. With one exception (to be figured later) the two legs make an acute angle where they rise from the common stem and the inner base of the hook has, in most cases, no rounding out with the knife; in those which show the use of the knife but little work has been done. In other words, the fabricators of these hooks made as much use as

possible of nature's handiwork and spared themselves as much labor as they could. All these things lead one, on first looking at these hooks, to conclude that they are far narrower than any hooks yet studied. This is true of two hooks, while one is the widest normal *Ruvettus* hook found in this study. Apparently, in all cases, the shank leg is the main shoot and the barb leg the secondary branch.

The bases of the hooks sent me show the crudest workmanship of any part of the hooks. One is bluntly rounded, one very sharp pointed, two have the base cut chisel-like in a right-left plane, and two have their bases cut down into rough blunt points. The bases of those on display in the Field Museum (as shown in the photographs sent me) seem fairly well finished. Still less, however, has been done on the inside of the fork, the inner curve, so to speak, of the hook. Of the eleven hooks, but two have the inner bases rounded out neatly; a few others have the bases crudely widened by a few strokes of the knife; and about an equal number have had nothing done beyond the removal of the bark.

One hook is black, possibly with age and exposure, but seems to be of the same wood as the others which are made of a reddish, very hard, and fairly heavy wood. As in the case of the bases, the legs show little finish. Little has been done beyond the removal of the bark and sap wood. Most of them show the longitudinal ridges and other marks left by the knife, some seem to have had some longitudinal scraping to reduce the ridges, but none show any evidence of the careful sharkskin raspings and shapings found in many Polynesian hooks—those from Funafuti, for instance.

More variable and more interesting are the barbs and the methods of their attachment. These have but little spiralling, some point squarely at the shank and but two of those examined and one in the data sent by Doctor Lewis have the point clearing the shank leg. Two or three of the barbs are claw-like, but most of them are fairly straight on the under surface, and all point downward at a sharp angle. In all, the "clearance" is very limited, being but one inch in the widest and growing steadily less in the other hooks until in No. 7 the point of the barb actually touches the shank. With the exception of No. 11, in which, as will be seen later, the two legs are nearly parallel for half their length and very close to each other and the barb very short, the barbs show a very uniform length varying from 3 to 4.1 inches outside measurement and from 2.4 to 3.6 inches on the inside.

Of the eleven hooks, four have the barb set on the right side of the top of the barb leg, two have it on the left, three have it set on the inner

side, while two are apparently set on the right side, since no scarf joint can be distinguished in the photographs sent me—the hooks all being shown lying on their right sides. None has the barb set on the outside of the top of the barb leg. However, the most interesting thing about these barbs is of the offset or “chog” carved at the top of the barb leg with a corresponding structure cut in the basal part of the barb whereby it is held securely against the surgings of a heavy *Ruwettus* with the hook set in his jaw or gills. These structures are shown in Fig. 83a, and as may be seen in Figs. 84, 85, and 86 such are certainly needed, since the lashings around the base of the barb seem scanty and not very secure.

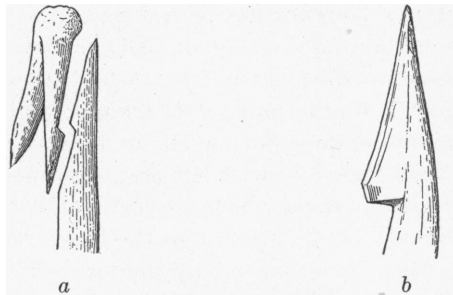


Fig. 83. *a*, The Top of the Barb Leg of a Hook from Tasman Island, showing the Shoulder in the Leg and the Corresponding Offset in the Barb, by which a Firm Hold is secured when lashed Together, Barb drawn somewhat displaced to the left; *b*, Tip of a Typical Shank Leg of Ontong Java and Tasman Hooks showing Knob below which Line is secured. Sketches from a hook in the collections of the Field Museum of Natural History.

The lashings in the hooks sent me run in from sixteen to twenty-two circumferential turns of a coarse and poorly made sennit (one hook, as noted before, has no barb). In one hook the lashing is simply circumferential. In the others it is so seized on as to have a raphe on the outer right side in three cases and on the left in one case. In two hooks the lashing is one layer deep below, becoming two at the bend of the barb; in three cases, it is two layers deep below becoming three at the bend. In the photographs the turns of lashing run 14, 15, 18 (two hooks), 25, and 26. However, the lashing in these last hooks seems to be of better quality, better put on, and apparently in two layers. The barbs of the five hooks before me are all fairly loose, but not one is removable, leading me to believe that all have the articulated scarf joint as shown in Fig. 83a.

In each of the hooks the top is carved into a more or less backwardly slanting fine-pointed tip so that the line, when lashed fast on its front or

inner side will have a straight pull on the barb leg when a fish is struggling to free itself from the barb. On the back side of the shank, and at the base of this pointed tip, is a slightly downward curved shoulder. Two of the hooks loaned me have no remains of the line of attachment. In the other four and in the five of which photographs were sent me the lines have had their lower ends unlaid and the loose strands have been looped right-left and left-right below the knob, then across each other several layers deep to fit snugly around the pointed tip of the shank. Then, in all cases save two, they have been used to seize that portion of the line between the top of the shank of the hook and the point where the line is attached to the float. The form of the top of the shank of all these hooks is typically that shown in Fig. 83b.

Hooks Nos. 1 and 5 have detached floats, each bearing the same number as the hooks to which they belong. No. 1 is 22.5 inches long, 2.5 inches in circumference at each end, and slightly less in the center. Depending at each end is a cord. One of these, probably the one for attachment to the line, is composed of about twelve components (badly broken and not easy to count), and extending from these out along the float to the next circumferential lashing are twelve cords of flat braided sennit. At this point, the cord is broken, but at the end next the hook eleven strands can be counted. These are lashed fast to the end of the stick and seized by the loose end of the lashing to form the upper fragment of the cord of attachment which corresponds exactly with that found on the shank of the hook.

The stick or float for No. 5, like the hook to which it belongs, is in bad condition. It is 24 inches long and averages 2 inches in circumference. The remnants of the cord with their lashings are found at each end and the middle, all else being gone. This stick is of very dark wood, the other is rather reddish. Both are rather heavy. For good representations of these floats see Figs. 88 and 89. The two sticks before me are markedly like the latter and both come from Ontong Java.

In all there are eight hooks on display in the Field Museum, Chicago, of which photographs were sent me. All have floats, i.e., these fishing apparatuses are complete save for the sinkers. Five of these are from Ontong Java, and two from the Marqueen (Marcken) or Mortlock Islands, already considered, and one from Sikaiana presently to be taken up. For these hooks no measurements are available, but they are apparently about the same size as those measured, if one may judge by the relative lengths of hook and float in each case. All five hooks from Ontong Java have the line attached along the under side of the floats. Four

have the line lashed to the stick at three places, the two ends and in the middle, and one has four lashings, undoubtedly due to the fact that the outer end of the float has a bend. The second intermediate lashing is at this bend and is plainly intended to prevent a sag in the line which would have caused it to become caught in the coral. In four of these specimens the line attached to the float is composed of from four to seven braided cords not twisted into a unit cord, and in one only is the line a twisted one (a unit). One of the two Mortlock hooks has the line twisted and one has it made of loose strands. Each has three lashings.

Some individual peculiarities of each of these five Ontong Java hooks will now be noted briefly:—Hook No. 1 had a barb markedly like Parkinson's shown in Fig. 81 and like that from the Caroline Mortlocks (Fig. 77). At first it was thought (the hook under consideration having been collected by Parkinson) that this was the identical hook which he had figured in 1897, but it cannot be, since the mode of lashing the line is altogether different. Both barb and snood of the present hook are lashed on by a cord of flat braided sennit very crudely made. The snood is seized with the same sennit run over and under, making a marked raphe which spirals around the four-inch remnant of the base of the snood. The base of the hook is very thick and club-shaped, measuring 5.5 inches in girth. The greatest width of the hook is 3 inches.

Hooks Nos. 2, 3 and 4 of the table (all from Ontong Java) present no peculiarities worthy of note and may be passed without remark. No. 5 from Tasman Island is made of a blackish wood, and lacks both barb and cord of attachment. Unlike the other five Tasman and Ontong Java hooks from the Field Museum, its legs do not lie in the same plane, but are naturally spiralled. However, the scarf joint was so cut at the top of the barb leg as apparently to make the barb point squarely at the shank. The thick club-shaped base is 5.5 inches in circumference. The inner surfaces of both legs show many tooth scars which are indicative of much use. The barb leg of No. 6 from Ontong Java, is so bowed as to bring the top nearer the shank and, partly as a result, the tip of the barb approaches to within 0.25 of an inch of the shank.

Hook No. 7, also from Ontong Java, is a very large and heavy hook (exceeded in weight by No. 11 only). Its circumference measurements are: of base, 6 inches; of shank leg at fork, 4.5 inches; of barb leg at same level, 3.5 inches. This hook (weight 10 ounces, length 13.25 inches) is shown in Fig. 84. The barb is set on the inside of the tip of the barb leg and a small shoulder can be seen behind the heel of the barb. The figure shows clearly the method of lashing fast both barb and snood and in both

cases shows the raphe formed by the peculiar method of seizing. The remnant of the snood is 5 inches long. This hook is typical of all the Field Museum specimens from Ontong Java and Tasman.

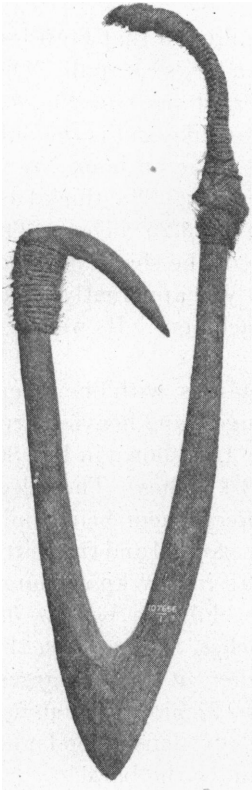


Fig. 84

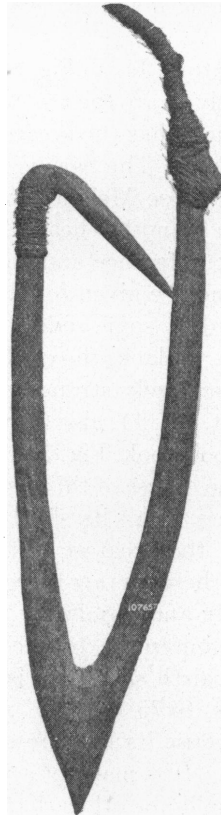


Fig. 85

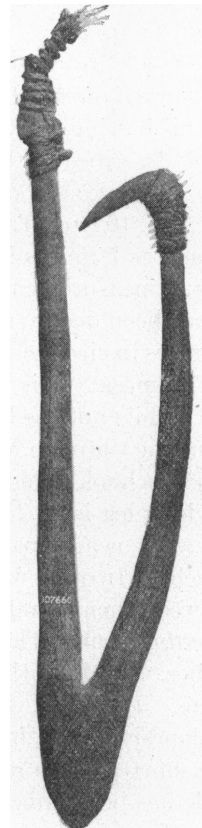


Fig. 86

Fig. 84. A Strong Wooden Hook (13.25 inches over all) from Ontong Java. Courtesy of Field Museum of Natural History.

Fig. 85. A *Ruvettus* Hook (15 inches long) from Tasman Island. Crudely made of a heavy reddish-black wood with pointed base and barb touching the shank. Courtesy of Field Museum of Natural History.

Fig. 86. A Huge Parallel-Limbed *Ruvettus* Hook from Ontong Java. Length, 16.25 inches; weight, 10.75 ounces. Courtesy of Field Museum of Natural History.

Hook No. 8 of the table (from Tasman) presents three points of interest. The two legs are more nearly parallel than any Melanesian hook yet studied; the base is so sharply pointed that it will stick in the

ground; and finally, the long downwardly pointing barb actually touches the shank leg,—probably as a result of drying and warping. For these points consult Fig. 85. There is nothing to indicate that this hook was ever used, and from the length and set of the barb, it is not clear how it could be used.

Hook No. 9 from Ontong Java (Fig. 88) is unique in that both legs are curved outward exactly as are the two forks of a boy's catapult. Due to this bowing out, this hook has the greatest width of any true *Ruvettus* hook described in this paper. The barb is very claw-like and is the only one of the kind found in these Melanesian hooks, save on hook No. 7.

No. 10 from Tasman is another heavy limbed hook. The thick base measures 7 inches in circumference and the barb leg 3.25 inches. The actual measurement cannot be given for the base of the shank leg since it has been deeply gnawed by some rodent, but it was apparently about 4 inches in circumference. It lacks the cord of attachment. Its weight is 9.75 ounces. It is an immensely strong hook.

While not the largest, No. 11, also from Tasman, is, with one exception (the Caroline Mortlock hook, Fig. 73), the longest and heaviest true *Ruvettus* hook found in the course of this research. It is shown in Fig. 86. Its long leg is 16.25 inches long; its short one 13.1 inches. These legs are very nearly parallel, the greatest width between them being only 2 inches. In other words, these legs are more nearly parallel and the width between them is relatively and absolutely less than in any known large *Ruvettus* hook. The circumference of the heavy club-like base is 5.5 inches. At the fork, the girth shank leg is 3.5 inches, the barb leg the same. The hook weighs 10.75 ounces. Altogether, it is the largest Melanesian hook, but because its legs are only two inches apart, it has the shortest barb of any. It is made of a very heavy dense wood and little has been done to the limbs other than to remove the bark.<sup>1</sup>

These hooks from the Lord Howe Islands are huge, heavy, crudely made, long limbed, parallel-legged structures, with sharply downward pointing barbs which almost touch the shanks. The lashings for barbs and lines seem rather small and the sennit is coarsely made—in the case of the barbs this is largely offset by the articulated scarf joints, and in case of the shanks by the well-carved shoulders. On the whole, they are powerful hooks, as indeed they must be to take *Ruvettuses* ranging in size from six to nine feet.

<sup>1</sup>No hooks from the Bismarck Archipelago are available, but some account of fishing is given (Stephan and Graebner, 1907). According to these authors, fishing by the natives of New Mecklenburg is carried on chiefly with hooks and spears. However, sharks were taken by snares, the fish being lured to the side of the boat by a rattle. *Ruvettus* hooks are not mentioned.

*Sikaiana or Stewart Island.* From one other of the eastern outlying atolls of the Solomons, *Ruvettus* hooks are known. This atoll is Sikaiana or Stewart Island. It lies about one hundred fifty miles east of the northern end of Malaita, in Long. 160° E., Lat. 8' 20" S., and about three hundred miles southeast of the Lord Howe Group, or about two-thirds of the

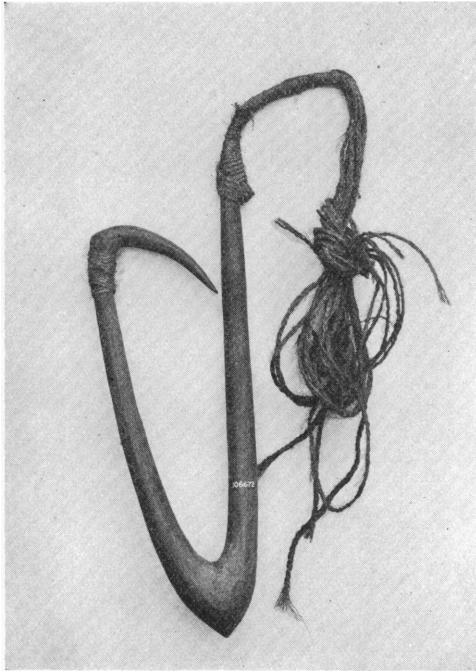


Fig. 87. A *Ruvettus* Hook (13.5 inches long) from Sikaiana (Stewart Island), lying East of Malaita in the Solomons. Courtesy of the Field Museum of Natural History.

distance from this group to the Santa Cruz Islands. In fact, it is the last of the outliers lying to the southeast of the Solomons.

Our first reference to *Ruvettus* at Sikaiana is in a paper by Woodford in 1906. In this he lists from Sikaiana a number of native words, including *Delavena*, the native name for the Castor-oil fish, and in a footnote to this name, he says that this is:—

a fish, from 6 to 9 feet in length, caught at a depth of 200 fathoms. Another smaller fish, called *Palu*, is caught at a depth of 50 fathoms.<sup>1</sup>

<sup>1</sup>Woodford, 1906, 69.

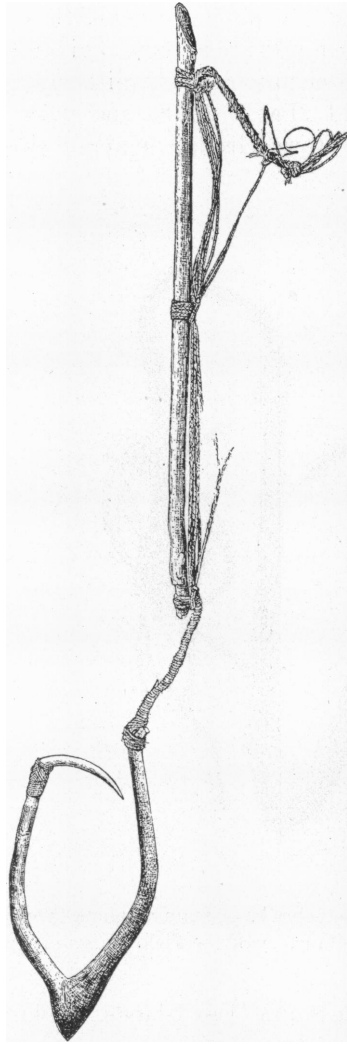


Fig. 88

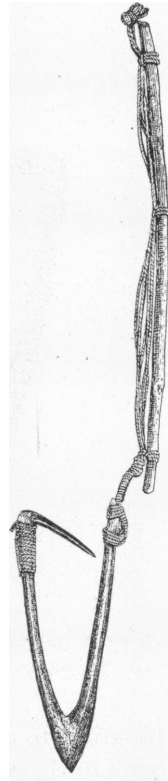


Fig. 89

Fig. 88. [A Remarkable *Ruwetthus* Hook from Ontong Java. Greatest length, 15 inches. Note the great width, due to the bowed legs. Drawn from a photograph by courtesy of the Field Museum of Natural History.

Fig. 89 (80.0-4326). A 10.75-inch *Ruwetthus* Hook said to have come from the Ellice Islands, but undoubtedly of Melanesian Origin.

In a paper published ten years later (1916) Woodford again repeats the facts given above. Such huge fishes called for large hooks, and such the natives use.

The only known hook from Sikaiana is one collected by R. Parkinson and now in the collections of the Field Museum. This is on exhibition and could not be sent me, but a photograph was sent, and is reproduced herein as Fig. 87. As may be seen, this is a well-made *Ruwettus* hook measuring as follows: outside length of shank, 13.5 inches; inside length, 11.75 inches; barb leg outside, 11.75 inches, inside, 9 inches; barb outside, 3.75 inches, inside 3; clearance, 0.12 inch; weight, hook and cord, 9.25 ounces. This hook at present has no float, but that such was originally attached cannot be doubted because all other hooks from this general region have them and more positively because the bundle of cords, seized only a few inches from the top of the hook up and thence loose (untwisted and unseized), is exactly like that on every other hook (save one as noted above) from this general region.

This hook seems rather better finished than most other Melanesian hooks. The cockspur-shaped barb is set on the inside of the tip of the barb leg and behind its heel may be seen the tip of the barb limb serving as a stay. The barb is lashed on by some seventeen turns of flat plaited sennit laid on in criss-cross fashion. In shape and attachment of the top, the barb leg is exactly like other hooks from this general Melanesian region, and calls for no specific description.

*Unknown Melanesian Sources.* When this investigation was fairly under way, correspondence with Mr. Oldman, in London, elicited the information that he had a *Ruwettus* hook and float from the Ellice Group. Now no *Ruwettus* hook with a float had ever been reported from the group, so the hook was ordered. When it came, the first sight showed it was not an Ellice Island hook, and the second that it was from Melanesia. I then wrote Mr. Oldman for the history of this hook and in reply he gave me the data quoted from his letter on pp. 283 and 284.

The dimensions of this specimen are as follows; length of shank leg, 10.75 inches; of barb leg, 10.25 inches; length of barb, 3.25 inches (inside, 2.5); inside width, 2.75 inches; clearance, 0.4 inches; weight of hook and float, 5.5 ounces. This hook and float are portrayed herein as Fig. 89.

In describing this apparatus, it should be said, to begin with, that the body of the hook is smaller but an absolute copy of hook No. 5 from Tasman Island described above from the Field Museum collection. It is made of the same black wood, the barb leg has the same right-hand twist, and the shank leg has the same kind of carved knob and pointed

tip. The differences are that the base of our hook is pointed, that it has a barb set on the right instead of the left side, and that it has a line of attachment and a float fastened to the hook. The barb is loose, but cannot be detached, presumably because of the "chog" joint shown in Fig. 83a. When one moves the barb up and down on the barb leg a slight click can be heard when the "shoulders" of barb and leg strike together. The barb is lashed fast by a crudely made line of flat braided sennit in a double layer, the outer having fourteen turns. The lashing forms a raphe on the front side of the barb leg, and the loose end of the cord is laid flat on this raphe and fastened at top and bottom.

The cord of attachment is composed of six free strands of two-ply twisted long fibered sennit, very modern looking and entirely different (un-Melanesian) from that lashing the barb fast. These free cords are looped fast below the knob on the top of the shank (six turns showing plainly). One cord is then seized around the others, is extended to make four turns around cord and pointed end of shank, and is finally used to seize the cord to the end of the float. The float is 18.25 inches long and 0.5 inch in diameter in the middle. The cord lies on the under side of the float and is composed of six loose strands. Five of these are of two-ply twisted sennit coming from the hook. The other cord is of three-ply flat braided sennit and is used to lash the cord to the float by three turns at each end and two in the middle. From the outer lashing it extends out with the other five cords to end in a knot.

To sum up: this hook is plainly and indubitably a Melanesian hook, and while its absolute source cannot be determined, it is probably from Ontong Java or Tasman.

For the other hook (or rather hooks) referred to we have practically no data, and citation is here included merely for corroboratory purposes. In Foy's (1909) article on the Rautenstrauch-Joest-Museum in Cologne, on p. 33 he figures a cabinet containing "Sammlungen von den mikronesischen Randinseln nordöstlich von Melanesien." At the right bottom corner of this are to be seen two large hooks with floats and lines essentially of the types above shown. These figures are too small for any details to be given, and no locality is indicated, hence one is in doubt as to what are meant by "mikronesischen Randinseln nordöstlich von Melanesien."<sup>1</sup> Presumably reference is made to the very islands lying east and north of the Solomons whose hooks we have been studying.

*Eccentric Ruwettus Hook from Southeast Island in the Louisiades.*  
We now have to consider a hook as widely different from the typical

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<sup>1</sup>Foy, 1909, 33.

Melanesian *Lavenga* hook of the outliers to the east of the Solomons, as are the hooks figured and described on pp. 285 to 293 different from all other Polynesian *Ruwettus* hooks.

My attention was called to this hook by Hedley, who denominates it a *Ruwettus* hook,<sup>1</sup> an opinion in which I hesitatingly agree. Had it come from Polynesia it would have been described in the sub-section "Abnormal Hooks," and that it deserves the appellation may be seen by reference to Fig. 90 which is reproduced from Macgillivray's "Voyage of the Rattlesnake." This hook was obtained while the ship was between Piron and Southeast Island in the Louisiade Archipelago, and consequently is of Melanesian origin. Of this hook, Macgillivray writes:—

We . . . procured a fishing hook of singular construction. . . . It is seven inches in length, made of some hard wood, with an arm four and one half inches long, turning up at a sharp angle, and tipped with a slightly curved barb of tortoise-shell projecting horizontally inwards an inch and a half.<sup>2</sup>

This hook is very crudely made. The fragments of the stem from which it was torn have not even been cut off and the lashings are poorly done. The short loop to receive the fisherman's line is seized fast on the inner right side of the shank leg, and to the inside of the top of the barb leg also is attached the sharply hooked barb made of tortoise shell. This material is rather unusual, but as noted previously is occasionally used for barbs in *Ruwettus* hooks. Also here let it be recalled that Fig. 50, p. 271 shows a small *Ruwettus* hook cut entirely from tortoise shell, coming from an undesignated island.

Hedley, like myself, never saw this hook but he believes that it is a *Ruwettus* hook, though of "an eccentric type," and in the former conclusion I reluctantly agree, since it has all the earmarks of this form of fishhook and is like no other type of fishhook found anywhere else in the South Pacific. Had the base been carefully trimmed, it would resemble a true *Ruwettus* hook much more closely. However, if it is a "Purgier-fisch" hook, it must have been used for taking small specimens.

This hook was deposited in the British Museum and was refigured (sides reversed, i.e., in mirror image) by Edge-Partington.<sup>3</sup> If accepted

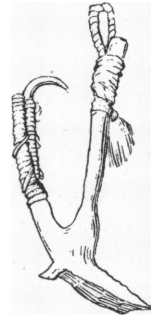


Fig. 90. A *Ruwettus* (?) Hook from Southeast Island in the Louisiades. After Macgillivray, 1852, vol. I, p. 198.

<sup>1</sup>Hedley, 1897a, 273.

<sup>2</sup>Macgillivray, 1852, 198.

<sup>3</sup>Edge-Partington, 1890, vol. I, 307, fig. 2.

it gives us our most definite western locality for *Ruwettus*. For a possible indefinite one see p. 280. Furthermore, it should be noted at this point that here is another oilfish hook obtained off a high island, for Southeast or Tagula Island is 2689 feet high, confirming the conjecture set forth on p. 277 as to the presence of the fish off such islands.

*Size of Melanesian Ruwettus Hooks and Ruwettus Fish.* It is interesting to note that, excepting the small hook collected by Macgillivray and doubtfully assigned as a *Ruwettus* hook, all the hooks from Melanesia—from the Marcken Islands, from Nissan (Sir Chas. Hardy Group), from Nuguria (Abgarris Islands), from Tasman and Ontong Java (Lord Howe Group), and from Sikaiana—from the outlying atolls stretching nearly seven hundred miles northwest-southeast off the eastward side of the Bismarcks and Solomons—all these are huge hooks of the same uniform pattern and many of them almost identical. They are all uniformly very large hooks made of heavy wood, all have barbs of the same pattern, all have shank tops alike, all have floats of the same type in form and manner of lashing (in fact, many of them are almost identical). These things bespeak a community of ideas and of ways and means and probably of ancestry and communication.

As to the size of the Melanesian *Ruwettus* fish which require such huge hooks (the smallest is 7.9 inches over the shank leg, the largest 16.75 inches), one for long could only conjecture. But reasoning by analogy from the great size of the hooks, everyone was persuaded that these fishes must be giants far larger, heavier, and more active than their kindred in the central and eastern Pacific—as Hedley first conjectured. In this connection, it may be recalled that Parkinson says that at Tasman

Fishing for *Ruwettus* is a very favorite sport, for it not only requires the utmost expertness in sailing and steering, but is also extremely dangerous. A boy is considered to have reached manhood when he is allowed to take part in these fishing expeditions at night.<sup>1</sup>

However, we are no longer left to conjecture and to reasoning from analogy, for Woodford has effectually settled the matter by declaring that the huge hooks in all the islands named (with which he was extremely well acquainted) were used for taking a huge form of *Ruwettus* called *Lavenga*, ranging in size from a fathom to a fathom and a half (6–9 ft.).<sup>2</sup> Such huge specimens of *Ruwettus* are not known from any other parts of the world and one is left to wonder if they belong to a new species.

<sup>1</sup>Parkinson, 1907, 536.

<sup>2</sup>Woodford, 1916, 34.

## HOW *RUVETTUS* IS CAUGHT ON ITS PECULIAR WOODEN HOOK

In explaining the actual use of the *Ruvettus* fishing apparatus I am at great disadvantage. I have, of course, never seen the hook in operation and hence have to rely almost entirely on the published descriptions—all of which are very fragmentary and equally very unsatisfactory. However, certain points are fairly clear and with these the explanation will begin.

The fish is caught in water from eighty to four hundred fathoms deep (480–2400 feet) and, as the hook is of wood, even with the bait attached it would be too light to sink readily in the dense tropical sea water. Furthermore, it must sink quickly, otherwise the bait would be taken by the abundant surface-living fishes (including sharks) before it had descended many yards, or it would be drifted away by the perennially abounding currents. In any case a sinker must be used. Becke says:—

A stone sinker, 3 to 5 lbs. is attached to the line.<sup>1</sup>

Further, he tells us that in the Ellice Islands:—

To sink the line, coral stones of three or four pounds weight are used, attached by a very thin piece of cinnet or bark, which, when the fish is struck, is always broken by its struggles, and falls off, thus releasing the line from an unnecessary weight. It is no light task hauling in a thick, heavy line, hanging straight up and down for a length of from seventy-five to a hundred fathoms or more [with a 6 ft. *Ruvettus* struggling at the end of it.]<sup>2</sup>

Earlier in this paper (p. 279) an illustration (Fig. 59) has been copied and described from Edge-Partington<sup>3</sup> in which a permanent sinker is attached to the line of a hook from Niue. On p. 281 is shown Etheridge's figure (my Fig. 60) of two hooks also from Niue<sup>4</sup> with a sinker attached in a very substantial way. Finally, the gang of Niue hooks with a sinker held in a meshwork of cords, the whole apparatus being in the Bishop Museum, is shown in Fig. 61. These hooks are all from Polynesia. In Micronesia, there is but one portrayal of a hook with a sinker, and that is Hambruch's from Nauru, shown herein as Fig. 71. He notes that:—

. . . . the line with the sinker becomes anchored in the debris of the [coral] rocks, while the hook line is held suspended.<sup>5</sup>

Krämer gives us no figure but incidentally refers to the use of a stone as a sinker in the Gilberts.<sup>6</sup>

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<sup>1</sup>In Waite, 1897, 200.

<sup>2</sup>Becke, 1901, 149.

<sup>3</sup>Edge-Partington, 1895, vol. II, pl. 39, fig. 4.

<sup>4</sup>Etheridge, 1899, pl. 36.

<sup>5</sup>Hambruch, 1915, fig. 215.

<sup>6</sup>Krämer, 1906, 258.

However, in Melanesia, the use of the sinker seems the rule. In Fig. 82 is shown a hook from Nukumanu (Tasman Island) which has a sinker very securely attached. How widespread the use of this permanent sinker is cannot be said, especially for Polynesia and Micronesia, but in Melanesia one gets the impression that it is widely used. At any rate Parkinson figures and describes it<sup>1</sup> (see p. 313) in such a way as to lead to this conclusion.

The second accessory part of the *Ruvettus* fishing apparatus is the stick or float. This seems indeed such an unessential accessory that in Polynesia and Eastern Micronesia it is practically absent, while in Melanesia and those islands of Micronesia (the Northern Mortlocks), it seems the rule. The facts as to its occurrence and use will now be set forth.

Our knowledge of the distribution or occurrence of the stick or float is more or less imperfect, but when we come to study its use we are quite at sea. Becke, whose experience with the Palu fish was more extensive than anyone who has written of it, makes absolutely no mention of the stick. However, figures of it are occasionally found. In Polynesia it is found at Niue, as witness the figure (Fig. 58 herein) by Edge-Partington<sup>2</sup>. And as has just been seen in the other figures of hooks from this island, floats as well as sinkers, seem to be the rule for Niue hooks. In Micronesia, as Hedley has been quoted<sup>3</sup> and as the data from the Australian Museum corroborate, the hooks from the Mortlock Group of the Carolines all seem to have been provided with floats (see Fig. 72). And finally, all the Melanesian hooks are, or have been, provided with sticks.

As to the function of the stick, Mr. L. L. Mowbray of the New York Aquarium, who has had a wide experience in fishing for sharks, suggests that the stick was intended to protect the line from the teeth of sharks when such are caught on this hook. This idea is also to be found in the notes from the Australian Museum which speak of the float as "a line-protecting stick." Further Thilenius records the hook from Nukumanu as having the wooden protection or reinforcement and adds that:—

The wooden strip is to prevent the line from being torn by the fish.<sup>4</sup>

And just here there must be recalled Becke's statement that when hooked the fish tries to force

. . . his body into a cleft or chasm of [coral] rock, and let the hook be torn from his jaws.<sup>5</sup>

<sup>1</sup>Parkinson, 1907, 536.

<sup>2</sup>Edge-Partington, 1890, vol. I, pl. 67, fig. 6.

<sup>3</sup>Hedley, 1897a, 276.

<sup>4</sup>Thilenius, 1920, 631.

<sup>5</sup>Becke, 1901, 151.

Here the stick would help materially in protecting the line from the cutting action of the sharp coral rocks. But after all this can hardly be the primary function of the stick. However, Robert Parkinson sets the matter clear when he says that the sinker holds the stick in a horizontal position in the water, so that the hook fastened to it hangs free.<sup>1</sup>

His figure of the apparatus is shown in Fig. 82.

As I have noted elsewhere, the sinker carries the apparatus to the bottom, the stick floats clear of the broken coral and thus keeps the hook from becoming entangled and hence often lost. But how does the hook hang? Parkinson indicates that it hangs perpendicularly from a horizontal float. To determine the matter, I took our hook and float to the New York Aquarium and tried it in a large salt water (density 1,002) tank about four feet deep. Thrown in this, hook and stick floated at the surface. Next the hook was loaded with a fifteen inch herring (weighing 11 ounces) split open and lashed flesh sides out on the barb leg. Thrown in, this slowly sank until the hook rested on the bottom, the float inclined at about an angle of 30° to the horizontal, the hook at about 45°. Next a lead weight was affixed about three feet from the outer end of the stick. The whole sank quickly, but came to rest in about the same positions as noted. However, if the sinker is attached to the main line and the float and hook placed sufficiently high above this, as is shown in Etheridge's figure<sup>2</sup> (Fig. 60 herein), the float and hook will certainly stand clear of the broken coral.

Now, as to the action of the hook itself. Everyone who has looked at these hooks has wondered how any fish could be caught on a hook so shaped and with the barb so closely approaching the shank. Certain it is that if *Ruvettus* swallowed the *whole* hook, he could never be caught on it. But this is just the thing that *Ruvettus* does not do. The standard bait used by the Polynesians is a flying fish, split open and lashed securely on the right-left sides of the top of the barb leg. Fig. 32 shows an Ellice hook with a cord provided for the purpose. However, Becke at Peru (Caroline Group) in 1882 successfully used as bait, gars, mullets, or young bonito (all silvery colored fish), or even the tentacle of an octopus with the skin removed.<sup>3</sup> While Krämer found that at Maraki in the Gilberts, a fish bearing the native name of *Dentaritari*, a not distant relative of the Palu, was used exclusively.<sup>4</sup>

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<sup>1</sup>Parkinson, 1907, 536.

<sup>2</sup>Etheridge, 1899, pl. 36.

<sup>3</sup>Becke, 1901, 152.

<sup>4</sup>Krämer, 1901, 181; 1906, 258.

And finally, this fishing must be done on windless and moonless nights. Becke writes that he tried many times both on a waning and waxing moon but that he never succeeded in catching a *Ruvettus* save on quiet nights in the period of absolutely dark moon.<sup>1</sup>

As to the actual manner in which the fish is hooked, Hedley (1897a) quotes Mr. Jack O'Brien, a trader living at that time on Funafuti that in bolting this [bait tied over the barb] the *Palu*, whose jaws are very thin and pliable gets the barb caught behind the angle of the jaw.<sup>2</sup>

Krämer, from information gained many years before, says that when *Ruvettus*

gets a corner of his mouth between the barb and the shank, he is held fast and allows himself to be drawn up.<sup>3</sup>

However, our most definite information comes from Gardiner who describes the *fe* or "shark-hook" as grown at Rotuma in a curved form.

The hook was then shaped, and a piece of hard wood spliced on as a barb projecting inwards.<sup>4</sup>

This was certainly the form of hook which in this paper has been designated as of the intermediate type, having the shark hook round base and the *Ruvettus* hook barb. This hook is apparently identical with that described by Becke as used at Nanomanga, Ellice Island for taking *Ruvettus*. Let us hear him:—

The hook is made of wood—in fact the same as is used for shark fishing—about an inch and a half in diameter, fourteen inches in the shank, with a natural curve; the barb . . . being supplied by a small piece lashed horizontally across the top at the end of the curve.

However, Seurat definitely assures us that in the Paumotu this identical form of hook (see Fig. 30) was used for taking both sharks and *Ruvettus*.<sup>6</sup>

Gardiner describes the actual hooking of the fish as follows:—

The bait was tied on over the barb; the fish working at this, as the wood was springy, gradually got its jaw between the barb and the stem. On being struck the barb caught in the gills and the fish was hauled up sideways.<sup>7</sup>

This clarifies the matter considerably, but seeking further information I wrote Professor Gardiner, who kindly answered that the hook in question was of the same shape as that from the Ellice Islands (compare Becke above) and all the islands to the north. Now the islands to the north are the Gilberts. From them have been described, among the

<sup>1</sup>Becke, 1901, 154.

<sup>2</sup>Hedley, 1897a, 276.

<sup>3</sup>Krämer, 1906, 258.

<sup>4</sup>Gardiner, 1898, 425.

<sup>5</sup>Becke, 1901, 149.

<sup>6</sup>Seurat, 1905, 297.

<sup>7</sup>Gardiner, 1898, 425.

intermediate hooks, certain large U-shaped hooks with *Ruvettus* barbs. For these see Figs. 24 and 25. Gardiner did not see *Ruvettus* caught at Rotuma but writes that he believes that "it undoubtedly occurs" there.

Until my experiments in the large tank at the New York Aquarium, I had had the idea that the hook suspended to the float would hang vertically in the water as shown in Parkinson's figure<sup>1</sup> (Fig. 82 herein), in which case the fish would have to stand on his head, so to speak, while working to get his mouth over the barb leg. However, since the hook floats in a position varying from the horizontal to an angle of 30°-50°, it would seem that the fish, in bolting the bait, remains in what at any rate approaches its normal position. In any case the manner of getting the barb leg into the mouth of the fish seems surely a very awkward one, but the vast distribution of the hook attests its efficiency in taking *Ruvettus* over the whole central Pacific Ocean.

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<sup>1</sup>Parkinson, 1907, 537.

## USE OF STEEL HOOKS FOR TAKING *RUWETTUS*

Before concluding this paper it seems well to answer the question which has certainly arisen in the reader's mind as to whether *Ruwettus* can be taken on hooks other than these peculiar wooden ones with their extraordinarily shaped and placed barbs. The answer for the Atlantic is that *Ruwettus* is certainly so taken in the Mediterranean, on the shores of Spain, at Madeira, off the Canaries, in Cuban waters, at Bermuda, and on the Grand Banks of Newfoundland.

Before answering this question for the Pacific, let us review the situation. As has already been pointed out, large true *Ruwettus* hooks are, in all probability, used for taking sharks as well as oilfish. The intermediate form of hook, having the round bottom of the true shark hook and the more or less horizontally placed true *Ruwettus* barb, is undoubtedly used for taking both kinds of fish. And finally, we have the normal round-bottomed shark hook with barbs varying in position from one continuing the curve of the hook (see Fig. 15), to those having the barb incurved at a sharp angle toward the top of the shank, as shown in Fig. 17. On such a hook I have no doubt that *Ruwettus* can be and is often taken.

If *Ruwettus* can be taken on such a wooden hook it is logical to think that it can be taken on steel hooks. On this point the natives of the Pacific Islands have in the past entered a strong negative, citing the fact that the bones of this fish are very soft and alleging the belief that steel hooks would readily tear out before these strong and active fishes could be drawn the long distance to the surface. In this matter we must again turn to Becke. In his 1897 account, he speaks of catching Palu at Niue or Savage Island "with a steel fish hook."<sup>1</sup> Again he says that at Nanomanga, Ellice Islands, he caught Palu with flatted Kirby hooks five inches long and as thick as a lead pencil attached to wire leaders.<sup>2</sup> Becke further speaks of catching *Ruwettus* off various atolls and the presumption is that he used steel hooks. However, he later specifically writes that in fishing for Palu he generally used 7-inch steel hooks on American 27-thread cotton lines, and that, so provided, he was usually the first man to pull in a Palu and that he not infrequently broke the local records in a night's fishing.<sup>3</sup> Hence the answer is that the *Ruwettus* of the Pacific can be and is successfully taken on steel hooks. How it is taken at Honolulu, Tokio, and in the Banda Sea cannot be stated, but it is presumably with steel hooks.

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<sup>1</sup>Becke, 1897, 201.

<sup>2</sup>Becke, 1901, 151.

<sup>3</sup>Becke, 1909, 97.

In the South Seas *Ruvettus* was taken on wooden hooks because there was no other material available with which to make hooks strong enough to take such large and active fishes. Nowadays, however, when the old men, who had the skill and knack of making these hooks, are gone or are fast passing, and when small shark hooks, clearly available for taking *Ruvettus* as well as sharks, can be purchased from every trader, it is greatly to be feared that these interesting wooden hooks will soon become extinct, save for the few specimens preserved in ethnological collections, and those made by enterprising natives to supply the tourist trade.

#### DISTRIBUTION OF THE *RUVETTUS* HOOK

In working up the facts as to the distribution of this curious and interesting hook, our positive data are of course based on actual collections. There are, however, to be taken into consideration certain data pertaining to the islands where *Ruvettus* is taken but the kind of hook not indicated, since presumably the *Ruvettus* hook is or was there used also. These accounts have been noted separately in the body of this article and these data as a basis for the distribution of the hook will be handled likewise in this section.

The most easterly point at which *Ruvettus* hooks have been collected is Fagatau (Angatau, Ahangatau) Island in the Paumotu or Low archipelago,<sup>1</sup> longitude 140° 52' W. The most westerly is Nissan (Sir Charles Hardy Group) northwest of Bougainville of the Solomons, longitude 154° 10' E. This gives an east-west range of 64° 58', or in round numbers 65°. Fagatau lies about in latitude 16° S. and Nissan in about 4° 30' S. The average is about 10° S. and on this parallel the value of a degree in miles is 68.13. Hence the east-west range of the *Ruvettus* hook is the enormous distance of 4430 miles. However, it must be remembered that Edge-Partington figures a hook<sup>2</sup> (Fig. 59) among a number of specimens from Niue (Savage Island), but doubtfully marks it "[Labelled New Guinea]." As stated before (see p. 281) my own opinion is that this hook is from Niue, but for argument's sake we will hold it to be correctly labelled. From just what part of New Guinea this hook possibly came cannot be ascertained, but we will take the southeast extremity (that nearest the Louisiades) which lies in about longitude 150° 10' E. and about in latitude 10° S. This then increases our longitude by 3° or to 69°, and our miles to about 4630.

The recorded north-south distribution reaches from the Mortlock Group in the Carolines in 5° 30' N. latitude to New Zealand.<sup>3</sup> Now no

<sup>1</sup>Seurat, 1905, 296.

<sup>2</sup>Edge-Partington, 1895, vol. II, pl. 39, fig. 4.

<sup>3</sup>Edge-Partington, 1895, vol. II, pl. 39, fig. 4.

locality in New Zealand is indicated, but presumably it is found around the northern half, so we will take for purposes of computation, the parallel of  $40^{\circ}$  S. as a base line since it divides New Zealand approximately into halves. Our north-south distribution then covers  $45^{\circ} 30'$  of latitude, and taking a degree as averaging 68.8 miles for the given range of latitude, this amounts to 3130 miles.

In this vast boundary of the south-central Pacific Ocean, a region 4430 miles east and west and 3130 north and south, we find that the *Ruvettus* hook has been used and collected at the Paumotu, the Societies, the Australs, the Hervey Group, Niue, Tonga, Samoa, the Tokelau or Union Group, Fiji, Ellice Islands, the Gilberts, Nauru, Marshall Group, the Mortlock Group of the Carolines, the Marcken or Southern Mortlock Islands, Nissan, Nuguria, Buka, Ontong Java and Tasman, Sikaiana, the Louisiades, New Zealand, and possibly from the Solomons and New Guinea. Furthermore, Frank Burnett<sup>1</sup> reports the capture of the oilfish at Washington Island, near Fanning Island, and Louis Becke<sup>2</sup> says that the Palu is taken at Pukapuka (Danger) Island, at Manahiki (Humphrey) Island and at Suwarrow. Elsewhere<sup>3</sup> he speaks of fishing for the Palu in the Carolines and Marshalls and at Kusaie or Strong's Island. Furthermore, Becke in his various books speaks of taking *Ruvettus* at a number of groups and individual islands from which hooks have been figured and described. And finally Krämer reports its capture at Makin in the extreme north of the Gilberts.<sup>4</sup>

In regions out of the South Seas proper, *Ruvettus* has also been taken at Honolulu, where it is called "Walu" by another branch of the Polynesian peoples. I have not succeeded in ascertaining what kind of hook is or was used for catching it there, where it is very scarce. Dr. Ball writes of the Hawaiian *Ruvettus* as follows:—

That the Hawaiians ever caught *Ruvettus* we are not sure, but we infer that they did so. They fished in deep water and would have highly valued such a fish. Mr. Thompson has watched the markets daily for the last 24 years and doubts if he has seen this species more than 4 times. . . . However, I have found one man who says the Hawaiians used live fish as bait for *Walu*, but no one here has any knowledge of such a hook used here as Hedley, Waite, and you figure for the south.

The fish is also reported from the market at Tokio<sup>5</sup> but no statement is given as to how it is taken. A deep sea fish, it must be taken on a hook, but there are no data to be found as to what kind of hook.

<sup>1</sup>Burnett, Frank. *Through Tropic Seas*, London, 1910, 61.

<sup>2</sup>In Waite, 1897, 199.

<sup>3</sup>Becke, 1901, 156; 1905, 128.

<sup>4</sup>Krämer, 1901, 182.

<sup>5</sup>Steindachner and Doderlein, "Beiträge zur Kenntniss der Fische Japans, (II)," (*Denkschriften Akademie Wissenschaften Wien*, 1884, *Math.-Natur. Classe*, Bd. 48, p. 37).

Lastly Weber<sup>1</sup> took it at a depth of + 250 meters in the Banda Sea, presumably on a steel hook. He says that the natives prize it highly and fish for it, but apparently he did not know with what kind of hook.

However, the details of distribution are fully presented in the tabulations which also show the relative number of hooks from each locality and from which the wide distribution for each variety of hook discussed in the preceding pages can be visualized by the reader.

## POLYNESIA

Island or Group	Shark	Doubtful Shark	Intermediate	Ruvettus	Abnormal Ruvettus	Totals
Polynesia				8		8
Austral Group						
Tubuai				2		2
Ellice Group			1	1		2
Funafuti				5		5
Nanumea				1		1
Nukufetau	1					1
Nukulaelae				2		2
Fiji Islands	1					1
Hervey Group				1		1
Mangaia	1					1
Rarotonga	1					1
Hawaii	5		1			6
New Zealand	4			1		5
Niue				9		9
Paumotus						
Fagatau			1			1
Kakahina				1		1
Rotuma Island			1			1
Samoa Group				2		2
Manu'a				1		1
Tahiti Group	2		3	6	1	12
Tonga Group				6		6
Tongareva	4					4
Union Group				2		2
Bowditch				7	3	10
Totals	19		7	55	4	85

<sup>1</sup>Weber, "Die Fische der Siboga Expedition" (*Siboga-Expeditie*, 1913, no. 57, 401-404)

MELANESIA

Island or Group	Shark	Doubtful Shark	Intermediate	Ruvettus	Abnormal Ruvettus	Totals
Melanesia				3		3
Faed Group						
Nuguria Atoll				1		1
Lord Howe Group						
Tasman				6		6
Ontong Java				13		13
Louisiades Group						
Southeast Island					1	1
Marcken Group						
Southern Mortlocks				4		4
New Guinea						
Milne Bay		2				2
Sir Charles Hardy Gr.						
Nissan				1		1
Solomon Islands						
Buka				1		1
Sikaiana				1		1
Trobriand Group						
Trobriand		1				1
Woodlark		1				1
Totals		4		30	1	35

# MICRONESIA

Island or Group	Shark	Doubtful Shark	Intermediate	Ruvettus	Abnormal Ruvettus	Totals
Caroline Group						
Mortlock				10		10
Gilbert Group			4	6	2	12
Maraki		2	4			6
Tamana					1	1
Tarowa				1		1
Marshall Group				1		1
Nauru or Pleasant Island				2		2
Totals		2	8	20	3	33

# SUMMARY

	Shark	Doubtful Shark	Intermediate	Ruvettus	Abnormal Ruvettus	Totals
Melanesia		4		30	1	35
Micronesia		2	8	20	3	33
Polynesia	6	19	7	49	4	85
Totals	6	25	15	99	8	153

## THE HALIBUT HOOK OF ALASKA

The halibut hook of Alaska and the Northwest Coast of North America so markedly resembles the *Ruvettus* hook of Oceanica, that I have thought it well to figure and describe the two types of these hooks for comparison with *Ruvettus* hooks. Halibut hooks are of many kinds but are of two types: the first is U-shaped like the shark hooks and the intermediate type of hooks previously described in this paper; the second is V-shaped like our true *Ruvettus* hooks.

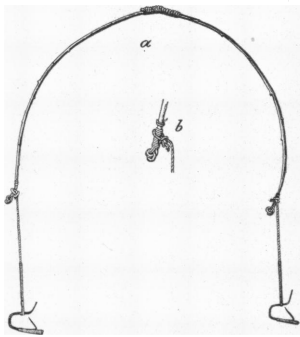


Fig. 91. Two Round-Bottomed Halibut Hooks from the Kwakiutl, showing how they are set in Pairs attached to a Float. After Goddard, 1924, p. 62.

The first type of hook, the round-bottomed U-shaped hook, is made by steaming and bending pieces of selected wood or by finding a wide fork and still further rounding it out. Such hooks are frequently used in pairs attached at either end of a stick which serves as a float. The line is attached to the center of the float and only one sinker is required for two hooks. Two round based hooks making such a pair are shown in Fig. 91, copied from Goddard.<sup>1</sup> Here also the line is so attached to the shank leg that the hook hangs in a horizontal and not a vertical position. Furthermore, the barb leg is noticeably larger and heavier than the shank leg. The barb, originally made of bone, but nowadays commonly of iron, is lashed on

the top of the barb leg so as to point obliquely inward and downward and when at rest the barb leg comes to rest parallel to the bottom and in easy position for swallowing by the halibut.

Taking up the V-shaped hook next, we find two kinds. The first of these is made by taking two heavy pieces of wood with their inner edges bevelled so as to fit, making a V. These pieces are then lashed fast at the point of the V and to one of the legs a barb is attached as previously noted. As shown in Fig. 92, the other V-shaped hook is made of a fork split off the main stem with the barb leg made of the main stem as was found in many *Ruvettus* hooks. Lashed on one side of the top of the barb leg is the barb (made of bone formerly, but now generally of iron) pointing sharply inward and downwards towards the shank leg. This is not a

<sup>1</sup>Goddard, 1924, 62.

barb made of a fork as in *Ruvettus* hooks with one leg for attachment by a scarf joint to the top of the barb leg and the other free and serving as the barb to the hook, but is simply a straight spike lashed generally on to one side of the top of the barb leg. Sometimes, however, it is set on the inner top surface of the barb leg, which is carved into a sloping surface to let the barb lie flat on it.

The shank leg is always made of the branch and has the line attached some distance below the tip, generally about half way. On the line some distance above its attachment to the hook, there is made fast a wooden float generally carved roughly in imitation of a duck. This float keeps the line clear of the bottom and prevents fouling. And finally, since halibut fishing is carried on in water twenty or more fathoms deep, there is a stone sinker to bring the apparatus to the bottom. However, it would be a nuisance to haul up a heavy sinker as well as a struggling halibut weighing from fifty to three hundred fifty pounds, so this sinker is left behind by an ingenious device. The line is wrapped tightly around the

stone in two or three turns and a bight or loop of the free line is tucked under one of the turns just as is done in disposing of the ends of the halliards of a flag. When the fish bites, the fisherman pulls the loop of his line out from under one of the turns, the stone is set free and falls to the bottom relieving the line of that much dead weight.

It will be noticed that the hook shown in Fig. 92 has the under surface of the barb leg broad, flat, and heavier than the shank leg. This causes it to float near the bottom with the heavy barb leg parallel to the bottom. But even in those cases where there is not so much disparity in size between barb and shank legs, the barb leg is still somewhat larger than the other, and this plus the weight of barb and bait makes it come to rest below the shank leg, while its horizontal position is of course due to the point of attachment of the line. The bait is firmly lashed onto the

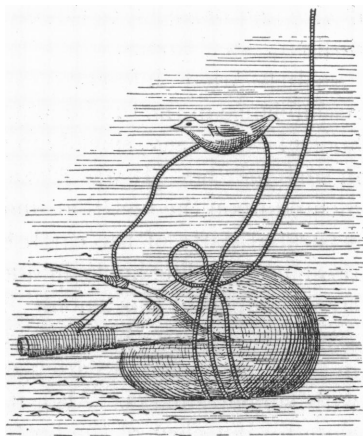


Fig. 92. Halibut Hook, Float, Sinker, and Line, from Alaska. The hook is made of a fork, the main stem bearing the barb. The sinker carries the whole to the bottom. The hook rests on the flat under surface of the barb leg and the float keeps the line from fouling. After Niblack, 1890, pl. XXX, fig. 151.

shank leg between the barb and the basal fork. When the halibut comes along, his mouth (placed vertically, not horizontally as in other fishes) finds no trouble in enclosing barb and bait—the springy shank leg helping to drive the barb into the fish's jaw. This is a very effective fishing device and one even to this day preferred by many of the natives to our ordinary steel hooks.

Just what inferences are to be drawn from the remarkable resemblance in the fundamentals of construction in *Ruwettus* and halibut hooks I cannot say, since I am not an ethnologist and hence am untrained in such matters. It was Alexander Humboldt, I believe, who once commented upon the fact that under stress of similar needs people in widely separated parts of the earth had evolved similar apparatuses to meet those needs. The hooks in question possibly may be considered illustrative examples of this axiom. The two kinds of hooks are very similar in general make-up; they are made from forked limbs; have barbs similar in shape and position; are used at considerable depths and are provided with similar sinkers. Also, it being necessary to have the hooks float close to, but clear of the bottom, they are provided with floats for that purpose. Whether or not these things indicate a kinship in origin of their makers, or whether they are an illustration of Humboldt's axiom, I leave to the ethnologists to say. I consider that my function has been fulfilled in bringing these curious and interesting facts together.

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