

# MAT AND BASKET WEAVING

OF THE

## ANCIENT HAWAIIANS

DESCRIBED AND COMPARED WITH THE BASKETRY OF THE OTHER  
PACIFIC ISLANDERS.

BY WILLIAM T. BRIGHAM, A.M., Sc.D. (Columbia).

WITH AN ACCOUNT OF HAWAIIAN NETS AND NETTINGS

BY JOHN F. G. STOKES

CURATOR OF POLYNESIAN ETHNOLOGY IN THE MUSEUM.



MEMOIRS OF THE BERNICE PAUHI BISHOP MUSEUM

Volume II, Number 1

---

HONOLULU  
BISHOP MUSEUM PRESS

1906

# LIST OF PLATES.

- |  |   |
|--|---|
| <p>I. Micronesian baskets.<br/>         II. Micronesian baskets.<br/>         III. Hawaiian sandals.<br/>         IV. Hawaiian fish baskets or traps.<br/>         V. Corner of Pandanus leaf mat.<br/>         VI. Illustrations of plait in hinai poepoe.<br/>         VII. Cover of ieie basket.<br/>         VIII. Basket covering of a gourd.</p> | <p>IX. Hinai poepoe.<br/>         X. Beginning of a makaloa mat.<br/>         XI. Portion of a Niihau or makaloa mat.<br/>         XII. Portion of a Niihau or makaloa mat.<br/>         XIII. Portion of a Niihau or makaloa mat.<br/>         XIV. Group of Hawaiian fans.<br/>         XV. Native scraping oloná. (Cast from life.)<br/>         XVI. Makaloa mat, in color. (Frontispiece.)</p> |
|--|---|

# ILLUSTRATIONS.

## MATS AND BASKETS.

	PAGE		PAGE
1. Coconut leaf basket	3	36. Baskets from the Pelew Islands	27
2. Hawaiian ki leaf basket	4	37. Pandanus grove in Puna, Hawaii	28
3. Coconut leaf baskets from Tutuila	5	38. Rolls of Pandanus leaves	29
4. Coconut basket from Shortland Island	6	39. Pandanus hats from the Carolines	30
5. Palm basket from Ponape	7	40. Pandanus mat from Ebon	31
6. Coco leaf basket from the Carolines	7	41. Large Ebon mat	32
7. Closure of basket bottom	7	42. Mat beds from Caroline Islands	33
8. Fans from the Solomon Islands	8	43. Structure of Caroline mat	33
9. Hawaiian coco leaf fans	9	44. Hawaiian pillows	34
10. Hawaiian fans in the British Museum	10	45. Hawaiian Pandanus baskets	35
11. Ancient Hawaiian fan, Bishop Museum	11	46. Hawaiian covered Pandanus baskets	36
12. Various fans	12	47. Samoan round baskets	37
13. Samoan fans	12	48. Samoan square baskets	38
14. Enlarged fans to show structure	13	49. Marshall Islands mat, folded	43
15. Fijian palm leaf fans	14	50. Lap board and strips of mat sail	46
16. Marshall Islands fans	15	51. Pandanus satchel, Fiji	48
19. Caroline Islands basket	16	52. Marshall Islands mat	49
20. Course of strips	16	53. Group of Marshall Islands mats	50
21. Solomon Islands shields	17	54. Mallets for beating Pandanus leaves	51
22. Rattan shields from the Solomon Islands	18	55. The beginning of a Pandanus mat	54
23. Coco fibre armor, Gilbert Islands	19	56. Women's dresses from Malekula, N. Hebrides	56
24. End of sennit basket from Ponape	20	57. Fijian coffin-shaped basket	57
25. Rolls of sennit	21	58. Freycinetia leaves	60
26. Tongan basket in British Museum	22	59. Freycinetia rootlets	60
27. Open work mats from Tonga	22	60. Basket of ieie	61
28. Coco cords from Micronesia	22	61. Edge of basket	63
29. Palm leaf hats from Guam, Marianas	23	62. Hinai poepoe	64
30. Basket of palm leaf, Solomon Islands	24	63. Mouth of hinai poepoe	65
31. Bottom of basket of palm leaf, Solomon Ids.	24	64. Bottom of basket	66
32. Inside of basket of palm leaf, Solomon Ids.	25	65. Hinai poepoe	67
33. Basket from New Hebrides	25	66. Group of flat-topped Hawaiian baskets	68
34. Baskets from Florida, Solomon Islands	26	67. Rim of basket	68
35. Baskets from Santa Cruz	27	68. Hawaiian fish basket	69

*List of Illustrations.*

	PAGE		PAGE
69. Enlarged portion of fish basket .....	70	85. Solomon Islands comb .....	85
70. Wicker work helmet .....	71	86. Baskets from Northern Australia ...	86
71. Helmet of ieie .....	71	87. Coiled baskets in the Australian Museum ..	87
72. Hawaiian fern-stem hat ..	72	88. Coiled baskets from Gippsland .....	88
73. Modern Japanese fern-stem basket ..	73	89. Australian baskets ..	89
74. New Zealand fish baskets ..	74	90. Decorated dilly basket ..	90
75. Hawaiian fern-stem fish traps .....	75	91. Plain dilly basket ..	90
76. Plan of sandal .....	76	92. Keke of harakake fibre ...	91
77. Niihau makaloa mat .....	78	93. Maori satchels ...	92
78. Keekec pattern .....	79	94. Maori basket satchel ...	93
79. Olowahia and kahanu patterns .....	80	95. Ie sina, Samoa .....	94
80. Puakala, papaula and humuniki patterns....	81	96. Loom from Caroline Islands .....	96
81. Mat patterns .....	82	97. Mats of banana fibre, Caroline Islands ..	99
82. Mat belonging to Kamehameha I .....	83	98. Frame for tol weaving .....	100
83. Mat designs .....	83	99. Tol of complicated pattern ...	101
84. Grass mat .....	84	100. Aprons and tols ...	103

## NETS AND NETTINGS.

	PAGE		PAGE
101. Mesh gauges .....	106	133. Piko O, Hanai D .....	131
102. Shuttles .....	107	134. Hanai A+B .....	132
103. Net menders ..	108	135. Hanai B .....	132
104-5. Koko with umeke .....	113	136. Hanai C, Piko D .....	133
106. Huewai .....	114	137. Hanai D .....	133
107. Olowai ...	114	138. Hanai E .....	134
108. Koko puupuun .....	115	139. Hanai F .....	135
109. Native with auamo ..	116	140-1. Hanai G .....	135
110-11. Piko A, Hanai C ..	117	142-3. Hanai H .....	136
112. Piko B, Hanai B ..	118	144. Hanai H+J .....	136
113. Hanai D .....	119	145. Hanai J .....	137
114. Piko C, Hanai A .....	119	146. Hanai K .....	137
115. Hanai F .....	119	147. Hanai L .....	138
116. Piko D ..	120	148. Hanai M .....	140
117. Piko E .....	120	149. Foreign bag .....	141
118. Piko E, Hanai A .....	120	150. Technique of foreign knot .....	142
119. Piko F .....	121	151. Hanai of plain knitting .....	142
120. Piko F, obverse .....	122	152. Samples of koko .....	143
121. Piko F, reverse .....	123	153. End of auamo, showing pu uo .....	144
122. Piko F .....	124	154. Detail of aha hawele .....	147
123. Piko G .....	125	155. Huewai pueo with aha hawele .....	148
124. Piko H .....	126	156-7. Huewai with aha hawele .....	149
125. Piko J .....	126	158-9. Ipu lei .....	150
126. Piko J .....	127	160. Poho aho, with cords .....	151
127. Piko K .....	128	161. Huewai with cord handles .....	151
128. Piko L .....	128	162. Gourd umeke with cords .....	151
129. Piko M .....	129	163. Commencement of a net .....	153
130. Piko N .....	129	164. Sample of .4 inch mesh .....	159
131. Piko N, Hanai G .....	130	165. Diagram of upena nae kuku .....	161
132. Piko O .....	131	166. Hano ohua .....	162



MAKALOA MAT.



*Mat and Basket Weaving of the old Hawaiians, with illustrations of similar work from other parts of the Pacific.* By WILLIAM T. BRIGHAM, Director of the Bernice Pauahi Bishop Museum.

---

IN this essay I shall endeavor to show the Mat and Basket Work of the Hawaiians, carrying the study of the textile work into the netting, of which the people made great use, not only for fishing, but for carrying *umeke* or bowls, and as a foundation for the feather work already described.<sup>1</sup> All this is essentially the work of a primitive people. Hand-made mats, baskets, nets are found everywhere among savage races in one form or another, and however perfect the handicraft, however beautiful the form or decoration, we recognize the process as of a lower order of civilization. And yet there is a flavor of humanity in this simple work of untutored man that the mere mechanical products of the loom or knitting machine can never show. In the whirl and rush of the twentieth century there is little time for the natural work of human hands fashioning a basket, plaiting a mat or knotting a net; the people who can only make these things as their ancestors did long generations ago are passing off the stage, and the inanimate machine, the modern slave of civilized man, is doing this work,—but in how different a way!

Will the baskets of the Amerind, which now sometimes bear a valuation of several hundred dollars, be fairly replaced by any machine-made product? Will any loom put out such fabrics as the old Niihau mats, each one the work of years? It is the same with other hand-made fabrics. The Kashmir valley, where the songs of the weavers on the banks of the Jhelum are translated into harmonious design, may still smile at the fabrics of the steam-driven and ingenious looms of Jacquard in sunny France. The individuality is lost in the multitude. Can the most perfect productions of chromatic printing show to the critic the touch of the master whose work has been copied by many and intricate processes? When mats are produced by the yard, baskets by the thousands, and nets by the mile, artistic interest departs from them and we look only to their utility. Does not the father look with truer pleasure upon the first ungrammatical, misspelled composition of his child than upon the correct and finished writing of his maturer years?

Human nature also delights in rarities, and aboriginal mats and baskets are fast becoming few in number as their makers are “civilized” from off the earth. We

<sup>1</sup> Memoirs B. P. Bishop Museum, Vol. I, No. 1.  
MEMOIRS B. P. B. MUSEUM. VOL. II, No. 1.—1.

have fragments of baskets and mats from the Egyptian tombs of early dynasties, and wonderfully woven cloths from the *huaca* of ancient Peru; but where, outside of a few museums, are the mats and baskets of a majority of the tribes of Amerinds? I do not know of a single specimen of old Hawaiian basket in any of the principal museums of the world,—the only complete specimen that survives is in the Bishop Museum.<sup>2</sup> The art is wholly lost to the Hawaiians and their choicest mats are now very rare. Basket making of the choice kind ceased on these islands many years ago, and another generation will have forgotten how to make *makaloa* mats. The subject then of aboriginal basket and mat making is growing in interest and importance, and even the islands of the great ocean can contribute to its history.

In Polynesia there was no loom, for the pegs and bars used by the Maori of New Zealand to assist in weaving his mat of "flax" (*Phormium tenax*) do not deserve the name. Cloth was generally replaced by paper, commonly called tapa or bark cloth, from Rapanui to Kauai and across the ocean westward. All along the northern and western boundaries of Polynesia the islanders had looms, and, as we shall see later, those of the Caroline and Santa Cruz groups were sufficiently developed to turn out admirable products. If the proto-Polynesians came from Asia they saw a fence of looms across every possible path from thence to the Pacific. On all the islands where they settled there are and have been cultivated the paper mulberry (*Broussonetia papyrifera*), hibiscus, banana and other fibre-plants used more or less in the textile processes. The material was at hand, but with the exception of the Maori, whose climate forbade, Polynesians preferred to felt their fibres rather than weave them, although they all understood the process of extracting these fibres as in the hibiscus mats of the Samoans, the oloná cord of the Hawaiians, and the sennit of coconut husk fibre of Polynesians generally. That they made fairly good use of their knowledge, apart from the loom, I shall endeavor to show by the work of the Hawaiians and, so far as material is at my disposal, of other Polynesians and their neighbors with whom they had in ancient times more or less communication.

All through Polynesia the immigrants found vegetable products very fit for basket or mat making. Whether on some of the groups certain plants were brought with the immigrants or preceded them in colonization need not be discussed here. Everywhere they had, even during the period of their legendary history, the hala (*Pandanus odoratissimus, et al. sp.*) of which the leaves were used for both mats and baskets, and the fibres of the aerial roots for sandals and baskets; coconut (*Cocos nucifera*) whose fibres they twisted or braided, whose leaves they made into baskets, mats and fans, and whose rootlets they used to plait into fish baskets and traps; waoke

<sup>2</sup>Several of these baskets have long been in use in Honolulu families, but almost invariably without the cover that properly belongs to them, as we shall see below. One, added to the Museum collection since the above was written, was in use for fifty-five years by the giver.

(*Broussonetia papyrifera*) whose fibres were beaten into kapa or twisted into strong cord; hau, fau, hibiscus (*Paritium tiliaceum*), whose bast yields a strong fibre used for mats and cords; and banana (*Musa var. sp.*), of which the fibres are of many grades, used chiefly for fine mats and belts.

The Hawaiians had in addition ukiuki, a thick-bladed grass whose leaves were braided into sennit to tie together the beams and rafters of the native house, *hale pili*:

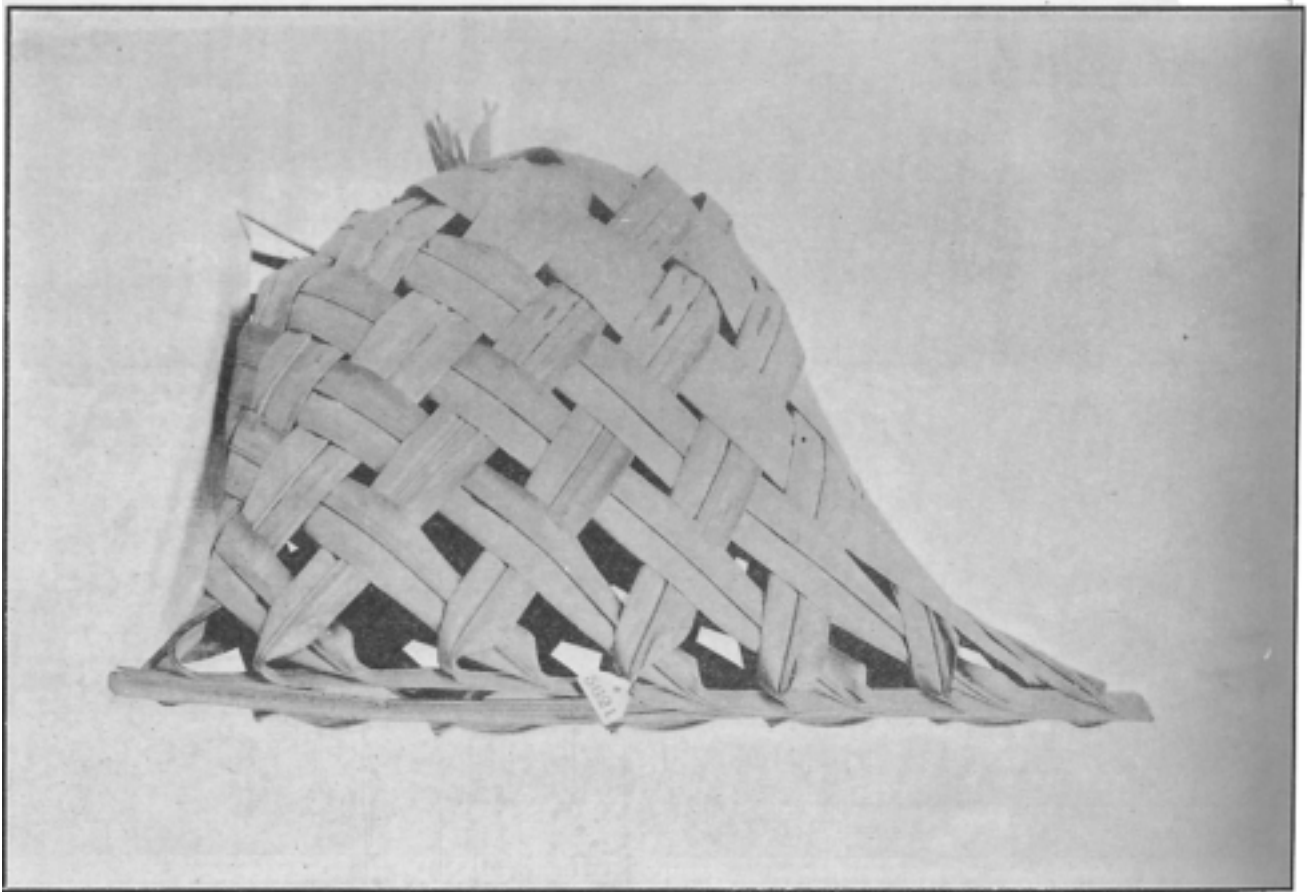


FIG. 1. COCONUT LEAF BASKET.

makaloa (*Cyperus laevigatus*), a sedge from whose tender stems the fine Niihau mats were woven; ononá (*Touchardia latifolia*), invaluable for its tough and durable fibre, from which were twisted cords for fish lines, nets, etc.; mamaki (*Pipturus albidus*), used mostly for felting into coarse, tough kapa, but also for cords and ropes; ieie (*Freyinetia arnotti*, and in Tahiti *F. demissa*), from whose aerial rootlets the choicest and most durable of the Hawaiian baskets were made; iwaiwa, several ferns from whose stems were plaited fish traps and baskets. Other fibrous plants of less extensive use will be noticed as they occur.

With this wealth of material, mostly growing wild, but in some cases, as waoke and oloná, cultivated for convenience or to improve the quality, it is not strange that the islanders made their clothes (scanty indeed, but sufficient), their beds and pillows, carpets and house linings, baskets, shoes and hats, fish lines and nets, sennit, cords and ropes of the varied form and quality we are to consider in this chapter. While the use of some of these fibres for felting in the interesting manufacture of paper (kapa), for which Polynesians are celebrated, must, from its importance, be treated in a separate chapter, the other uses of a textile nature will be treated here, arranged for convenience under the following heads:—

PALM LEAVES AND FIBRES.—Baskets, Fans, Sennit, Hats.

PALM STEMS.—Shields.

PANDANUS.—Hats, Mats, Pillows, Baskets, Sails, Mat Garments, Cord (covered), Fijian Basket.

FREYCINETIA ROOTS.—Baskets.

FERN STEMS.—Baskets, Fish Traps.

GRASS.—Makaloa Mats, Rush Mats, Cord, Bambu Fans, Combs, Spears and Clubs.

SANDALS.

AUSTRALIAN BASKETS.

HIBISCUS FIBRE.—Mats of the Samoans.

BASKETS OF MAORI.

BANANA FIBRE.—Looms of the Caroline Islands, Caroline Dress Mats.

OLONA FIBRE.—Nets, Koko puu-puu.

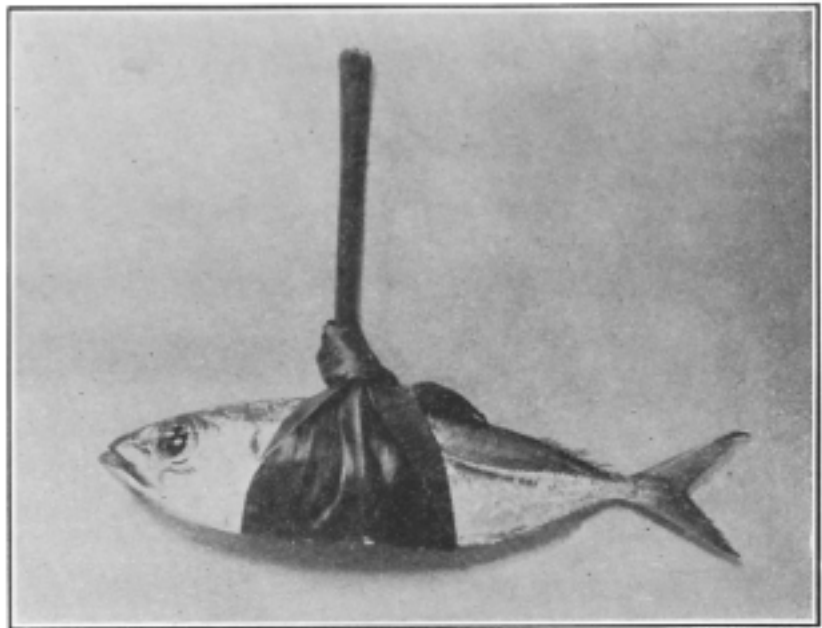


FIG. 2. HAWAIIAN KI LEAF BASKET.

While the order here indicated may in cases be departed from, the subjects will all receive attention and the general order will be preserved. It is an arrangement by material rather than by product.

Whether mats or baskets were first invented may not be definitely settled; nor is it of importance here where we are not treating of general manufactures, but only of special products in a region where man did not begin at the bottom, but came into the land armed with certain implements and a partial civilization. If it be necessary to explain why I begin with the latter, rather than the simpler mat, I would ask my reader to try to divest himself of all misleading facts of civilization as we know it, much as one does partially when camping in wild countries, or in living in this very Pacific region. He makes a hut of branches, he spreads a bed of leaves, but to gather the leaves as the birds do would be tedious and the night far gone before the couch would be comfortable; and he needs something which would answer to a basket

although he can do without a mat. We are supposing him without clothing (in the fashion of the region), so he can neither use his hat nor his handkerchief. He might have been wrecked on a desert island without the very convenient concomitants of the Swiss Family Robinson, and to gather his simple food, whether roots from the ground, nuts from the trees, or fish from the sea, would a mat or a basket come best to hand? To preserve his little hoard would he prefer a basket or a mat? But a basket is a more complicated bit of work than a mere flat mat. Perhaps some baskets are truly more difficult to make than are some mats; but here is one (Fig. 1), common enough through-

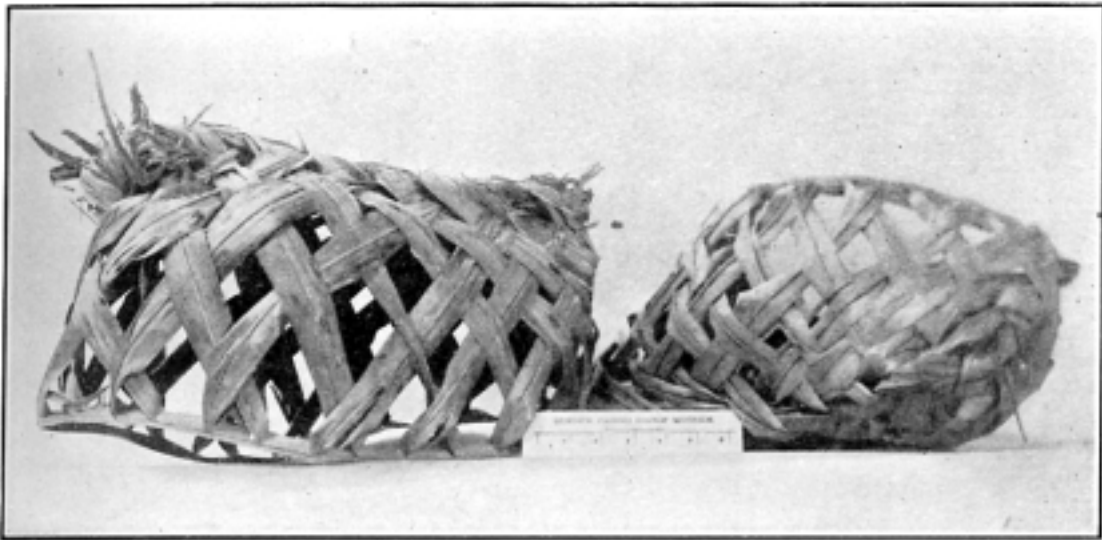


FIG. 3. COCONUT LEAF BASKETS FROM TUTUILA.

out the tropical world, which is as simple as can well be imagined, and, while an efficient basket, also suggests how to make a mat. The fresh leaf of the coco palm is always at hand and the suitable section of midrib is cut off from the long (10-12 feet) leaf and the leaflets braided together around whatever the basket is to hold. The strong midrib is the handle, and to open the basket it is only necessary to split this, an easy operation. The particular basket here figured came to me from Manila filled with delicious Manila mangoes—thanks to Lieutenant-Commander George M. Stoney of the U. S. Transport Solace—but similar rude baskets are made everywhere, and the traveler buys them at Suva or Apia filled with coral, and in some islands the carpenter or mason brings his few tools in a similar kit. Another that came to this Museum filled with madrepores is shown in Plate IV, the upper left-hand figure. The only simpler carrying machine of the nature of a basket known to me is the Hawaiian ki leaf (*Cordyline terminalis*), which is simply wrapped around a single fish (Fig. 2); or, if a number of articles are to be carried, as oranges or limes, a stem of leaves, each leaf



enwrapping a single fruit, makes a substitute for basket.<sup>3</sup> There are some satchel-like baskets (see Pl. II, Gilbert Island Basketry) that seem to be a folded mat, but on the other hand the basket may suggest a mat when it becomes ragged and broken open.

To study the evolution of a coco palm leaf basket we draw the material naturally from the central Pacific where the *Cocos nucifera* flourishes, and is indeed the principal tree of the low coral isl-

ands. Figure 1 shows a neat primitive form, but the more common of these simple baskets is much ruder and is used universally in bringing *copra* (the extracted meat of the ripe coconut) to the storehouses, for collecting fish and coral, and for many other purposes. In this Museum are Nos. 6592-93, which were brought full of coral from Pagopago, Tutuila, of the Samoan group (Fig. 3); and No. 5631, from Ponape of the Caroline Ids. (Plate I, left-hand upper.) Photographs in the Museum show precisely similar forms from Tonga and elsewhere in the coconut

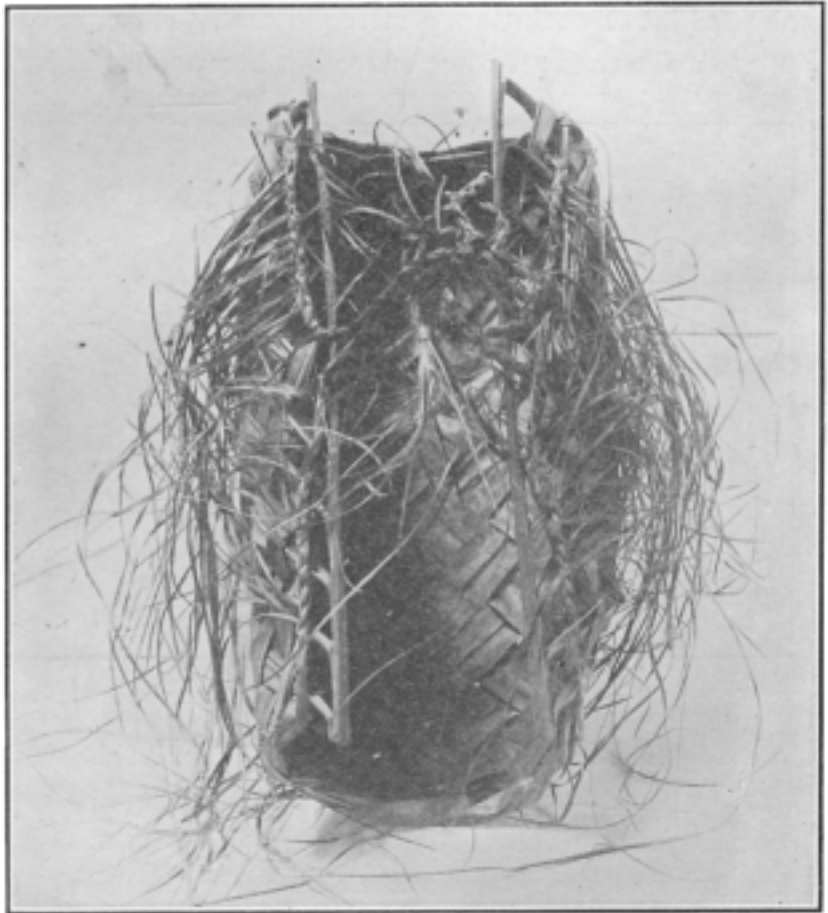


FIG. 4. COCONUT BASKET FROM SHORTLAND ISLAND.

region. Baskets of this class are limited in size by the leaf of which they are made. In Fig. 1, No. 5621, the length of the top strip is 17 in., and from this the depth of the basket is 11 in. No. 6592 is formed of a split strip 35 in. long, bent end to end; No. 6593 has a similar strip 47 in. long: while No. 5631 is composed of four split strips, each about 10 in. long and with six leaflets, woven simply together, the ends of the leaflets being brought up the sides and tied together to form a handle (not shown in the figure). The last basket measures 16×13 in., with a depth of about 8 in.

<sup>3</sup>Hon. S. B. Dole, in reading proof, reminds me that Hawaiians also tied the ends of the leaves together to make a sack for carrying ohia ai (*Eugenia malaccensis*).

It seems perfectly just to point to this type as the earliest form of basket, although made at the present day, no ancient specimen existing, at least from the region we are

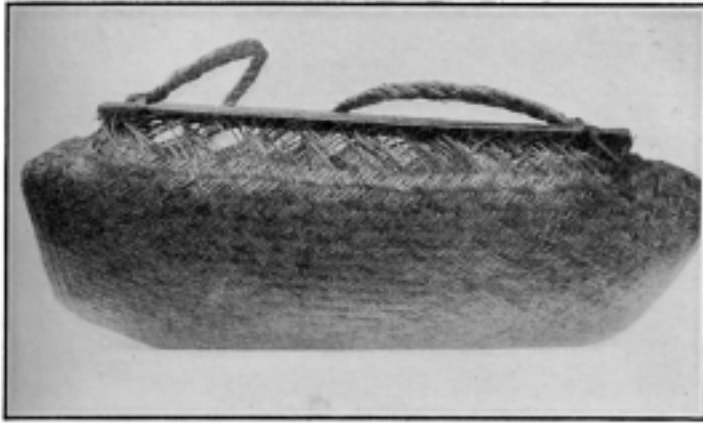


FIG. 5. PALM BASKET FROM PONAPE.

considering. The perishable nature of the material; the roughness of the workmanship; nay, the very abundance of specimens would account for their rarity or absence from early collections, for these were mostly made not for scientific purposes, nor to illustrate the life history of the natives, but simply as "curios", matters of oddity or rare workmanship. The series cannot be worked out from exclusively Hawaiian material because the coco palm, here near its tropical limit, does not grow freely nor develop luxuriant leaves: the pandanus was here the more important tree for the purposes of basketry as well as for mats, and the fashion of the basket and mat both partook of the peculiarities of material. We must turn then to the central Pacific for our illustrations.

Looking again at Plate I, next to the rude coconut frail, No. 5631, is a far finer basket, which at first glance seems to have little connection



FIG. 6. COCO LEAF BASKET FROM THE CAROLINES.

with its humble neighbor, but the curious form No. 8302, from Shortland Id., of the

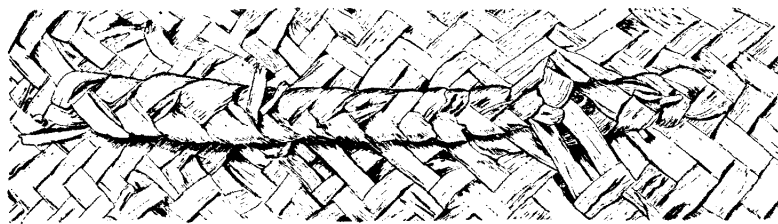


FIG. 7. CLOSURE OF BASKET BOTTOM.

Solomon group, may prove a connecting link. Here we have the split midrib 15 in. long, with eleven leaflets on each half, and these are neatly and closely plaited, the leaves overrunning at the edges and brought back to the midribs where they are split and a portion braided into short loops for handles, the rest finely shredded for an ornamental fringe. Does

of the Solomon group, may prove a connecting link. Here we have the split midrib 15 in. long, with eleven leaflets on each half, and these are neatly and closely plaited, the leaves overrunning at the edges and brought back to the midribs where they are split and a portion braided into short loops for handles, the rest finely shredded for an ornamental fringe. Does

not this chalk out in rough outline the far better finished basket of Ponape? (Fig. 5.) Here are the midribs 12.5 in. long, but instead of one there are eight on each side; that is, one is split into eight distinct pieces, and the portion of leaflet adhering to each is halved, each half passing in opposite direction in the weave, which is finer and twilled (three-leaf twill). The palm seems also to be of finer texture than the cocos, but is probably a young leaf. The edges or ends are continued in the weave so that they form a continuous side, meeting at the level of the midribs, as shown in the plate.

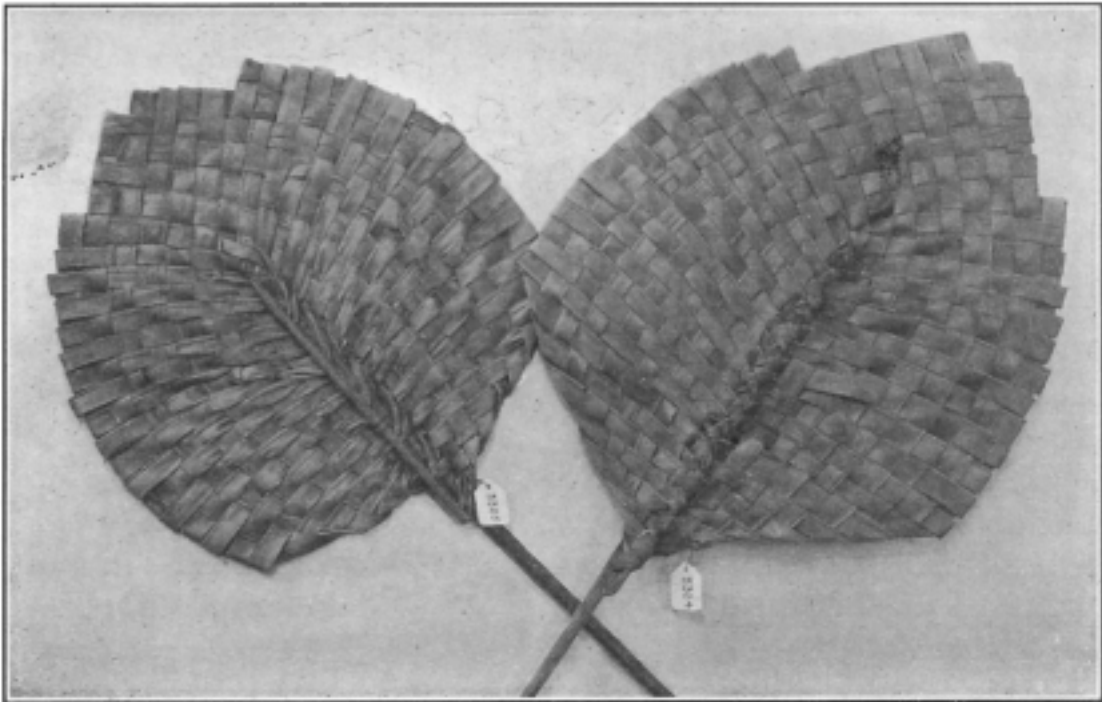


FIG. 8. FANS FROM THE SOLOMON ISLANDS.

The small rectangular basket, No. 7800, also from Ponape, shown in the corner of the same plate (II), measures only  $5 \times 3.7$  in. at the mouth and is about 2.2 in. deep. While the material, coco leaf, is the same as used in the last example the structure is different. The twill is three-leaf and arranged so that a triple band passes like a keel through the length of the basket; similar bands pass from each corner of the rim and turn horizontally at the bottom, while the rest of the weave is at right angles to these bands. At the top the ends of the strips are turned alternately in and out over a rim of sticks which is beautifully and with great regularity sewn over and over with a two-ply thread apparently of some fine grass. Handles of similar cord but three-ply are attached to the corners.

We may return to the coco leaf midribs to see how they are used in fashioning a complete basket, not only in the Carolines, but in very closely allied form as far east

as the Gilbert group (No. 7518, not figured). In the Caroline basket, shown in Pl. II, and also more distinctly in Fig. 6, the same bits of midrib that we have seen in the simplest form of basket appear here again, in a somewhat degraded form it is true, but when the covered rim is stripped of its covering of leaf sewed over with coco cord there are the sections of midrib, four in number, as the woody tissue does not stand a

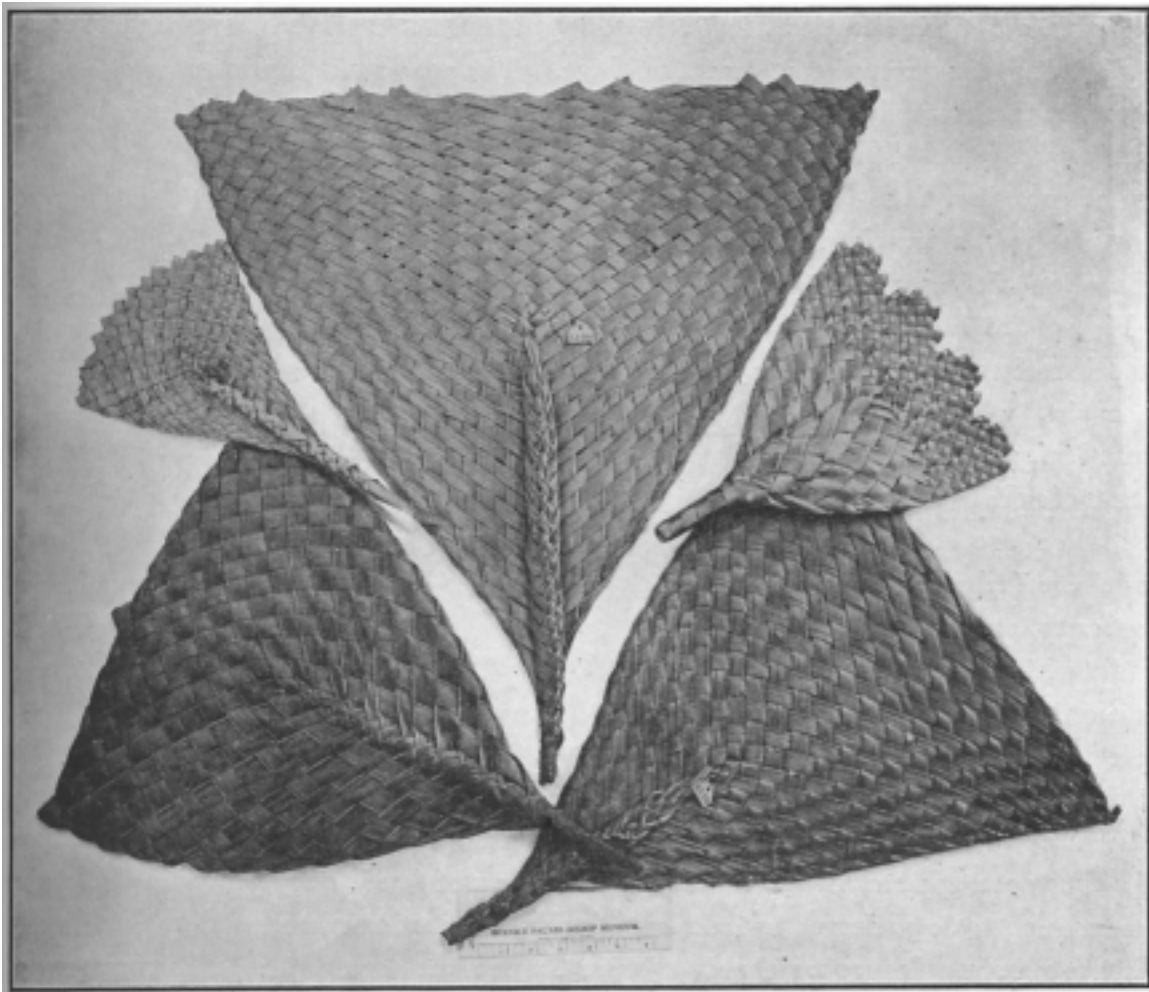


FIG. 9. HAWAIIAN COCO LEAF FANS.

sharp bend without breaking, and only enough wood has been left to hold the attached leaflets together and at the same time take the place of the sticks often used in such a place. The leaf strips are twilled into each other (two-leaf twill), forming a continuous surface not absolutely symmetrical, and the ends are braided into a ridge extending over more than half the length of the bottom, as shown in Fig. 7. This ridge serves to strengthen the basket and protect the bottom from undue wear. The cover is formed in similar way but with only one strip of midrib, and is attached to the basket

not only on one of the long sides but for a short distance on both ends, apparently to keep the cover closed when not forcibly held open. The handles are of stout coco cord. In the Gilbert Ids. specimen, No. 7518, the form is more symmetrical, and the leaf used is lighter in color; otherwise the construction is identical.

The midrib structure appears again in the fans from Shortland Id., shown in Fig. 8. Two strips of a split midrib, each with six leaflets attached, are used in the weave; an additional portion of midrib stripped of leaflets serves as handle, the other midrib being cut off at the base of the blade. The workmanship is rude, by no means so neat as the Hawaiian leaf fans, but is effective. The blades are about 12 in. wide.

Turning to the Hawaiian form of coco leaf fans (*Peahi niu*) we find a much finer elaboration of the same device.

In Fig. 9 the fans, with the exception of the small one on the right, which is of pandanus leaf, are formed from a section of midrib not split, and the leaflets are deftly twisted over the midrib in a firm braid, the lower ones forming the handle without additional preparation, and the others with these gradually opening in

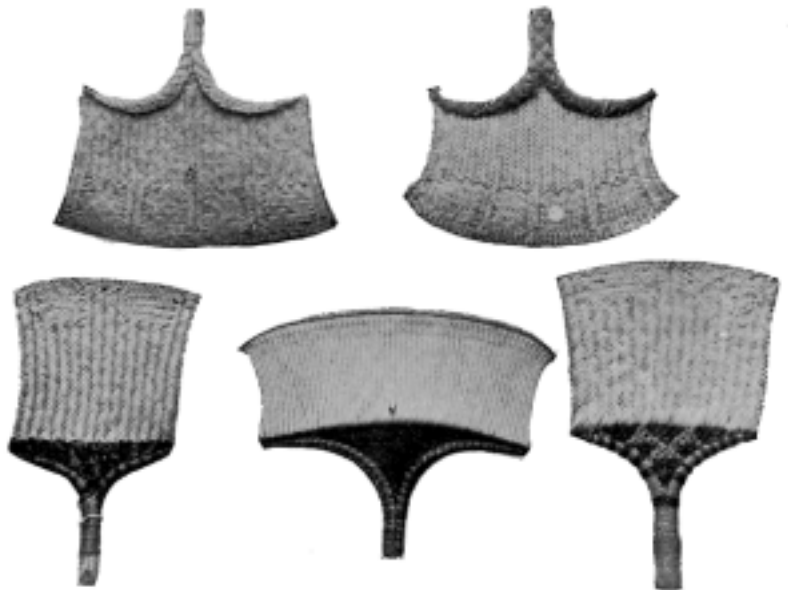


FIG. 10. HAWAIIAN FANS IN THE BRITISH MUSEUM.

the weave until the extent of the leaflets is nearly reached, when the ends are turned in, forming either a straight edge, or curved, smooth, or with serrations. Sometimes only one tooth appears in the middle. This form of fan is very practical and durable, and is much to be preferred to the more fanciful but modern designs shown in Plate XV. With the young leaves of the date palm the leaflets are often reflexed on one side instead of crossed (No. 5117). In modern times the leaves of some of the many introduced palms are used by the Hawaiians in the same way.

That fans were used by the old Hawaiians we learn from ancient *mele* or songs, and in the Song of Kawelo<sup>4</sup> occurs the following fragment:—

Papa o hee ia nei lae.  
E u'alo, e ualo  
Ua alo mai nei ia'u  
Ka launiu e o peahi e;  
E hoi au e, e hoi aku.

Go, daughter of Papa, away from  
this headland;  
Cease thy lamentations;  
Cease to beckon to me with thy  
fan of coconut leaves;  
I will come again. Depart thou!

<sup>4</sup>Contributions of a Venerable Savage to the Ancient History of the Hawaiian Islands. Translated from the French of Jules Remy by William T. Brigham. Boston, 1868. (p. 41.) Also reprinted by Nordhoff in his California, etc.



A form of fan used by the chiefs before the advent of foreigners is shown in Fig. 10, representing a collection of Hawaiian fans in the British Museum. None of these are so useful as those shown in the preceding figure. I have not examined carefully these fans, which have, I understand, been in the British Museum for many years; but, from the specimen in the Bishop Museum, shown in Fig. 11, it is probable that some of them are of pandanus. In this last fan, which is very old and brittle, the form is not so useful as ornamental; the blade is closely and neatly woven; the spreading handle, which is the remarkable part of the fan, is carefully embroidered with

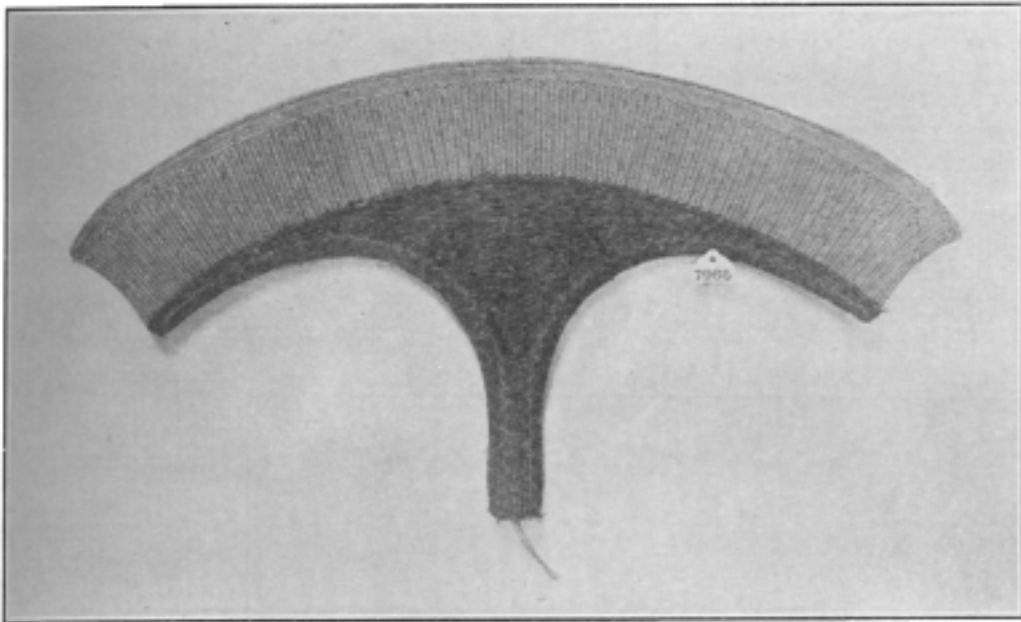


FIG. 11. ANCIENT HAWAIIAN FAN. BISHOP MUSEUM.

human hair and some brown fibre. In many respects this work surpasses in design anything Hawaiian in the department of basketry. Only the Solomon Islanders, as we shall see later on, have done finer work of the kind in their grass embroidery. The use of human hair, whether of friend or enemy, was common in Samoa and Fiji as well as on Hawaii, but on the last group the hair was almost always that of some friend. Several of these fans are in the Museum of the Peabody Academy of Science at Salem, Mass., most of them of good form. These were in the old Marine Museum early in the last century. I have never seen any of these old time fans in private collections on these Islands.

In all countries where the coco palm abounds considerable use is made of the leaves for walls, fences, fish weirs, screens, etc. Two leaves, or more commonly the halves of a leaf, are placed with the split midrib outward and the leaflets rudely interwoven. The sides of tropical houses are often made of this rustic paneling, and on the Hawaiian Ids. it is a favorite construction for sides and roof of temporary verandahs or lanai.

Before leaving the coconut fans a point in their construction may be noted. While the method described where the fan grows from the midrib is the common one, and perhaps the most natural one, there are often loose leaves that may be used for the purpose, and then the fan is started at the outer rim as a mat would be, and constantly narrowing the weave the ends are at last braided together to stiffen the blade and gathered to form a handle. This structure is shown in Fig. 12, and may be termed the centripetal, while the former is the centrifugal system. In the illustration the first fan is Hawaiian and made of pandanus leaves; the second is also Hawaiian but made of palm; the third is from the

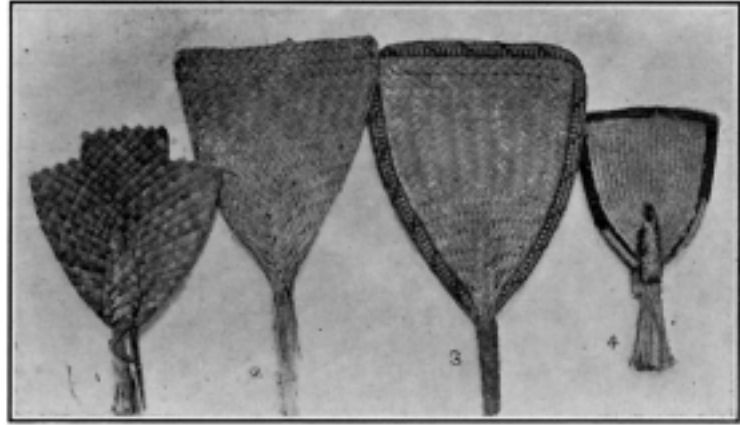


FIG. 12. VARIOUS FANS.

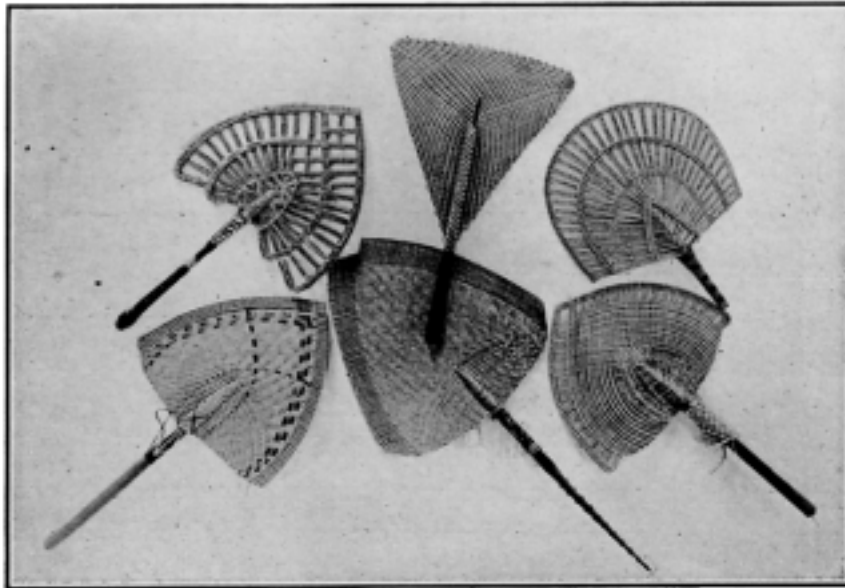


FIG. 13. SAMOAN FANS.

Marshall group and is of coconut leaf, the handle neatly plaited with coco cord and edged with pandanus and hibiscus; while the fourth is from the Carolines and well woven from palm, but was covered on the edge coarsely with foreign cloth.

#### **Samoa Fans.—**

To those who have only seen the skeleton form of fans usually purchased by travelers, or sold in the curiosity shops, the variety of form and construction of Samoan fans (*ili*) is surprising. Take, in the illustration (Fig. 13), the central triangular fan which recalls the common Hawaiian form, but is of entirely different construction. In the Hawaiian fan, it will be remembered, the weaving is uniform

and the leaves themselves serve for handle; in the Samoan the weave is on a trellis, as it were, and the strands are very narrow, the handle is of wood braided in afterwards; it is a good substantial form. The curious way in which the edge strands are bent to cover the ends of other strands is shown in Fig. 14. Directly under this fan in the previous figure is one of considerable surface ending in a square trellis border, also shown in the figure of enlargements on the left. The handle is carved, as was generally

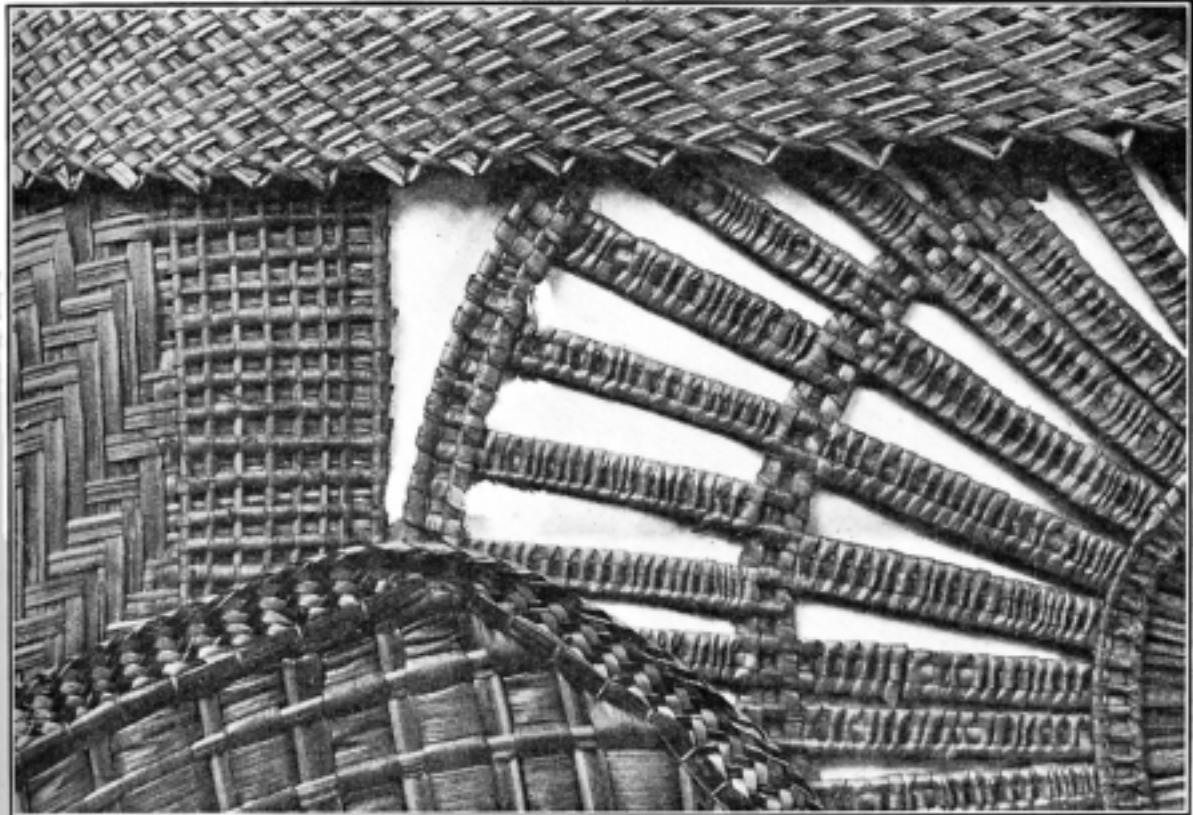


FIG. 14. ENLARGED FANS TO SHOW STRUCTURE.

the case in the better class of fans in the Society and Hervey Ids., and rather clumsily inserted, the ends of the central strands being bound to the shaft by a fine cord of human hair, that popular ornament in the Pacific.

In No. 2139, on the right of the triangular fan (Fig. 13), is a horseshoe-shaped skeleton fan which raises more wind than its open construction would promise. For handle the strands are bound together with sennit, and the general construction is shown on the right side of Fig. 14. On the other side of Fig. 13 is a pointed form, perhaps more common than the round. The other forms in the illustration need no especial description. As in almost all Pacific groups the modern manufacture shows a marked

deterioration from the ancient standard, and in Samoa the use of other material than palm leaves, and the employment of tawdry dyes together with much less care in weaving mark the modern product.

**Fijian Fans.**—Rather coarse, clumsy, but at the same time durable and effective are the fans shown in Fig. 15. I do not claim that this is the only form in use in the Vitian group, where the work in carving and sennit is particularly good, but it is the only form of

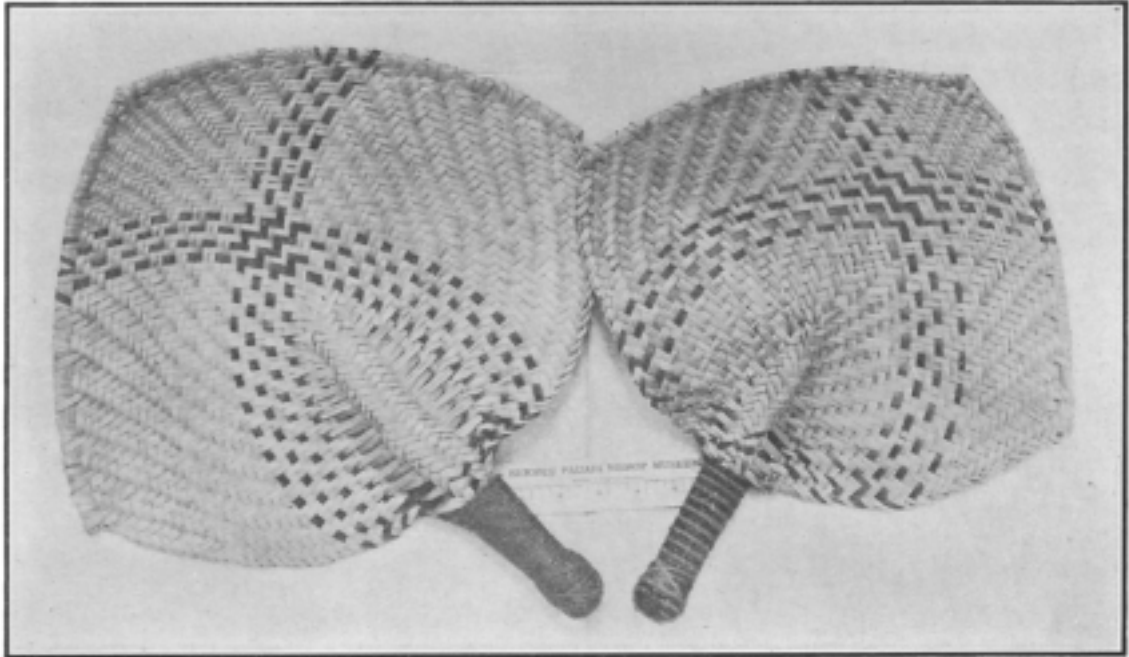


FIG. 15. FIJIAN PALM LEAF FANS.

basket work fan that happens to be in this Museum,<sup>5</sup> and it is noteworthy for a peculiarity of structure. Several strips of the coco leaf are laid together on the upper edges to form a rim, and from these the two-leaf twill weave passes to the base where the ends of the strands are collected for a handle which is braced by braids on both sides of the fan and is wound with sennit. In both fans four strands of dyed leaf are introduced for ornament.

**Marshall Islands Fans.**—In Fig. 16 are shown but three fans from a group where basketry flourishes and mats are made of remarkably good design and workmanship, as will be seen later on when fabrics of pandanus have their turn. To this later page must be referred the central specimen of the group which is of thin pandanus mat embroidered with red and black fibre. The mat is double and a stick is inserted for handle and covered with brown and black mat work of the same material as the body of the fan.

<sup>5</sup>There are kapa and tortoise shell fans in the Vitian collection.

While all the Marshall Islands fans do not have a border, this is certainly a very common appendage and is shown on all three fans in the illustration. The two specimens on the sides are woven in the trellis method as may be distinctly seen in the lower specimen of Fig. 14. The trellis is of the midrib of the coco palm leaf and leaf strips are woven into this framework, making a strong, stiff fan. The border is sewn on over a fibrous strip with fine coco cord, and the bundle of midribs, continuous with

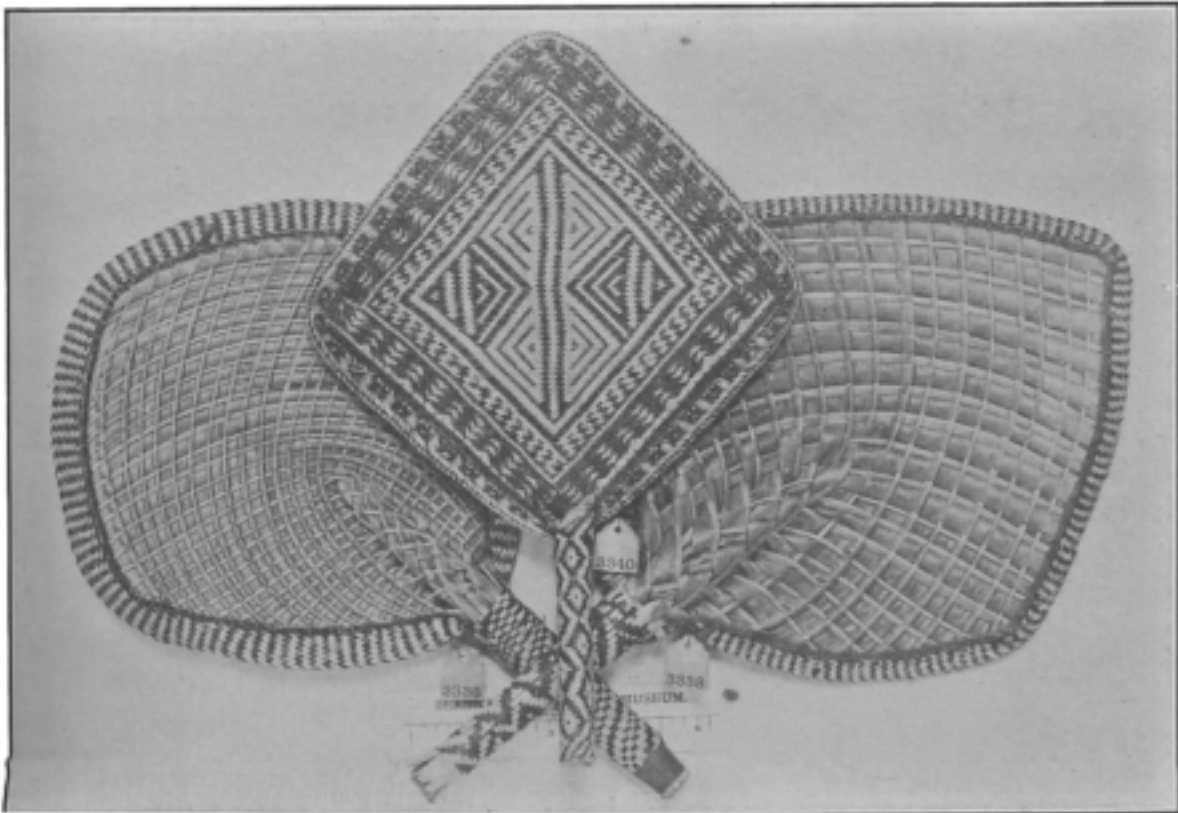


FIG. 16. MARSHALL ISLANDS FANS.

the blade of the fan, is covered with mat work as in the first specimen, the black here being some kind of bast, probably hibiscus dyed black with mangrove fruit.

Not only the warm temperature but also the flies, which are a great pest on some islands of the Pacific, make fans a necessary implement for comfort, although the Samoans and other islanders used a fly-flap made of coco fibre mounted on a handle, and the Hawaiians used the feather kahili of small size for that purpose; and certainly the development of the fan industry merits a more generous treatment than can be given where only the basket work class can be used for comparison with similar work of the old Hawaiians, but a large collection of the fans of the Pacific has yet to be made, and even the old museums which have the most of the relics of old Polynesian handi-



craft have few fans. The use of fans as insignia of rank, so common in southeastern Asia, and seen also in the flabelli of papal display at Rome, does not seem to have had much vogue among the scattered islands of the great ocean.

The attraction of evolution has led us from baskets to fans, but we must now return to another form of basket made from palm leaf and wholly unconnected with the "midrib structure". No. 3346, in Plate I, is a coiled basket of palm from the

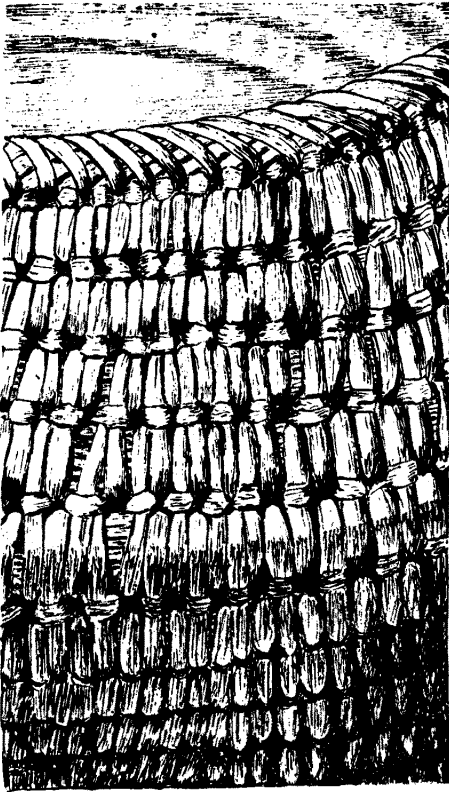


FIG. 19. CAROLINE IDS. BASKET.

Caroline Ids., looking at first glance like a rattan basket; but it is from the leaf and not the stem that it is constructed. To show the coils and the methods of binding these together Mr. L. G. Blackman has drawn for me two figures (19-20) and from these the entire structure of the basket may be seen;—the neatly sewed rim, the knots between each coil, the many sticks that compose this coil, and in the second diagram the curious displacement of what seem to be direct vertical lines of strip binding the coils. With these the curious reader can follow the construction, which certainly differs greatly from that of any basket belonging to the Hawaiian group, and it seems to show traces of a Malay origin, as do so many things and people of the Caroline archipelago.

**Solomon Islands Shields.**—There are several plaited shields in the Bishop Museum, but one, No. 1859 (Fig. 21) is of very remarkable construction. A framework, 33×10.5 in., of rattan, light colored and rather soft but heavy, pared down flat, is covered with a fine weaving of rattan strips, the edges being bound by a braid of the same. Around the curved portions, top and bottom, is a border of pandanus strips about 0.25 in. wide, dyed red, folded over on the inner edge of the front of the shield, and the corners of the fold trimmed off so as to leave enough of the leaf to hold the two parts of the strip together. As shown in the illustration (Fig. 21), there is a decorative figure woven in black strips of the same material at top and bottom of the shield. Both sides are woven alike, including the black

FIG. 20. COURSE OF STRIPS.

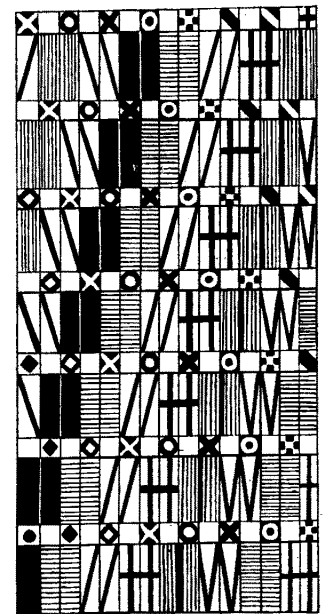


FIG. 20. COURSE OF STRIPS.

FIG. 21. SHIELD.

figures, but the inside has a covering of broad (5.5 in.) leaves of the pandanus. The decorations are very remarkable, consisting of twenty-three shell rings  $\frac{7}{8}$  in. in diameter in two transverse bands, and 3677 smaller shell rings or beads disposed in bands and pendants. The main bands are wholly of white shell, while the pendants are white, red (*Spondylus sp. ?*) and black, the latter of some vegetable matter at first thought to be coconut shell, but later, some marine growth. The bands are sewed with, and the tassels of the pendants strung on fine cord or coarse thread made of two-ply hibiscus fibre. The tassels of the pendants are tipped with perforated, elongated, pointed, black seeds with a hilum extending almost the entire length. Most conspicuous over all extends a cruciform figure composed of fifteen rosettes of red, black and yellow feathers. This cross seems purely geometrical and not an introduction of some missionary, for at the time this was obtained no missionary had landed on these shores since Mendaña raised the cross and took possession for Spain, and we read that the crosses he erected were at once destroyed by the natives.

When it is considered that the several thousand shell rings had to be bored with a rude pump drill, then strung in numbers on a tough midrib and rolled between stones until round, it will readily be admitted that the great value the islanders attach to such a shield is justified. Two other rattan

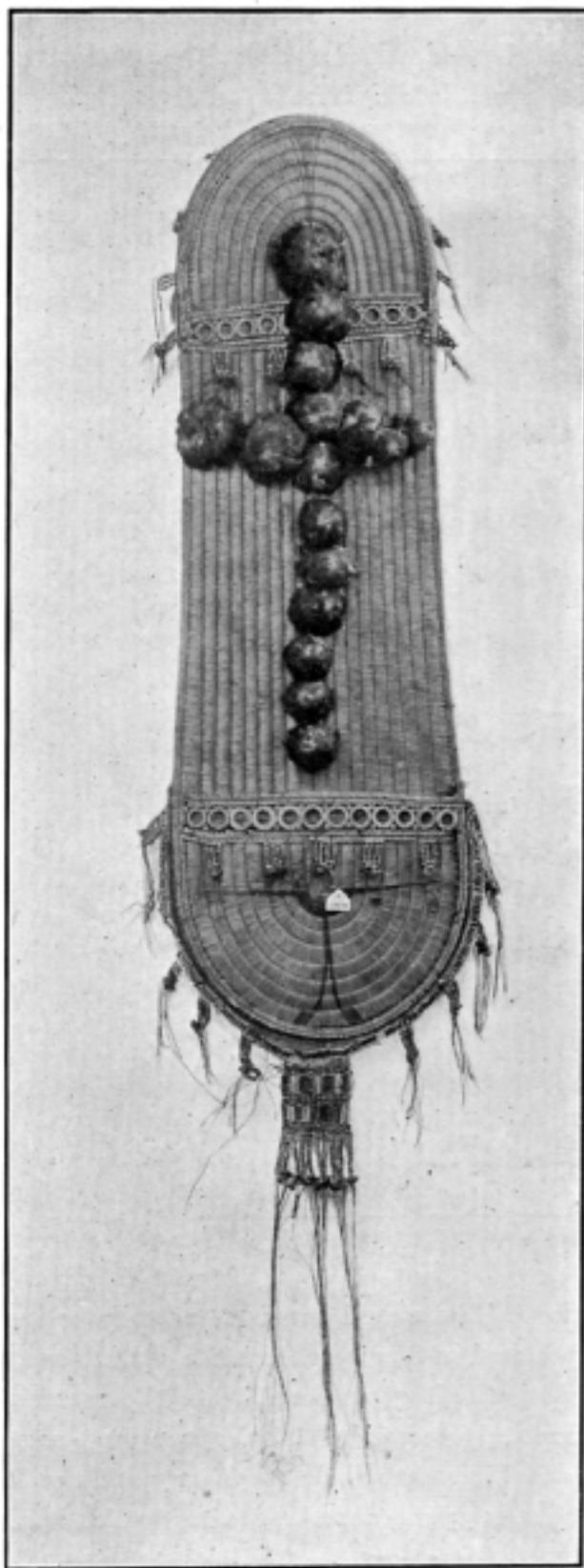


FIG. 21. SOLOMON ISLANDS SHIELD.

shields of a more common sort serve well to explain the material and structure of the shield just described. The shape of the shield No. 1860 differs considerably from that of the one first described, and the weaving becomes a very secondary part of its compo-

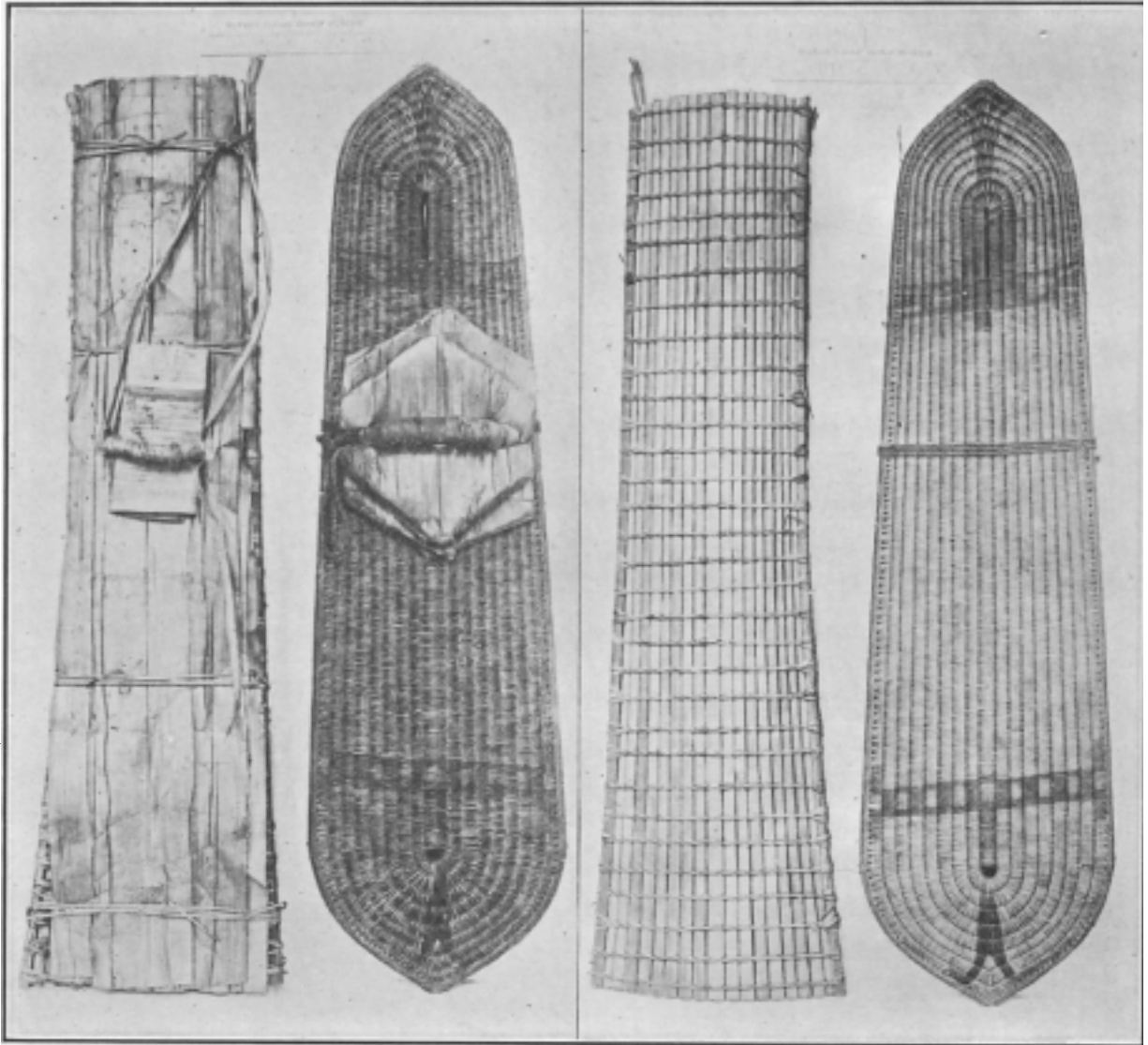


FIG. 22. RATTAN SHIELDS FROM THE SOLOMON ISLANDS.

sition. The shield consists, as may be seen in Fig. 22, of seventeen strips of rattan graduated in diameter from the central one, which is the largest. Besides these rattan strips, which gave the clue to the material of the first shield, where the skeleton is completely concealed by the weaving, are rounded strips of dark colored palm wood which bind the whole together with the help of thirty-two transverse braids. The length is 33 in., and the greatest width is 9.2 in. This specimen is from Ysabel.

No. 8315 has more the general shape of the first shield and is made in the same way, but the weave is single and not very close, so that the rattan strips which compose the substance of the fabric are easily seen between the strips of rattan skin. The course of the rattan (for so far as it appears it is a single strip) is spiral beginning at the centre of the lower and larger semicircle and ending on the right-hand outer edge of the smaller end. The designs are woven in with darker strips and are the same on both sides, but the dark and weather-stained surface of the shield renders these indistinct in the illustration. The inside is much less carefully woven, and the pandanus leaf lining is reduced to several hexagonal pads about the handle. This shield came from Rubiana, where its native name is *bako*, according to our collector. No. 1861 is a plain wooden shield of the same shape, and with similar designs in black but without weaving. It is lighter than the rattan shields. In some collections are wooden shields from this group decorated with inlaid pearl shell.

Besides the leaf the coir or fibre of the external coat of the coconut is much used in basketry. This coir is a well known article of commerce and is common in door mats and carpets, so that no especial description is needed here. In Polynesia its use for sennit is universal.

In the olden time the houses were tied together with it; outriggers made fast to the canoes; stone adzes bound to their handles; and in fact it was a most important factor in domestic economy and industrial art.

On the Gilbert Ids. the natives made a most elaborate and effective armor from this fibre that afforded protection from the weapons of shark teeth used in their warfare. Specimens of this armor are in most large ethnological museums, and Fig. 23 will show the common form. There is a jacket and trousers of netted fibre close and tough enough to generally withstand the shark teeth, but certainly so harsh in texture that the hair shirts the penitents of medieval Europe are said to have worn next the skin

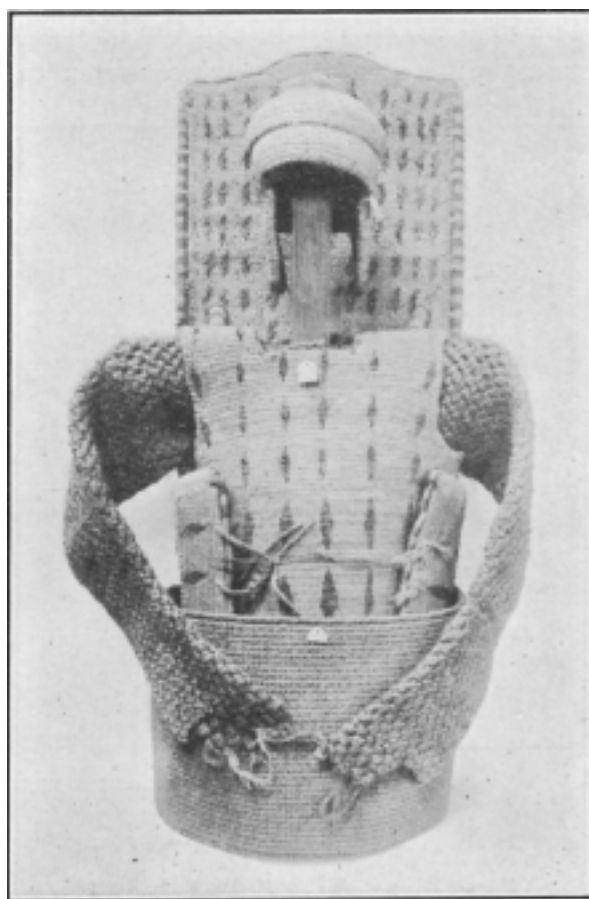


FIG. 23. COCO FIBRE ARMOR. GILBERT IDS.

would be a comfortable exchange. A white man's skin could hardly bear the rasp of the netted fibre. In many cases jacket and trousers are in one piece, like the combination suits of modern clothing, and over all this came the cuirass with its high back to protect the head. While there is no difficulty in tracing the weave, it is hard to see how the stiff and refractory cord was so closely bound together by fingers, however tough and strong. Over this cuirass was often worn a belt of even firmer texture, as shown in the illustration, and the helmet which capped the whole was ample protection from a shark tooth sword, or even from an ordinary club. None of this armor has been

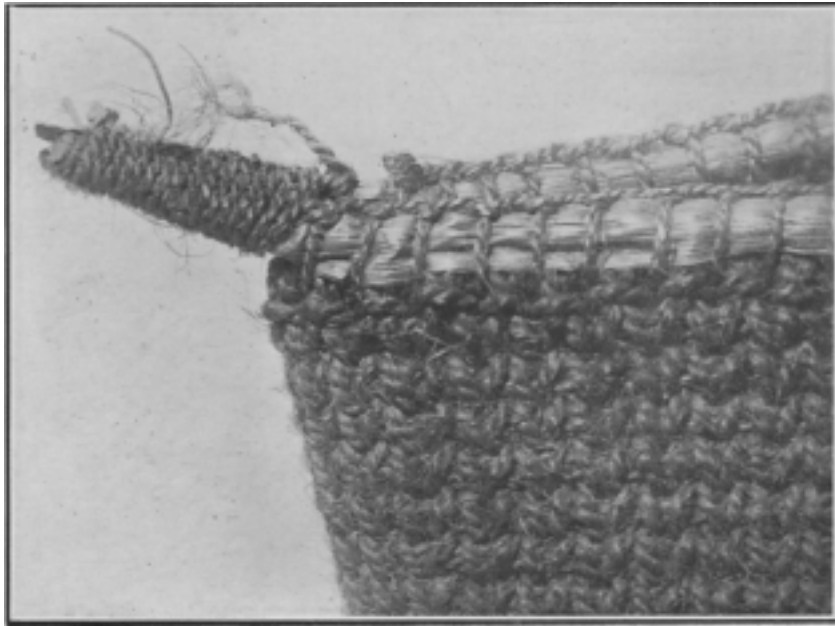


FIG. 24. END OF SENNIT BASKET FROM PONAPE.

made for two generations, and the people of today cannot tell how their grandfathers wove the curious basketry that now is found only in museums. By experiment it is found that a man encased in this armor is unable to get out of it without the help of his esquire, another parallel with the antipodal armor of medieval Europe.

Of the basketry proper a good example is shown in No. 7796 of Pl. II—a sennit basket from Ponape. The rectangular bottom is of cord twined over a foundation of sennit and is rather open; but the sides, as may be seen in the illustration (Fig. 24), are closely braided and the top is finished with pandanus leaf bound with sennit. The ends of this border are of split midrib and project 1.2 in., and those of both sides being bound firmly together serve as a spring to keep the mouth of the basket closed. The handles are small loops of sennit about large enough for a single finger. This is, or was, a common Ponapean form and seems very durable. Two specimens in the Bishop Museum are of the same size and pattern, 18 in. long at the top and 10 in. high.

Reference has been made in a previous publication (Director's Report, 1899, p. 25) to the curious way in which sennit is sometimes wound for use or preservation, and the illustration given there may be here repeated for the convenience of the reader (Fig. 25). This braided cord of various sizes was made generally by the old men, who



took their "braiding" to the public palavers, much as the old ladies of the higher races take their knitting to an afternoon gathering for gossip or sociability. Before the advent of nails to the Pacific sennit was in universal use, and its wide usefulness can hardly be appreciated by people who have a whole arsenal of nails, screws, bolts, clamps, etc. But our interest here is in the use made of this braid in basketry. Besides the example from the Carolines we have the curious cylindrical covered basket from Tonga, of which I have seen one in the Berne Museum and two in the British Museum (Fig. 26), but I believe them to be very scarce in the Tongan group at present. They are plaited in brown and black triangles, and decorated with white, seldom black, shell disks. Mariner gives in his account of the Tongan Islanders (1817) the following description of Tongan mats and baskets:

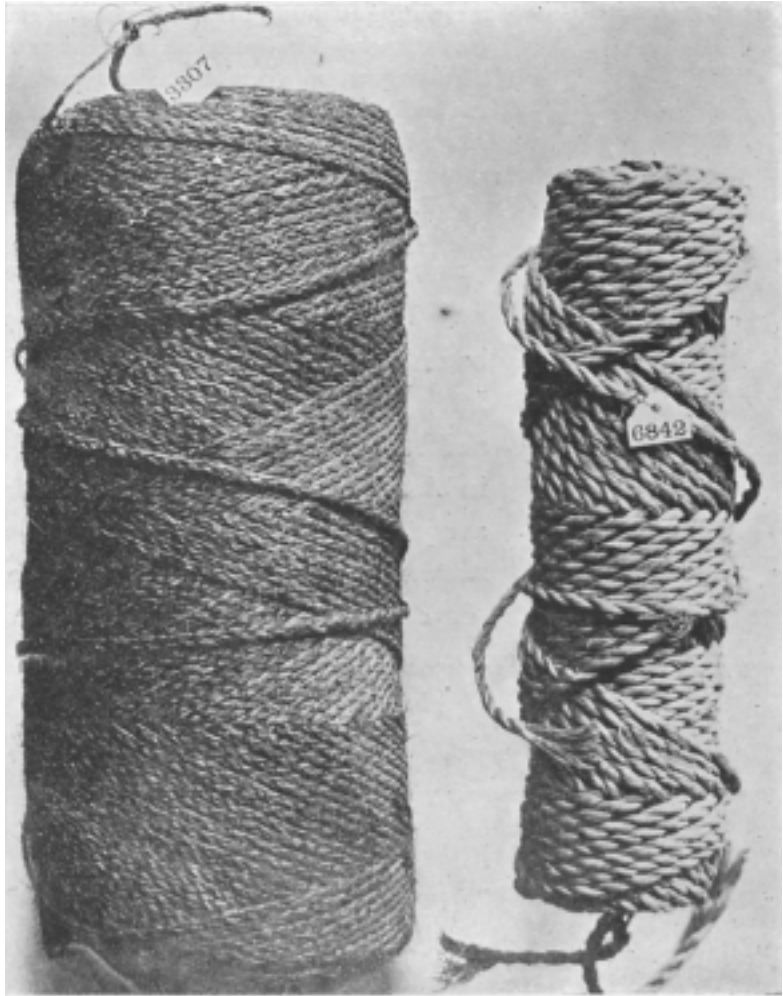


FIG. 25. ROLLS OF SENNIT.

In respect to mat and basket making, they have mats of various kinds, made of strips of leaves or bark selected, dried, and otherwise prepared; all of which, except one or two of a coarser kind, are fabricated by women. The following are the names and quality of them:

GNAFI GNAFI [GAFIGAFI].—Mats to wear, of a finer quality, made of the leaves of the *fa* or *paongo* [pandanus], that have been transplanted, in order to give them a finer and softer texture.

GIE.—Stronger mats made of the bark of the *fow* [fau=hibiscus], or *olonga* [olonà], worn chiefly by people in canoes to keep out the wet, as the water does not damage them: they appear as if they were made of horsehair. . . . .

FALLA.—Mats to sleep on, made of the leaves of the *paongo*. These are double, and are of various sizes, from six feet by three, to seventy or eighty feet by six; to lie along the whole length of the house.

LA.—Mats for sails, made of the leaves of the *fa* [pandanus]; they are very strong and light.

TACAPOW [TAKAPAU].—Mats for flooring houses, made of the young leaves of the cocoa-nut tree.

TATTOU [TATAU].—A sort of matting, plaited in a very ornamental way, made of young cocoanut leaves: they are used to screen the sides of the houses from the weather.

CATO [KATO].—Baskets: these are of various constructions; sometimes of a sort of matting made with the leaves of the fa, paongo, lo acow [akau=sugar cane], etc.; at other times of the fibrous root of the cocoanut tree interwoven with plait made of the husk of the nut, and have rather the appearance of wicker-work: the latter are sometimes variously stained and ornamented with beads or shells worked in. The larger and coarser baskets are generally made by men, to hold axes and other tools in; also the baskets to hold victuals, made of the leaves of the cocoanut tree are generally made by men.



FIG. 26. TONGAN BASKET IN BRITISH MUSEUM.

BAWIA.—Mats for thatching houses, are either made by men or women, but more frequently by the former.—Vol. II, p. 293.

The Tongans also covered wooden boxes with basket work, as we shall see later that the Hawaiians did with great skill. The Tongans had oblong baskets in black plaiting with brown decorations; a square basket of unusual weaving, as shown in the Museum at Berne, where

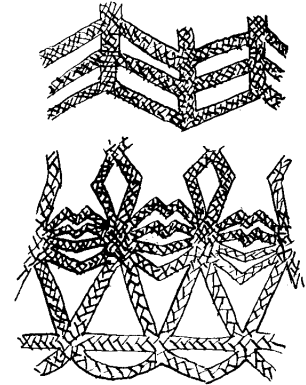


FIG. 27. OPEN WORK MATS FROM TONGA.

many of the specimens date from the time of Cook, whose artist, Wäber, was a native of that city and bequeathed all his collections to that municipality. With these were

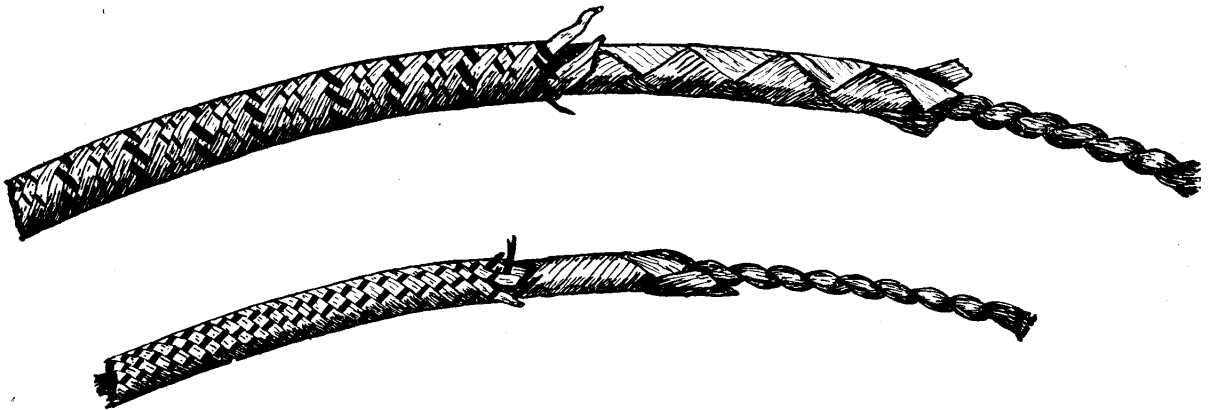


FIG. 28. COCO CORDS FROM MICRONESIA.

specimens of the curious open-work mats (of pandanus) shown in Fig. 27. In New Caledonia the gourd calabashes were artistically corded with sennit. The use of sennit on Fijian clubs, both for the grasp and for decoration, may also be noted. Even the Fijian spears were often ornamented with bands of fine black and white sennit. Not only the braided form was used, but also the plain twisted cord.

In the Carolines the braided slings of this fibre were sufficiently ornamental to serve as headbands when not in use for throwing stones. In the Marquesas a broad,

flat braid was used for holding taut the heads on the large wooden drums. On Hawaii a smaller braid was used for the same purpose; and also, as will be seen later on, for securing the covers to the fine baskets of *ieie*.

The Fijian temple house was sometimes entirely covered with sennit, and small models of these are in many museums, constructed of the same durable material. The attachment of the stone axe or adze to its handle was by coconut cord neatly interwound. By the same means the parts of a canoe were united, and the cable for the stone anchor was generally of the same material, as it did not rot when wet.

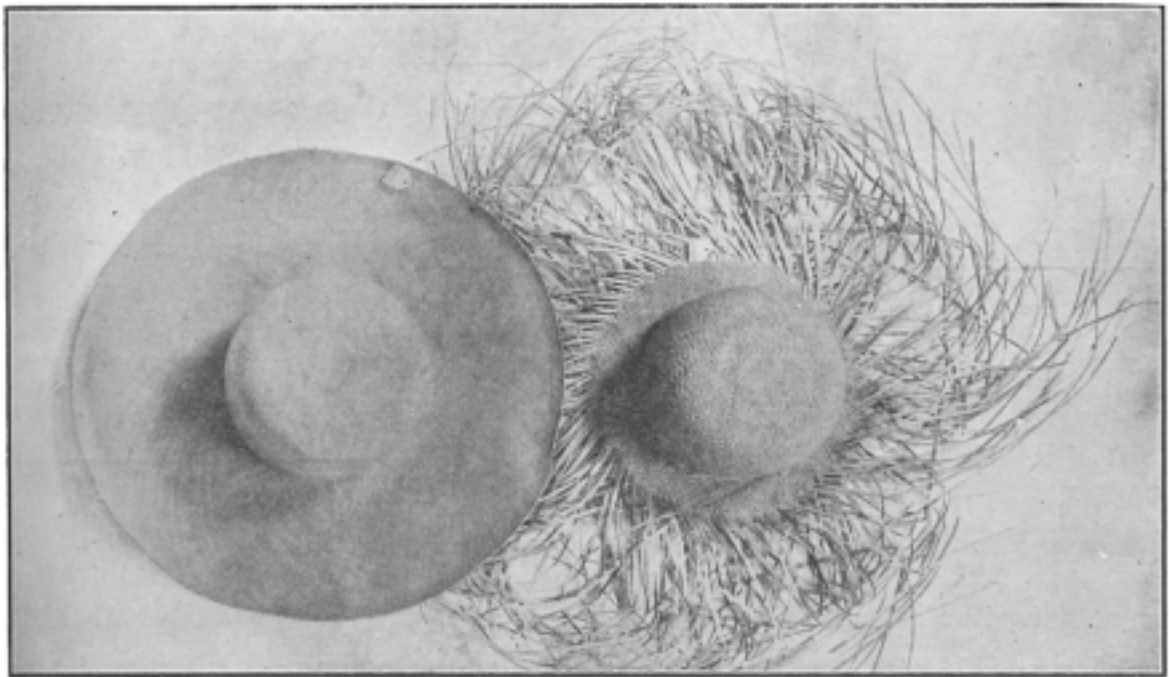


FIG. 29. PALM LEAF HATS FROM GUAM, MARIANAS.

**Decorated Cord.**—A coco fibre cord used in coils for belts, and for other purposes of ornamentation, is covered with a neat braid of pandanus leaf, and dyed hibiscus bast mingled in many tasty patterns. These cords were, in former years, brought to Honolulu from the Marshall and Gilbert Islands, and were much used for hanging pictures, as the strong fibre was not eaten by insects. This beautiful cord is formed in three concentric parts, as shown in Fig. 28. First a cord, usually of two-ply coco fibre; then comes a coat of plain pandanus; third, the woven coat of brown and black, which gives the cord its beauty and variety. The weavers must have very deft fingers, but I do not know whether the two pandanus coats are put on separately or simultaneously, that is, in close succession. There are many sizes and patterns of the cord in this Museum.

The rootlets of the coco palm are small and of nearly uniform size, well adapted for basket work. A fish trap that I once purchased at Pagopago was made of these white rootlets and measured 20 in. in diameter and 10 in. in depth. As I carried it



FIG. 30. BASKET OF PALM LEAF, SOLOMON IDS.

from the canoe up the accommodation ladder of the steamer, the Samoans, assembled in their canoes about the ship, set up a shout, imagining the foreigner was going a fishing.

The native palm, of which there are two species on the Hawaiian group—*Pritchardia gaudichaudi* and *P. martii*—is much used for hats, baskets, mats and fans. The leaf is palmate and sometimes 4 ft. in diameter; the young leaves are used before they have become green, and usually are split into strips not exceeding  $\frac{1}{8}$  in. in width, and for hats these are much narrower. Young leaves of the date palm are used in the same way, but they have less flexibility than the loulu or native palm, and so are not as well adapted for hats. As in ancient times the Hawaiians wore no hats, this industry is modern, and so far as hats are concerned it extends without much variation through Micronesia. Fig. 29 shows two hats of palm leaf, one of fine texture finished, the other coarser, partly braided. Natives of Hawaii making similar, though not so fine, hats of loulu palm are shown in the figure on the title page, a view taken in 1888 at Napoopoo, Hawaii, by Mr. Acland Wansey, formerly of the Museum staff.

For a very interesting basket of palm leaf we must turn to the western Pacific. On the Solomon Islands is made a basket of bowl shape, flexible, so that when empty it can be folded together like a good Panama hat. It is tastefully decorated with red and yellow strips, as can be seen in Fig. 30. The curious matter in its construction is that it has neither beginning nor end; it is a ring. Where



FIG. 31. BOTTOM OF NO. 8312.

the navel or point of beginning of an ordinary basket is found here is a hole 3.5 in. in diameter, the edge finished off as if the basket was complete at that place, as can be seen in Fig. 31, which represents the bottom of this basket, No. 8312. To complete the basket the maker sews in a square patch, which seems like putting a square peg in a round hole, but as the square patch is sufficiently large to cover the round hole the basket is complete. The patch is solidly interwoven, but as may be seen in Fig. 32, which presents the inside of the bottom, it is not a very trim contrivance. What the object of this feature is I do not know, but conjecture that the maker finds it more convenient to pass her hand through the hole while weaving. In two similar baskets in this Museum, although only half the size of the one illustrated, the bottom is pierced with a hole of the same size. The collector of these baskets did

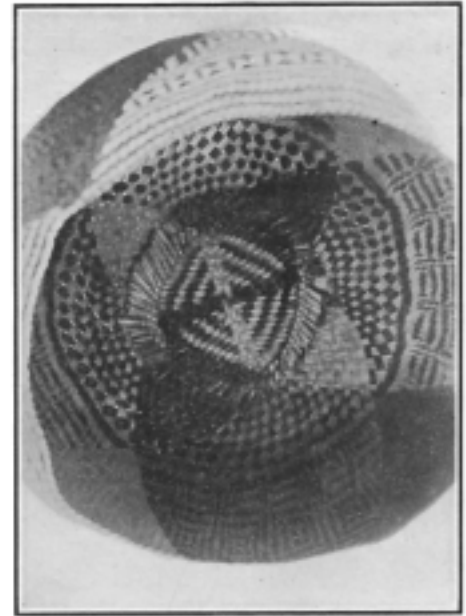


FIG. 32. INSIDE OF NO. 8312.

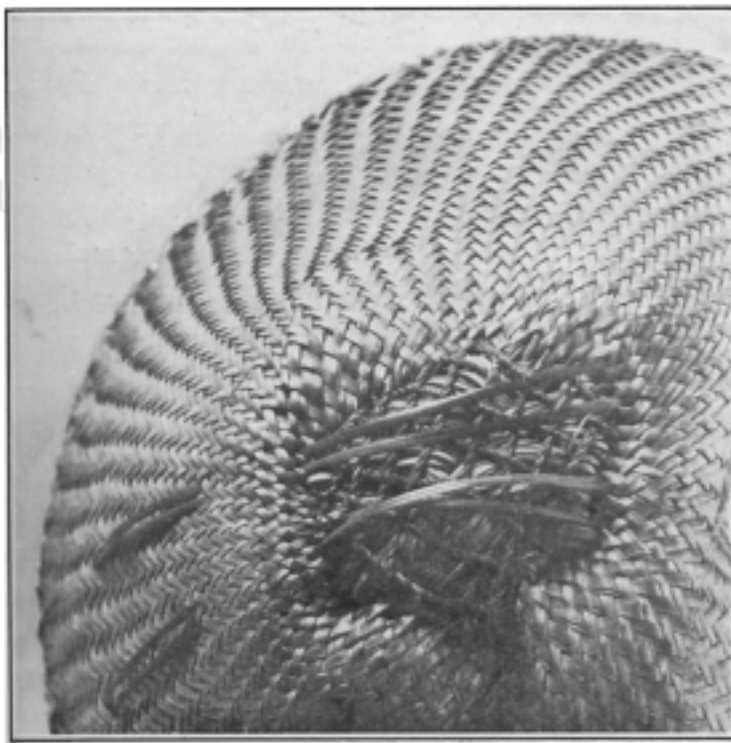


FIG. 33. BASKET FROM NEW HEBRIDES.

not notice the peculiarity, and so did not inquire the reason, and letters sent to the island Florida where they were made have not yet brought a reply. That the construction is not peculiar to this particular form of basket is seen in another made of coco leaves shown in Fig. 34. This bowl-like basket is 13 in. in diameter and 6 in. high. The mat plug is ornamentally woven to match with the basket, and the ends of the strips are knotted in the rim and left long, which would seem to be an objection to the pattern.

In the New Hebrides we find a similar structure, shown in Fig. 33, where the central portion of a coconut basket is filled with a rude "darn" of

coco cord. The long strips crossing the bottom appear again on the sides and serve for handles to this very flexible basket. Returning to basket No. 1888 (see Fig. 34) we also come back to our primitive coco leaf structure. The midrib is split and cut into short sections with the leaflets attached, and these sections break joints all round the inside of the rim, as shown in the figure, where one is supposed to be looking into

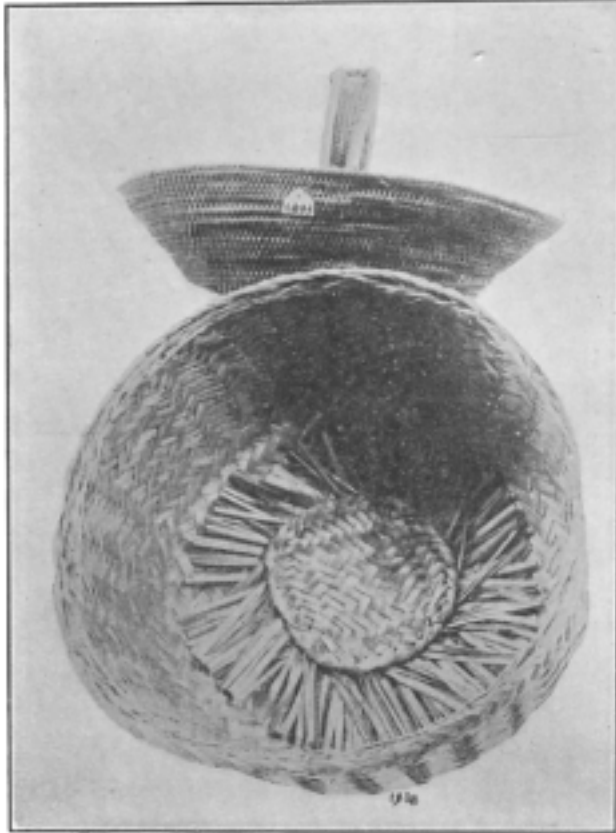


FIG. 34. BASKETS FROM FLORIDA, S. I.

the basket. The weave is usually a three-leaf twill changing four times in the circumference from the vertical to horizontal with five-leaf twill; the upper rim is braided. To make the basket of good substance the leaflets are double, the midrib in centre of fold, so that it shows on the external edge of the strip. The basket is 14 in. in diameter and 9 in. high, and the bottom hole is 4.5 in. in diameter, and the plug, as may be seen in the figure, is rudely rounded, the ends of the doubled leaves being left very long. There are no handles. The basket in the upper part of the illustration is also from the Solomon Ids., but of a very different model and material. It is certainly a common form of food basket, as the Museum possesses three examples, two of them quite large. In these the bottom is made in the usual way without

the mysterious hole. In our ignorance of the botany of the Solomons it is difficult to determine the material used, which much resembles rattan and was so labelled some years ago. If it be *calamus* it has been dyed a dark brown, almost black. Cane baskets of coiled work are common among the Australian natives; another in this collection is from Fiji; and still another from New Britain. A plain flat rattan basket from Santa Cruz is shown in Fig. 35. This is 20 in. in diameter, and the splints of rattan are taken in threes and simply interwoven; the ends are not turned but bound into a rim of sticks, an insecure method, as may be seen at the bottom of the figure. The absence of the genus *Calamus* in most of the Polynesian groups is sometimes made up by the use of bambu, but usually the flexibility of the former cannot be imitated by the stiffer grass. In the Pelew Ids., however, baskets of bambu have something of the

rattan physiognomy (Fig. 36). In the specimens figured, Nos. 8073-4, three stout strips serve for frame; over these the body is uniformly woven and the ends turned on sticks wound over and over by thin strips of bambu to form a rim. The bilge of the basket is protected and kept in shape by a twining of two bambu ribbons. These baskets are 8 in. in diameter and 3 in. deep. They approach the Chinese work closely.

Other satchel-shaped baskets of palm are in the Museum collections, but the localities are uncertain, and it seems better to pass them by, for the present at least. In the East Indies rattan is used to make excellent sleeping mats, and

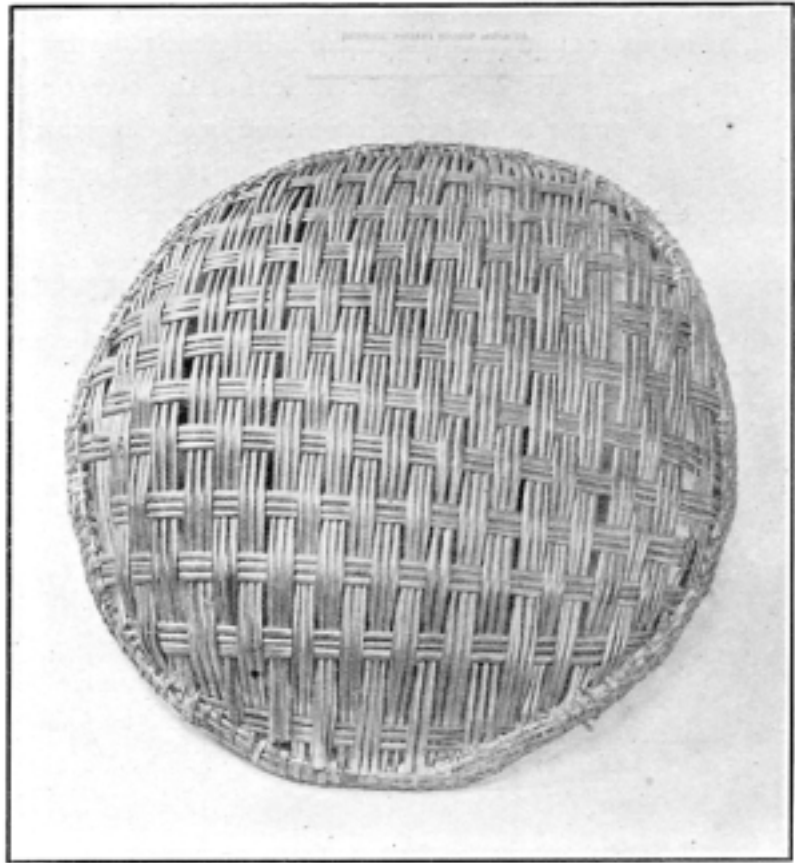


FIG. 35. BASKET FROM SANTA CRUZ.

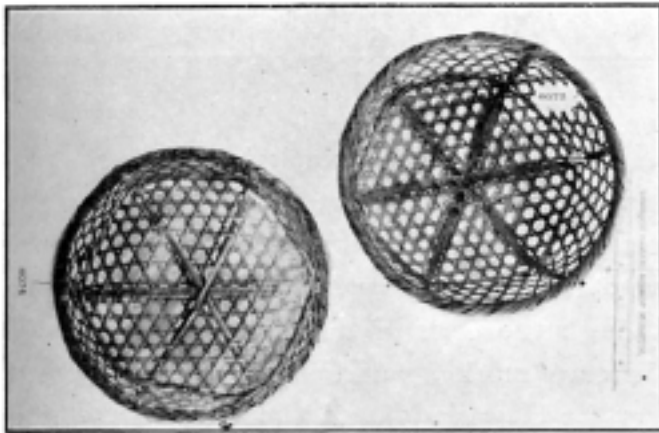


FIG. 36. BASKETS FROM THE PELEW ISLS.

I have seen palm leaf used for the same purpose, and as carefully finished as the strips of palm used for books. I know of nothing of importance in the nature of mats made from palm in Hawaii or the rest of Polynesia, except those of the loulou palm of the Hawaiian group. These are smooth, rather stiff, and are used for beds or for tables. One in the author's possession measures 5×7 ft., and has

thirteen strips to the inch. Another in the Museum, No. 2790, measures 6.5×5 ft., and has the same fineness. They are less durable than the pandanus mats.



**Pandanus Work.**—Useful as the Cocos, King of Palms, undoubtedly is, the pandanus is more used in the Pacific region. For mats it ranks first; and for satchels, sacks, or any construction where flexibility must be conjoined to toughness and durability it generally displaces the stiff leaf of the coco or the harsh and less pliable coir.

Of the genus *Pandanus* there have been described half a hundred species, chiefly found in a region of the Tropics extending from the islands off the East coast of Africa to the eastern limits of Polynesia: a single species has been described from the West



FIG. 37. PANDANUS GROVE IN PUNA, HAWAII (1888).

Indies. There is, however, great uncertainty in the differentiation of these species, owing partly to the difficulty of preserving for herbaria the male flowers and large female fruit resembling a large pine cone, from which the common name “screw pine”, but unlike the pine the pandanus cone falls to pieces when ripe or dried, the keys clinging but loosely to the core. Although the trees of the Hawaiian Islands have all been referred to *P. odoratissimus*, there are marked varieties in the fruit (as the fine red *hua hala*, much prized for lei among the Hawaiians) and the texture and size of the leaves differ greatly, although this may be due to location and soil. In the Micronesian region the fruit is edible and forms an important article of food, while in the Hawaiian group it is not very palatable. Leaves in this Museum from the southern islands are finer and narrower than the Hawaiian, while rolls from Guam cannot be

distinguished from the native product. Much of the uncertainty at present with the genus *pandanus* will soon be removed, by the labors of European botanists who are revising the species, but in the meantime fortunately our study of the use of the leaves in basketry does not depend in the least upon the name assigned to the particular trees that furnish us with the leaves used in these islands.

Forty years ago there were many groves of *pandanus* or *hala* as the native name goes, besides scattered specimens, so there was no need of cultivating the tree like the breadfruit and coconut about the houses, but the increased cultivation of sugarcane has caused the destruction of the native trees, and groves like the one shown in Fig. 37 are now uncommon. The scarcity of leaves and the disinclination of the natives to use those still attainable has made lauhala mats and baskets scarcer than the mats and baskets imported from China, and the native manufacture is journeying towards extinction like so many other industries of the olden time. Puna was

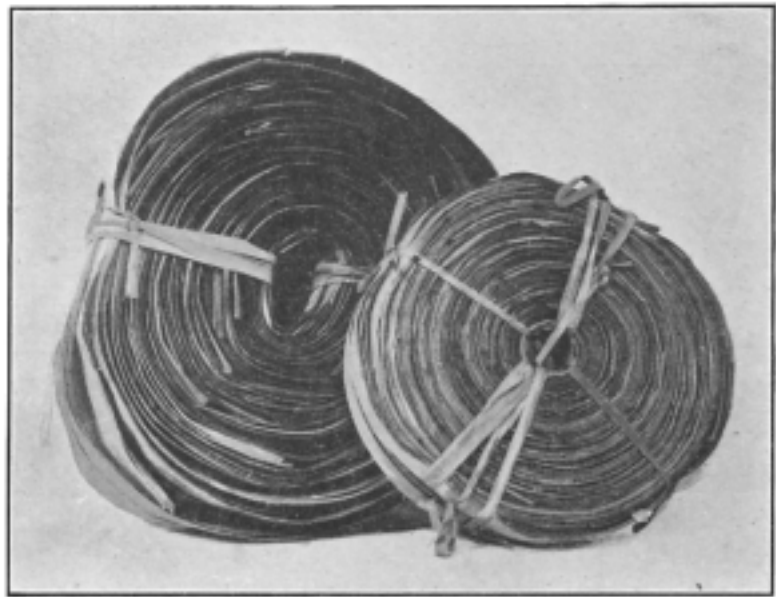


FIG. 38. ROLLS OF HALA LEAVES.

a famous region for *hala* mats, and in 1864 the author, when journeying through the district with that noble missionary the Reverend Titus Coan, saw many a party in the curious open caves (caused by a breakdown of the lava crust in some of the many streams of lava, ancient and recent, that form much of the surface of Puna) busily engaged in weaving mats, a work for which the comparative coolness and dampness of the caves was most suited. A quarter of a century later in traveling the same road with a younger companion the scene was greatly changed: the caves were there, the *hala* trees were there, but the inhabitants had gone, and for sixty miles there was nothing but a few deserted churches and some aged breadfruit trees to tell that once people had lived there. Fifteen years later the scene had again changed owing to the opening of roads and the cultivation of sugarcane, but the present inhabitants were not the old natives, and the mat making is only here and there continued when there is a chance to sell to the foreigner.

In size the hala leaves differ greatly and some exceed 6.5 ft. with a width of 7 in. In the groves like the one figured (Fig. 37) the ground is thickly covered with the deciduous leaves. The base of the leaf which broadly clasps the stem, is cut off and the very prickly margin also removed. This was especially the work of the old women, and as late as 1888 I saw an ancient dame near Kailua, on the western side of Hawaii, continuing the work of her ancestors. She was reputed to have outlived the century mark, cramped in every joint, unable to stand erect, kenneled in a grass hut not four feet high, she was still busily and cheerfully trimming hala leaves with a sharp shell. As I watched her slowly completing her task there came back to my memory

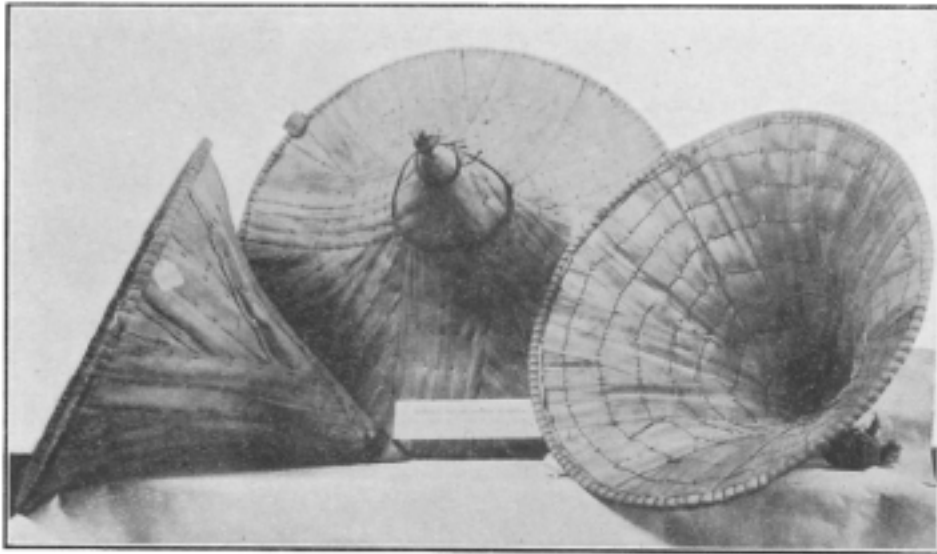


FIG. 39. PANDANUS HATS FROM THE CAROLINES.

most vividly the groups of old women I had seen in Puna doing the same thing while the children gathered up the refuse or laid aside the neat rolls (Fig. 38) into which the prepared leaves were rolled to keep them flat. Drying the leaves was done

in the sun or in the shade to secure the differing tints of brown so ornamental in combination in the more elaborate mats. The leaves are readily split longitudinally, and in mat making strips from  $\frac{1}{8}$  in. to 1.5 in. are used. If the full width of the leaf is needed the midrib must be trimmed down, otherwise the blades on either side are alone used.

**Pandanus Hats.**—While the natives of the Pacific were not a hat-wearing race, on certain occasions some shade or protection was required in spite of the usually thick crop of hair. Such are the long exposures to the tropical sun above and to the gleam from the water beneath in reef-fishing, and from Guam through Micronesia the pandanus leaf is made into a single pattern of conical hat for the fisher's use. Fig. 39 will show the simple structure. The leaves in several layers are stitched together with two-ply coco cord and are bound solidly and neatly at the apex and around the rim. The hats illustrated are from Ruk in the Carolines, but specimens in the Museum from

Guam are precisely alike. They are all nearly of one size (19-21 in. in diameter), and are tied under the chin. The simple vizors of the Fijian and the Solomon Islander answer the same purpose.

From Ebon, Marshall Ids., comes a pandanus mat of neat and curious construction. The leaves are selected of full width, excepting, of course, the prickly edges, and

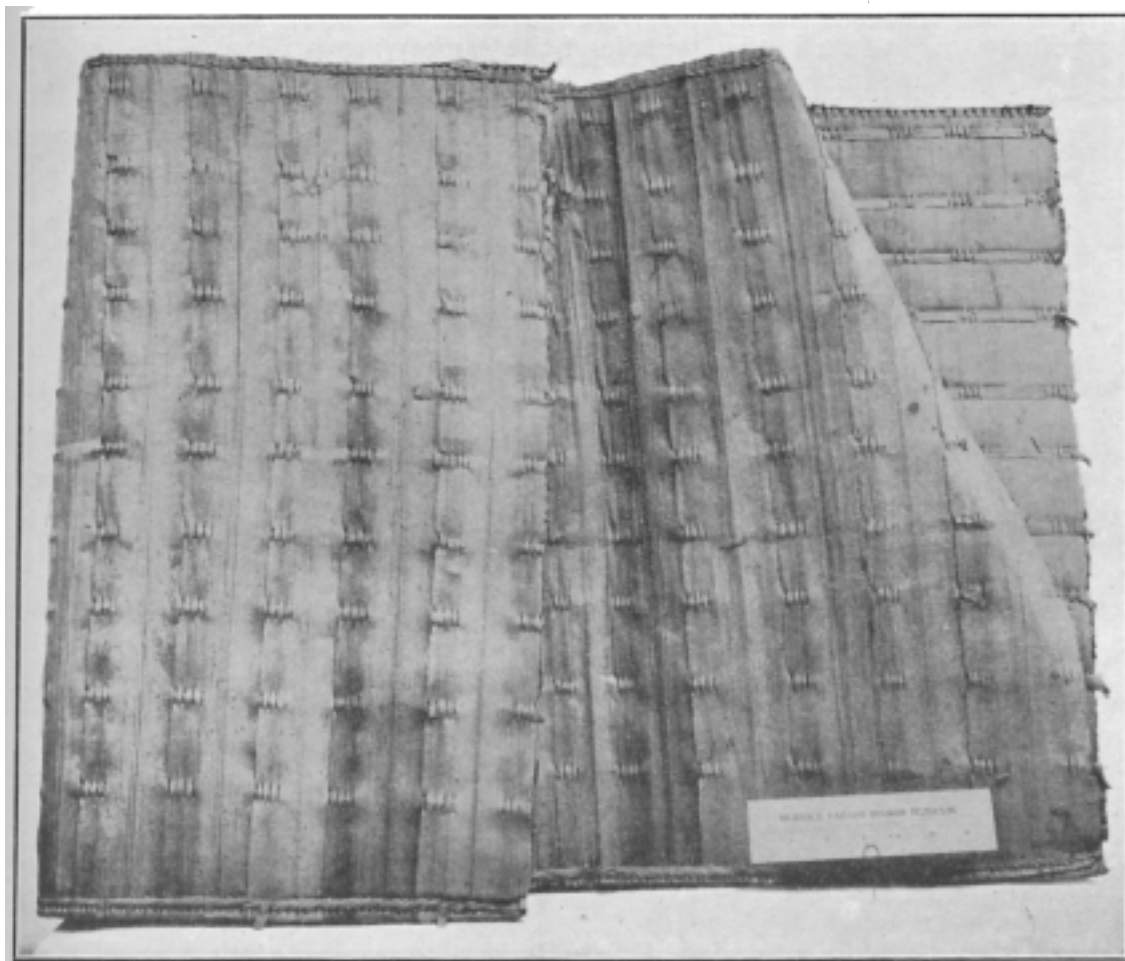


FIG. 40. PANDANUS MAT FROM EBON.

are strung double on strips of the same material,  $\frac{3}{8}$  in. wide. These strips show full length on the inside (see Fig. 40), but on the outside there are four stitches shown, and these come at the edges of the leaves in such a position as to bind them securely together. Between the rows of stitches, and of course between the double leaves, are inserted free single leaves to give body and elasticity to the mat, which in the specimen illustrated is  $25 \times 45$  in. Two of these mats are sewn together by a stout seam of pandanus strip, shown on the bottom of the figure, while the other edge is neatly hemmed, as may be more clearly seen in Fig. 41. The long binding strips are simply

knotted at the end of the mat. This certainly makes a smooth, elastic and very comfortable mat. Those who live in cold climates can hardly appreciate the great comfort in sleeping on a hard surface covered only with a leaf mat. Feather beds, mattresses, spring beds are quite superfluous to one accustomed to roll up his bed when he awakes in the morning.

Another sleeping mat or *sarung* from Shortland Id. of the Solomon group is 6 ft. 5 in. long, and 3 ft. 2 in. wide, made of the same wide pandanus leaves joined at the edges by almost invisible coco cord stitches, and like the preceding in double series

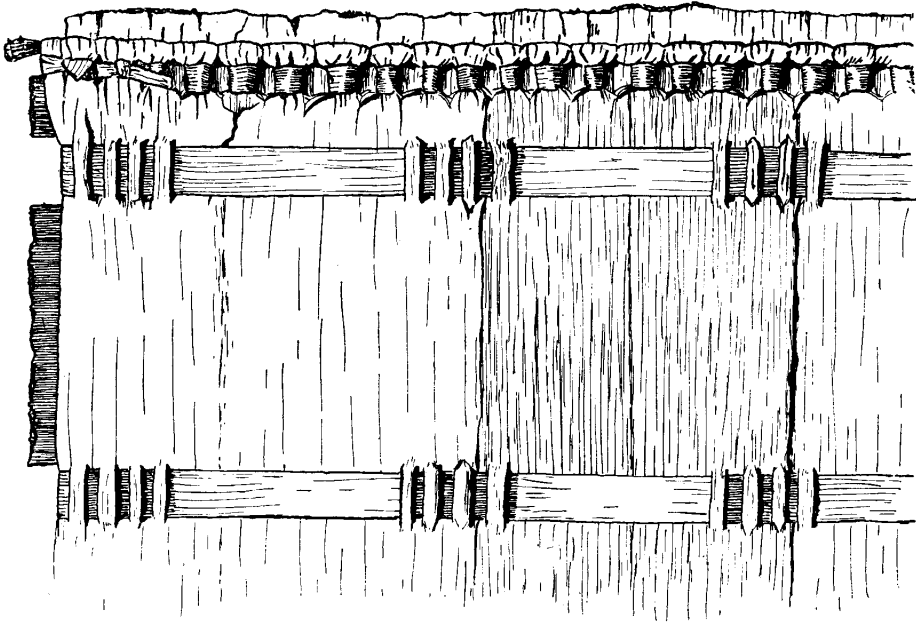


FIG. 41. EDGE OF EBON MAT.

so that the outer and inner leaves break joints. The ends of the leaves are not turned but sewed together by a running seam of coco cord, one cord extending along one side while another is put through the leaf from the other side and over the first cord. The leaves are of great width (6-8 in.) and are sewed together and then turned, a single thread extending the length of the leaf and then knotted and a few loose inches allowed to hang as a fringe. This forms a bed both smooth and waterproof.

The most elaborate of these unwoven pandanus mats known to me are those from the Caroline Ids. which in former times were frequently brought to these islands by the mission vessels from Micronesia. The leaves, as may be seen in Fig 42, or more distinctly in the diagrammatic Fig. 43, are arranged like clapboards transversely to the length of the mat, and are attached to each other as in the preceding example. The leaves, instead of being very broad, are in very narrow strips not over half an inch wide and are placed so closely that only about one-eighth of each leaf shows. As in the first example from Ebon longitudinal leaves serve both to give body to the mat and to bind the whole together. One can see that it would be difficult to roll up such a mat with the ends of these imbricated leaves bound to a stiff rim, and the maker has

ingeniously surmounted the difficulty by trimming the ends of the leaves underneath for about one-third of an inch, the remaining portion being bound with pandanus leaf in several layers sewed on over and over with coco cord. The individual leaves are bound together by untwisted hibiscus fibre, and the whole structure is well adapted for rolling up. In use the unrolled portion is the bed, that remaining rolled up is the pillow, of which the shortest persons have the greater share. These mats are made in different sizes, as may be seen by the measurements of the few in this Museum:

- Sleeping Mat or Lock No. 7835, 49×120 in.; from Ponape.
- Sleeping Mat or Lock No. 3493, 16.2×120.7 in.; from Ponape.
- Sleeping Mat or Lock No. 3492, 18×32 in.; fragment.

Among the fabrics of sewed pandanus are the fine kites of the Gilbert group. Like the Ebon mats already described and figured are the mat coverings for sails when furled, common where mat sails are used, as these sails are too heavy to be easily removed but are more conveniently covered while in the canoe. Models of these are in the Bishop Museum collection of canoe models.

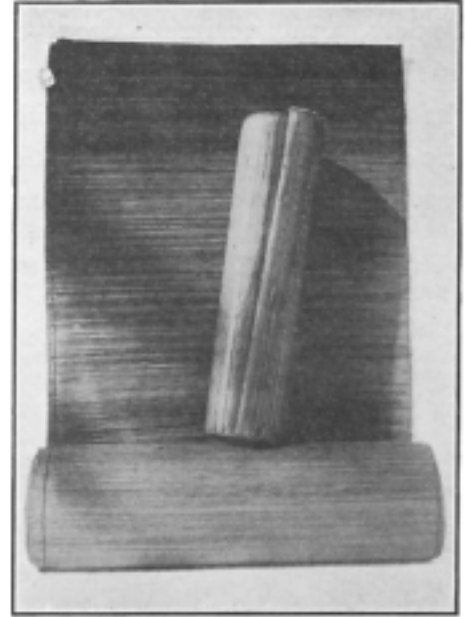


FIG. 42. MAT BEDS FROM CAROLINE IDS.

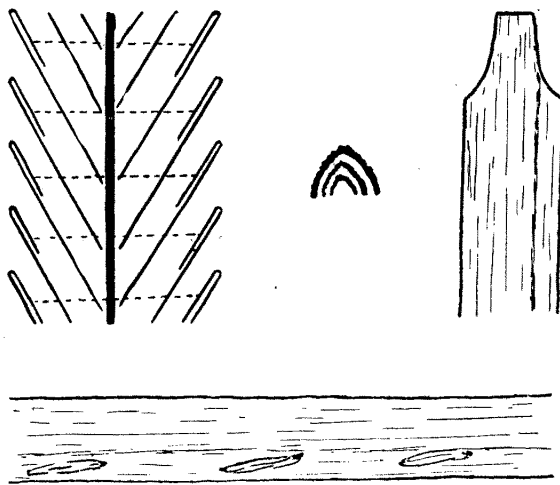


FIG. 43. STRUCTURE OF CAROLINE MAT.

**Pillows=Uluna.**—A simple work of the pandanus weaver were the very comfortable pillows made in the form of a parallelepipedon and stuffed usually with the harder parts of the same hala leaves. Strips  $\frac{3}{8}$  in. wide were usually used in the common forms, but in No. 1144, shown in Fig. 44, a much wider strip is used ( $\frac{7}{8}$  in.) and ornamentation is added by the insertion of darker leaves in the finished pillow. In No. 1147, a specimen from Queen Emma's collection, double strips 1.2 in. wide are used. In Nos. 7732-33 the ends of the latter are of the usual

$\frac{3}{8}$  in. strip and plain, while the rest of the pillow is covered with narrow ( $\frac{1}{8}$  in.) dark strips twilled to form ornamental zigzags or checkers. This covers the whole of No. 7732. After the pillow was woven it was embroidered with the dark strips by

splitting the alternate longitudinal strips into three. In size these pillows vary considerably, as may be seen in the following table:

A small cubical pillow made in the simple pandanus weave served for a ball in the games of many of the Pacific islanders, and specimens from the Hawaiian, Gilbert and Caroline Islands are in the Bishop Museum. These were too light to be thrown to any considerable distance. Descriptions of the games played with these cubic "balls" must be reserved for the chapter on Ancient Hawaiian Sports.

NO.	SIZE.
1144	10×6×4
1145	20×5.2×4.5
1146	10.5×6×3.5
1147	10.5×6×4
1148	13×5×4
1149	10.5×4.5×4
1150	19×5×6
1151	10.5×4.5×3.5
1152	8×3×4.5
1153	7.5×3.5×4.2
7732	9.5×4×3.5
7733	8.5×3.7×3.5

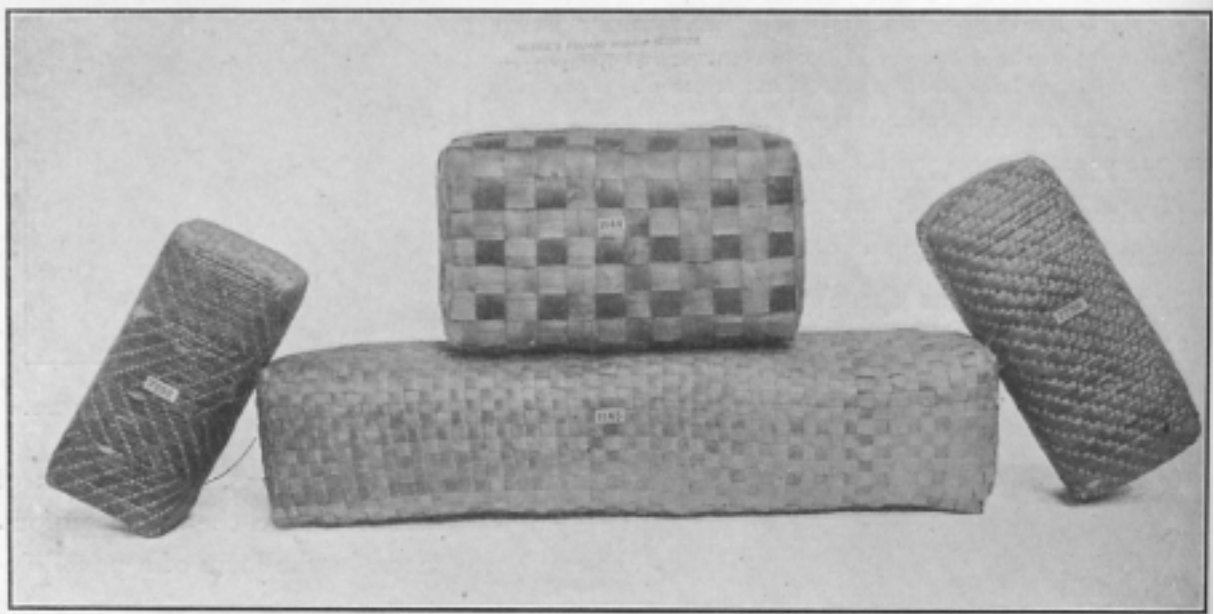


FIG. 44. HAWAIIAN PILLOWS.

**Pandanus Baskets.**—The method pursued in jumping from mat to basket may seem arbitrary, but, as those who take the pains to read through the present account of Polynesian basketry will see, there is no convenient partition between basket and mat; a basket is a folded up mat, or a mat is a basket opened out, especially in the forms most common in the Pacific. As I have grouped the products around the material rather than around the technical process that has been employed, I shall describe mats or baskets as these seem naturally to be in the line of succession.

Among the Hawaiians hala baskets were very common, and in most cases very ugly, as may be seen in the illustrations (Figs. 45-46). That they were found useful their continued manufacture to the present day testifies, and personal use of them convinces me that they are light and durable. In all cases figured the bottom was a square mat continued vertically to a round aperture without change of diameter in



those shown in Fig. 45, the rim being turned and finished in the simplest manner. In the largest, which were used for storage, no handles were provided; in the others cords braided or twisted of coir, oloná or hau fibre crossed the bottom either diagonally or parallel to a side, passing between the weave on the outside once or twice or more, ending in two loops of suitable lengths for handles. In small baskets of this pattern a stiff handle of braid was often sewed to the sides near the rim, as shown in the figure. The dimensions of these baskets, from the specimens in hand, are as follows:

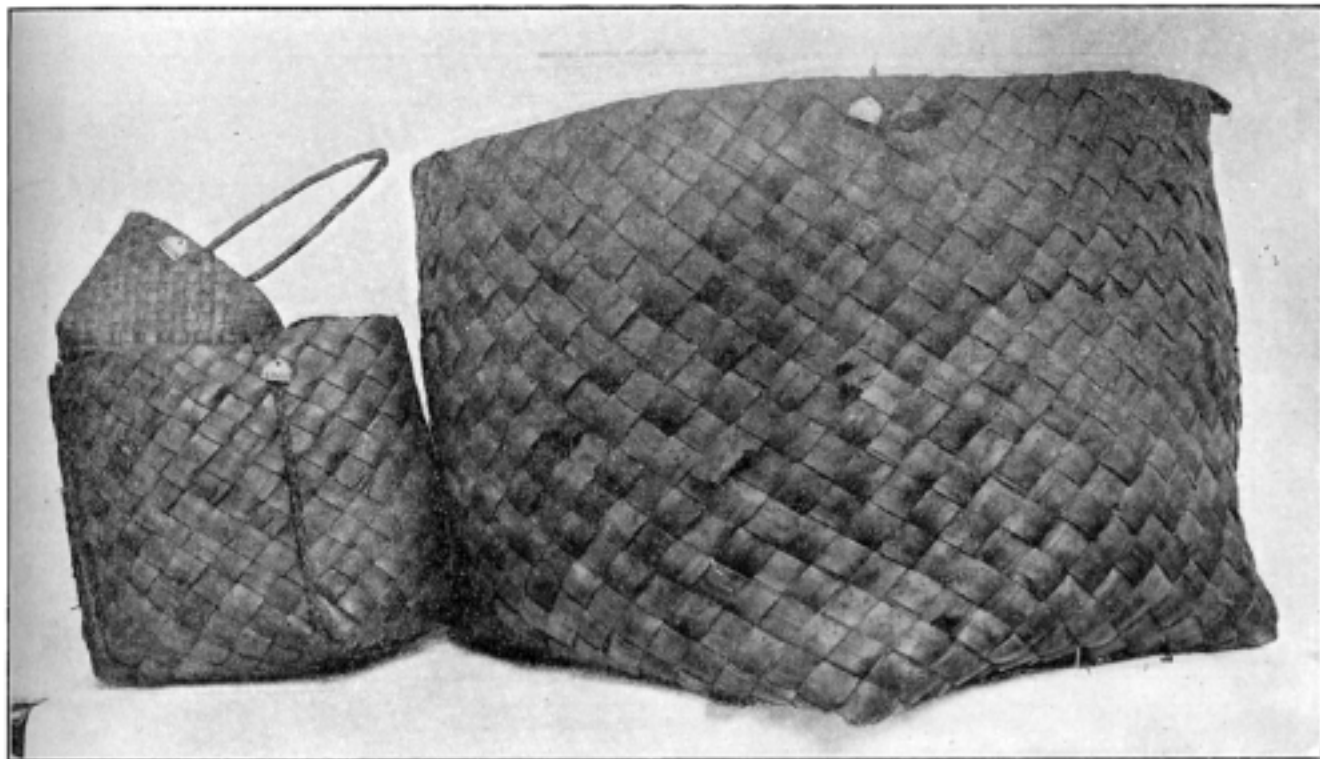


FIG. 45. HAWAIIAN PANDANUS (HALA) BASKETS.

4268. 4.5 in.  $\square$  base; 5 in. high; woven with  $\frac{3}{8}$  in. strips.  
4266. 8 in.  $\square$  base; 10 in. high; woven with 1 in. strips; hau braid handles.  
4255. 16.5  $\times$  19.5 in. base; 17 in. high; woven with 1 in. double strip; no handles.  
4267. 4.5  $\square$  base; 6 in. high; woven with  $\frac{3}{8}$  in. strip; twisted handle.

The covered baskets of this material were even more flabby and shapeless. They were usually made smaller, and were used much as a modern reticule. They were made in the same form of palm leaf as has already been mentioned, and Fig. 46 shows three baskets of pandanus and one of loulu palm. In modern times this form is made only to sell to visitors, and is rarely seen in use. The baskets shown in the illustration are fair specimens, and I was told by old natives in the early sixties that these

were genuine native patterns and not taught by the foreigners. It should be stated in passing that one great difficulty a student of basketry meets in our region where ancient specimens of this perishable ware are not to be found, is the number of braids and patterns taught the natives by foreigners with the laudable intention of improving their manufacture, or in other cases copied without instruction from articles in possession of foreigners. The beautiful flowers made from the stem of the *Tacca pinnatifida*, and the fans equally tasteful, made by the Tahitians, were not native conceptions but were taught by the French Romanist Sisters. The various straw braids used by the



FIG. 46. HAWAIIAN COVERED PANDANUS BASKETS.

modern Hawaiians are another illustration of the foreign grafts. I cannot believe that the primitive forms shown in Fig. 45 are other than purely native invention, and for all I know those in Fig. 46 are equally so. Dimensions and brief descriptions of the baskets of this class in the Bishop Museum are as follow:—

4256. Base 8.7 in. □; 12 in. high; cap 5 in. □;  $\frac{5}{8}$  in. strip doubled on itself to half size where the neck narrows. This is the common way of treating the neck weave and is found in all these examples except one (No. 4263). The handle is formed by a cord attached to the neck; the basket is sewed diagonally on the bottom.
4257. Base 7.5 in. □; 12 in. high; cap 5 in. □; strips  $\frac{5}{8}$  in.; body of double thickness of strips.
4258. Base 8 in. □; 9 in. high; cap 5.2 in. □;  $\frac{3}{4}$  in. strip on bottom;  $\frac{1}{2}$  in. above; hau cord twisted, crossing bottom diametrically inside and up the sides to form

the usual two-loop handle which passes through the cap, thus attaching that part to the basket as long as the cords are unbroken.

4259. Base 7.5 in. □; 7.5 in. high; cap 5 in. □;  $\frac{3}{8}$  in. strip; cords of oloná passed through sides near corners.
4260. Base 4.2 in. □; 8 in. high; cap 3 in. □; strips  $\frac{1}{4}$  in.
4261. Base 6.2×5.5 in.; 7.2 in. high; cap 4×3.5 in.; strips  $\frac{3}{8}$  in. Single two-ply cord up opposite sides and through cap.
4263. Base 13.5 in. □; 14 in. high; cap 8 in. □;  $\frac{1}{2}$  in. strips shaved to half width in narrowing for neck. Cord of braided hau runs through the weave externally

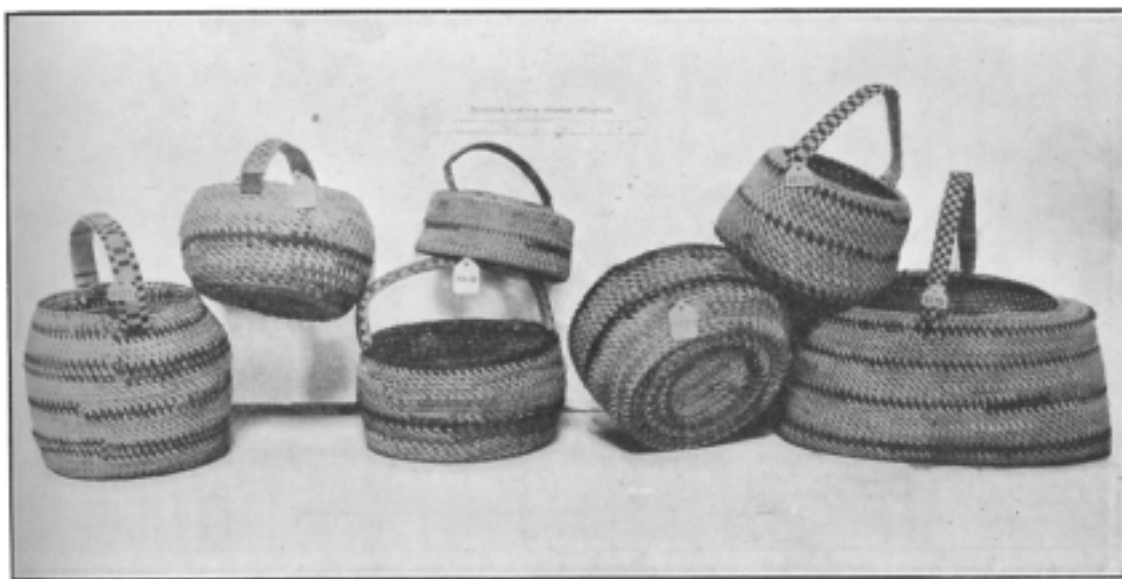


FIG. 47. SAMOAN ROUND BASKETS.

diagonally to the corners and up the sides; loose at base of neck and then through cap at the corners. The arrangement of cord handles is shown in the largest basket in Fig. 46.

4262. Base 5.5 in. □; 7 in. high; no cap; peculiar as having a red embroidered triangle on each side, and a band of the same just below the neck.

A form of basket in the collection, usually called a fisherman's basket, is of like shape with these last, but has a stiff handle and two small cylindrical pockets attached to opposite sides, but I believe that this form is very modern, and of the three specimens within reach not one has been used. They do not seem well suited to their alleged use.

**Samoa Baskets.**—As may be supposed other Polynesians made use of pandanus in basket making, and many of those that have come to us are far more artistic than those made by the Hawaiians. At the same time it must be remembered that

the examples of the handicraft of the latter are of old time and ancient form, while the illustrations that I shall give are almost all of very modern make by the Samoans and Micronesians, which closely resemble these. As I have reason to believe that the examples from the Caroline Ids., shown in Plate I, Nos. 8081, 4024, are at least close copies of baskets made by the ancestors of the makers of the specimens before us, it may be that the Samoans also copied more ancient examples; but my knowledge of the old basketry of the Samoans is too limited for me to form a just opinion on this. I am inclined to consider the round form of the Samoan basket the older, as it certainly is the cruder stage. This is a fair example of the deficiency of information on the bas-



FIG. 48. SAMOAN SQUARE BASKETS.

ketry of the Pacific islanders. With the exception of the Hawaiians no serious attempt has been made so far as I am informed, to trace the stages in the basketry of the Oceanic groups; indeed there are few specimens of old baskets from the Pacific in any of the great collections. For that reason I feel justified in figuring the many non-Hawaiian examples, even if I can add but little to our knowledge of them and their place in basket chronology. The figures of Samoan baskets given by Turner<sup>6</sup> do not resemble any in this Museum, but the scale and want of detail may account for that. According to this learned missionary baskets of pandanus were made by the Samoans before they were taught by foreigners.

All the round baskets shown in the figure are of coiled work, the pandanus (*fala*) being knotted instead of twined. The sizes of the baskets in this Museum are:—

2172. Base elliptical, 11×6.7 in.; 5 in. high; handle flat, checker work; there are four bands of dyed pandanus on the body.

<sup>6</sup> Rev. George Turner, LL.D. *Nineteen Years in Polynesia*, London, 1861, p. 275.

2174. Base 5.7 in. round; 4.7 in high; three colored bands on the body.  
 2177. Base 6 in. round; 5.5 in. high; rather coarse work.  
 8190. Base 6 in. round; 3.5 in. high; a green band.  
 8191. Base 5.7×4.5 in., elliptical; 2.5 in. high; the ornaments and band of red and brown fau (hibiscus) fibre; for ornament portions of the foundation coil are simply wound with the strip and not bound to adjacent coils; handle twilled with red fau and fala.  
 8192. 6.2×5.5 in., elliptical; height 3.5 in.; two bands of purple fau on the body.  
 8193. Base 5.7×5.2 in., elliptical; height 3.5 in.; two bands of red fau on the body.

The last four are quite modern and were given to the Museum by Lieutenant W. E. Safford.

The rectangular baskets are of very different structure from the preceding. The coil is replaced by the plain plaited pandanus, and like the round baskets they bear in Samoa the common name of *ato*. The illustration shows both the form, the peculiar inturned edge, and the attractive decoration, but it does not show the double walls found in all of them. The strips are  $\frac{3}{4}$  in. on the inner basket and edges, but on the exterior are much smaller. By the use of black strips a great variety of patterns is shown, but the black has a tendency to fade to a dull red. The sizes are as follow:—

2175. Base 10×5.5 in.; height 4 in.; divided into two unequal compartments.  
 2176. 11.2×5.5 in.; height 3.5 in.; divided in middle.  
 3566. Base 7.5×4.5 in.; height 3.7 in.  
 3567. Base 7×4 in.; height 3.2 in.  
 6734. Base 5.7 in. □; height 3.5 in.  
 6735. Base 7×4.2 in.; height 3.5 in.  
 7949. Base 6.2 in. □; height 3.5 in.  
 3564. A satchel of similar work and with a flap.

Before leaving the Samoan basketry we may glance at the testimony of several writers as to the methods used by the old Samoans, for they will not fail to throw some light upon the work in similar lines of their relatives on the other groups. It is also interesting to know that in Samoa the basket obtained a sort of vicarious divinity, for on Hawaii a number of gods (*e.g.*, Kukailimoku) were constructed of wickerwork, either plain or covered with feathers. Quoting the Reverend Dr. Turner<sup>7</sup>, "Ga'e fefe was a war-god in some of the villages, and seen in a coconut leaf basket. It is said that in a battle between the gods of Samoa and those of Tonga the former crouched about the trunks of the coconut trees; but Ga'e fefe hid in a coconut leaf basket and escaped while many others were killed. Hence the *basket* became a sign of the god,

<sup>7</sup> Samoa a Hundred Years Ago and Long Before, p. 32. London, 1884.

and no one would step over such a thing, supposing the god might be in it. Hence, also, if, in going to fight, they fell in with a newly plaited coconut leaf basket turned upside down it was a bad omen, and sent them back. If, however, the basket was an old one, and not lying *across* the road, but to the one side, and 'fore and aft', it was a good sign and encouraged them to proceed."

To continue our quotations from the same author (p. 120) in regard to their mats, of which the technic has been recorded more fully, perhaps, than that of any other islanders, he says: "Their fine mats were, and are still, considered their most valuable clothing. These mats are made of the leaves of a species of pandanus scraped clean and thin as writing paper, and slit into strips about the sixteenth part of an inch wide. They are made by the women; and, when completed, are from two to three yards square. They are of a straw and cream colour, are fringed, and, in some instances, ornamented with small scarlet feathers inserted here and there. These mats are thin, and almost as flexible as a piece of calico. Few of the women can make them, and many months—yea, years, are sometimes spent over the making of a single mat. These fine mats are considered their most valuable property, and form a sort of currency which they give and receive in exchange. They value them at from two to forty shillings each. They are preserved with great care; some of them pass through several generations, and as their age and historic interest increase, they are all the more valued." Similar mats used as garments we shall find were made on the Hawaiian group, but of grass rather than pandanus leaf. A portion of one belonging to Kamehameha the Great is shown in Fig. 82, and though more than a century old is still flexible.

Another Samoan missionary, the Reverend John B. Stein, in speaking of Samoan mats tells us:<sup>8</sup> "Of these the most valued were the *ie taua*, and they might well be prized, since they often occupied five, six, nine and even twelve months in their making. They were made from the *lau ie*, a large plant whose leaves closely resemble those of the pandanus, but are larger. When plucked the prickly edges of the leaves were cut off with a shell, and the leaves then rolled up and baked in a native oven. This prepared them for a second process, which consisted of separating the inner or finer part of the leaf from the outer, the latter being laid aside for a coarser kind of mat. . . . The finer portions of the leaf were then strung together, fastened to a bamboo pole and placed in the sea, where they were allowed to remain until bleached, a process usually occupying from five to seven days, when they were rinsed in fresh water and placed in the sun to be further bleached, after which, when thoroughly dry, they were cut into little strips of various lengths and widths, according to the fineness of the plait required.

<sup>8</sup> Old Samoa, London, 1897, p. 144.

“Upon the completion of one of these valuable mats . . . all the women familiar with the manufacture of these mats resident in the neighborhood were summoned on a given day to bathe the mat. On the women assembling they proceeded to wash the mat in fresh water, and after well stretching it out to dry they adjourned to the house to partake of a feast provided by the hostess to celebrate the completion of her mat.”

How clear the picture of these children of Nature assembling on the bank of one of the many Samoan streams to wash the mat which, after perhaps a year's work, one of their number had finished! They all rejoiced, for was not the work an honor to their village, to their sex, to their friend? And if the customs of both children and domestic animals (dogs and pigs) were then as now, the washing must have been more than an idle ceremony. I am well aware that a Samoan house had a low fence across the doorways, intended to keep out pigs, for on this I have sat while chatting with the inmates of more than one Samoan grass house, both on Upolu and Tutuila; but I also know that in modern times at least it is customary to take the growing mat out under a shady tree where both pigs and hardly less dirty children could scarcely be kept from off it. The washing we may be sure was needed. Our author goes on to say:

“There were also at least thirteen other kinds of clothing, sleeping and house mats made by the Samoans.<sup>9</sup> Various dyes were prepared from vegetables and roots of trees. A beautiful crimson was obtained by mixing the inner bark of the root of the *nonufi'afi'a* (*Eugenia malaccensis*) with sea water and lime. Yellow was prepared from turmeric and oil. It was also obtained from the bark of the *nonu* (*Morinda citrifolia*) previously mentioned. A fine purple was obtained from the young shoots of the mountain plantain, *soa'a* (*Musa fehi*), and a brown by mixing the inner bark of the *pani* (?) with sea water. A black colour was imparted to various articles by burying them in the soft mud of a taro patch formed in a swamp.”

Continuing our exploration of the technic of the islanders we find on Fiji, according to Dr. Berthold Seemann,<sup>10</sup> a most trustworthy authority, that “Mats with which the floors of houses and sleeping places are thickly covered, are made of two kinds of screw pines; the coarsest of the leaves of the Balawa (*Pandanus odoratissimus*, Linn.); the finest, of those of the Voivoi (*P. caricosus*, Rumph.). The Balawa, or Vadoa, as it is termed in some districts, is a tree twenty-five feet high, indicative of poor soil, growing in exposed positions, and being one of the first plants appearing on newly formed islands. Its singular habit has often been dwelt upon. The smooth white branches, with their dense heads of foliage, not inaptly compared to the arms of a huge candelabrum; the strong aerial roots, covered with minute spines, and serving as so many props; the curious corkscrew-like arrangement of the leaves, the leathery,

<sup>9</sup> Some of these mats were laufau, lalaga, ie taua, ie 'ula, ie sina and si'aloa.

<sup>10</sup> Viti. B. Seemann. Cambridge, 1862, p. 554.



sword-shaped leaves themselves, and their spiny edges; the long spikes of male, and the shorter branches of female flowers, their delicious perfume strongly recalling to mind that of the vegetable ivory of South America; finally, the bright orange-coloured drupes, formed into large heads of fruit, to say nothing of their insipid taste, appreciated only by natives, are all so essentially different from what a European traveler is accustomed to in his own country, that his attention is involuntarily arrested, and he hardly ever fails to record it. The Voivoi or Kiekie is a stemless species with leaves ten to twelve feet long, which delights in swampy localities of the forests, and is occasionally cultivated to meet the demand. Fans, baskets, and the finest mats—even those on which newly born babes, naked as they are for more than a twelvemonth, are carried—are made of its bleached leaves. Occasionally neat patterns are worked in by introducing portions of the material dyed black, whilst the borders of highly finished mats are tastefully ornamented with the bright red feathers of the Kula—a parrot (*Calliptilus solitarius*, Latham) not found in the groups eastward of Fiji, and therefore highly esteemed by the inhabitants of those islands.”

Turning to the westerly Pacific region, we find in the Solomon Ids., according to Dr. Guppy,<sup>11</sup> still another item in the technic of mat-making. I have not been fortunate enough to see any of the Solomon mats, of which there are a number in the Bishop Museum, that I could feel sure had been treated as Dr. Guppy describes; but his statement is interesting as adding to the methods used in preparing the pandanus leaves. He says:

“Mat-making is one of the occupations of the women of the Straits, the material employed being the thick leaves of a species of *pandanus* which is known by the natives as the *pota*. The leaves are first deprived of their thin polished epidermis by being rubbed over with the leaves of a plant named *sansuti*, which have a rough surface giving a sensation like that caused by fine emery paper when passed over the skin. The pandanus leaves are then dried in the sun, when they become whitened and leathery, and are then sewn together into mats.” Evidently the kind of mat already described from the Solomon Ids., p. 32.

In the Gilbert Ids. we learn from the narrative of the United States Exploring Expedition under Wilkes,<sup>12</sup> “The mats are made of the leaves of the pandanus, slit into strips about a quarter of an inch wide, and woven by hand: these are of two colours, light yellow and dark brown: the former are made from the young leaves, and the latter from the old, which are prepared by beating them with a mallet to render them pliable. On the yellow mats they bestow a great deal more of their attention: the young leaves

<sup>11</sup>The Solomon Islands and their Natives, London, 1887, p. 61.

<sup>12</sup>Narrative of the United States Exploring Expedition during the years 1838–1842, by Charles Wilkes, U. S. N., Commander of the Expedition. Philadelphia, 1845. Vol. v, p. 94.

are laid aside for two or three days after they are plucked, till they are withered: they are then roasted by holding them in the hand over the fire, and afterwards laid in the sun for three or four days to insure them being sufficiently dried. During the latter part of the process they are brought every evening into the house to protect them from the dew or rain. When the leaves are sufficiently dry, they are left all night to bleach in the dew: they are then rolled up in balls and pounded with a mallet to render them soft and pliable, and when this is accomplished, they are slit with a shell and are ready for use."

It may be stated that the pandanus mats of the Marshall Ids. have long been an important article of commerce among the islanders, and the low coral islands of the

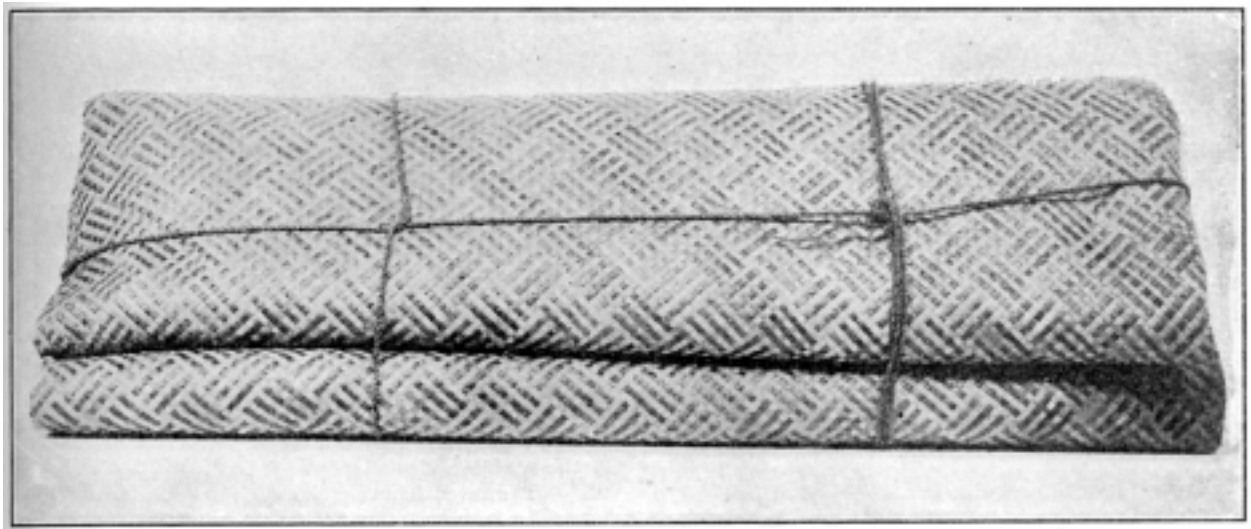


FIG. 49. MARSHALL ISLANDS MAT AS USUALLY FOLDED. NO. 8061.

group are largely dependent on the sale of their mats and the products of the coconut for such things as their low and sandy soil cannot produce. Hence these mats are found on most of the groups in the Pacific, and half a century ago they were often brought to Honolulu in the missionary vessels, and I have at times been led to suppose that they were of native Hawaiian manufacture. While the Hawaiians did make similar mats, those of the Marshall and Gilbert Islanders can generally be distinguished from most other products of the mat makers. The mat figured is one of the better class, and measures 11 ft. 2 in. by 9 ft., with a fineness of four to the inch. The dark and light leaves mentioned by Wilkes are very distinct, and by ingenious combinations yield very attractive mats.

The custom of keeping fine mats for a long time, using them only on great occasions, seems very ancient, and, if the word of some native Samoans may be trusted, mats several hundred years old are now in existence. The Samoan legend of the origin of one of these mats is sufficiently quaint to warrant its translation here, although

it has been translated into German elsewhere.<sup>13</sup> I do not pretend to be a Samoan scholar, but the similarity with the Hawaiian has warranted me in translating the song from the text of O. Steubel.<sup>14</sup> There are expressions of which the meaning can only be guessed at, and even the learned translator into German, Dr. W. von Bülow, has not always been sure that he has guessed aright.

There are several versions of this story; the present one was collected at Safune, and Dr. von Bülow gives another not very different, in the volume referred to. The story is in genuine Polynesian form, and serves to explain the reverence with which certain fine mats are to this day preserved by the Samoans, wrapped in *siapo* and carefully stored among their choicest treasures.

## O LE TALA I LE IE.

O Neefanua ma si ana tama o le pipili ma lona tuagane o Uu (Vaiuu) ma o Ololua (Lolua): ua sau la latou vaa mai Fiti ma lalaga mai i ai o le ie i le vaa.

Ua maua o le igoa o le ie o le Lagavasa.

Uua taunuu ai i Siuutu i Salailua, ua toe lalaga ona toe sauni lea a oo mai i le Itu o tane.

Ua lalaga o le ie, ua pipii ma le eleele.

Ona faaigoaina lea foi o pipii ma le eleele.

Ona fua lea.

Ua sau o le vaa i gatai o Safune.

Ua fai atu Uu, sei nofo o le vaa i tuaau, sei asia o le nuu nei po e i ai o se latou ava.

Ua alu ai Uu, ua tui le ava.

Ona alu ifo lea ona fai atui, oomai ia ua maua o le ava.

Ona alu ai lea o le vaa ua ofi i uta.

Ona fai atu lea Uu, oomai ina oo i uta: au fia nofo i si ou ava.

Ona ua nofo ai Uu ua faatupu maa i totonu o le ava, e i ai o le maa i nei onapo i le ituava sasae.

Ua alu ai o le vaa, ua tuuta i uta, na taunuu ia Tugaga; ua tulia;

Ona alu ane e moe i le fuefue.

Ona toi igoa ai o le ie Ua moe i le fuefue.

Ona latou oo lea i le Ituvai i sasae, ua latou oo i Asu, ua lalaga foi o le ie: ua oo i onapo o le tuaoloa, ua agimai o le matagi, ua sau o le oneone i le fale, oneone ai o le ie. Ona tata lai lea o le ie, ua asuasua, ona faaigoaina lea o le maota o Asu, i le asuasua o le ie.

Ua oo o le malaga o le alii Lealatele o Tanuvasavasamanaia, ua afe i le fale o le Pipili i Safuné.

Ua avaga o le Pipili ia Tanuvasavasamanaia, ua fanau o Tualafalafa o le teine.

## THE TALE OF THE MAT.

Neefanua with her daughter the cripple (hunchback) and her brothers Uu and Ololua came in their canoe from Fiji, and she plaited a fine mat in the canoe.

Then was given to the mat the name Lagavasa (woven on the high sea).

They made land at Siuutu in Salailua and wove the mat again and traveled to Itu o tane.

She wove the mat and the dirt clave fast to it.

For this was the mat named Pipii ma le eleele.

More leaves were to be collected.

The canoe went on to the seaward of Safune.

Then spake Uu, "The canoe must rest on the other side of the reef and a boat-passage must be found in the reef."

Then went Uu to pick out a boat-passage.

He returned and said, "Come, there is a boat-passage at hand."

Then went the canoe through the reef to the land.

"Now," said Uu, "Come, go you ashore while I stay by my boat-passage."

Then stayed Uu there and raised up a stone on the inner half of the entrance, that very night, a stone on the east side of the passage.

The canoe made land and was drawn up on the beach, it came to Tugaga; they went onward.

She went thence and slept in the bush.

From this was the mat called "Ua moe i le fuefue."

She went then to the east side of the stream, and turned to her mat-weaving again. Then arose in the night the southeasterly wind and blew the sand into the house so that the fine mat was full of sand. Then was the mat shaken: thence came the name of the chief's house, "Asu," from the shaking of the mat.

The chief Tanuvasavasamanaia of Lealatele was journeying and came to the house of Pipili at Safune.

Then Pipili married Tanuvasavasamanaia and bore him a girl, Tualafalafa.

<sup>13</sup> Archives Internationales d'Ethnographie, xii, 136.

<sup>14</sup> Die Leute des Tagaloo, p. 144.

(Ua e i ai i nei onapo o le ala o le Pipili i Safune.)  
Usu mai o le alii o Faitala mai Atua ia Tualafalafa,  
fanau Sina fafaga i tua. Usu ifo o Aoee i luga i le lagi  
ia Sinafafaga i tua, fanau Sinamaa Aoee.

Ona gasegase ai lea o Aoee, ona feauina ifo lea o  
Sina maa Aoee e alu ai i le gasegase o lona tama; ua  
faaputu toga ua ootai o le teine i lona tama, aua o le  
gafa ua ta i le lagi.

E i ai o le upu, "O le gafa ta i le lagi."

Ua fai toga. A ua muimui Tualafalafa, aua ua leai  
soona faitoga; a afifii lava i le aluga o le ie, ua igoa  
tele.

Ua oo i le aso na tele ai toga, ona tatala loa lea  
o le ie:

Ua uila ma pogisa ma faititili ma afa sasa ia o le ie.

Ua ofo o le toatele o tagata, ua latou faaigoa ai o le  
ie ia Tasi e afe.

O le uiga o lenei igoa: Ua tasio le nei ie, a ua afe  
toga ua mauai.

Ua tea i le lagi o le ie.

Sa tepa ifo nei o Sina maa aoee ia Tooalo i Manase,  
ua to tigapula, ua sili i le tua o se ie ula.

Ona tagi ai lea o Sina maa aoee i lona tama, ona oo  
ane i ai lea o tama toalua o Ale ma o Ua faafuasei late  
momolia o le teine i le alii, ua fia fai tane ai.

Ua to o Uafaafuasi, tago loa Tooalo, sei o le ie ula  
e tu i lalo o le maa, a tu loa o le teine o Sina maa aoee,  
ua tepa atu, ua leai o se ie ula; ona fesili lea o le teine:

Alii e, oifea o le alii, sa tootoo lona tigapula?

Ua tali atu Tooalo; O au lava lenei.

Ona oso ai lea o le teine, o lea e au i le vai, a ua  
afisi i lona aoao o le ie.

Ua tatala o le ie, faa ua susu.

Ua iloilo, ua mago lava.

Ona faaigoaina lea o le ie ia Matumaivai.

Ua nofo Sina maa aoee ia Matilafoafoa, ua fanau  
o Sinataeoilagi.

Usu Tooalo ia Sinataeoilagi, fanau Sinaautuimo.

Usu mai Leuluialii ia Sinaautuimo, fanau Muliaga  
ma Matagitausulu.

Usu mai Tuisamoaia Matagitausulu, fanau Nonu-  
maufe.

(There is to this day in Safune the street of Pipili.)  
The chief Faitala mai Atua married Tualafalafa and  
begot Sina fafaga i tua. Aoee came down from heaven,  
married Sinafafaga i tua and begot Sina maa Aoee.

Aoee was ill, and Sina maa Aoee was sent down  
from heaven to cure the illness of her father: fine mats  
were collected, and the daughter goes to her father; so  
it was the genealogy towered toward heaven.

Thence comes the saying, "The genealogy is from  
heaven."

Mats were collected and Tualafalafa murmured be-  
cause her mat had not assisted. Therefore was the mat  
with many names made into a pillow.

As now many fine mats were collected, the mats  
were lying unfolded.

Lightning and darkness, thunder and hurricane  
were the omen of the mat.

Astonished were the people, and they called the  
mat "One of a thousand."

The meaning of this name is: One is this mat, a  
thousand would balance it.

The mat so came to heaven.

Then looked Sina maa aoee upon Tooalo in Manase,  
he was planting a taro top and wore on his back a red  
(feather) mat.

Then did Sina maa aoee call to her father, and he  
brought two youths, Ale and Uafaafuasei, for the  
maiden longed to get the chief for a husband.

Then fell a sudden rain and Tooalo caught hold of  
his feather cloak and hid it under a stone; then at once  
stood the maiden Sina maa aoee before him and beheld  
him without the red cloak; then asked the maiden:

"O Chief, where is the chief who plants taro?"

To her replied Tooalo, "I am he."

Then plunged the maiden into the water, and swam  
through the stream, taking the mat in her armpit.

Then was unloosed the mat, lest it be wet.

It was examined and found quite dry.

Then was the mat called Matumaivai (dry in the  
water).

Then Sina maa aoee dwelt with Matilafoafoa and  
Sinataeoilagi was born.

Tooalo married Sinataeoilagi and begot Sina-  
autuimo.

Leuluialii married Sinaautuimo and begot Muli-  
aga and Matagitausulu.

Tuisamoa married Matagitausulu and begot Nonu-  
maufe.

We can picture to ourselves the Samoaan woman sitting beneath the shade on the bank of a stream singing this ancient song as she, too, tries to weave the fine mat which may be kept in memory of the maker long after her earthly pilgrimage had ended. The red mat in the song is supposed to be covered with the feathers of the Fijian *Calliptilus solitarius*, Latham, feathers greatly valued but not found on Samoa. The father of Sina maa aoee was the rain god, hence his sending of the lesser gods to pour the sudden shower which caused Tooalo to hide his precious cloak from the rain.

**Mat Sails.**—In the Director's Report for 1899 (p. 25) is an essay on the Mat Sails of the Pacific, by Mr. John F. G. Stokes, now Curator of Polynesian Ethnology in the Museum. This is a very complete and accurate compendium of what is known of the ancient sails, and as these were generally made of pandanus mat by a method of weaving differing from that used in the construction of the broad sleeping mats, we may quote here that portion relating to this work: "The sails throughout Micronesia were always made in strips varying in width from four inches to three feet, the Micronesians being particularly apt in this form of mat-making. The Marshall Islanders, who are among the most expert canoe builders and sailors in the Pacific, use a lapboard, cut from breadfruit wood, on which the mat is woven (Fig. 50). The board is arched and sets very comfortably in the lap of a person sitting on the ground. The

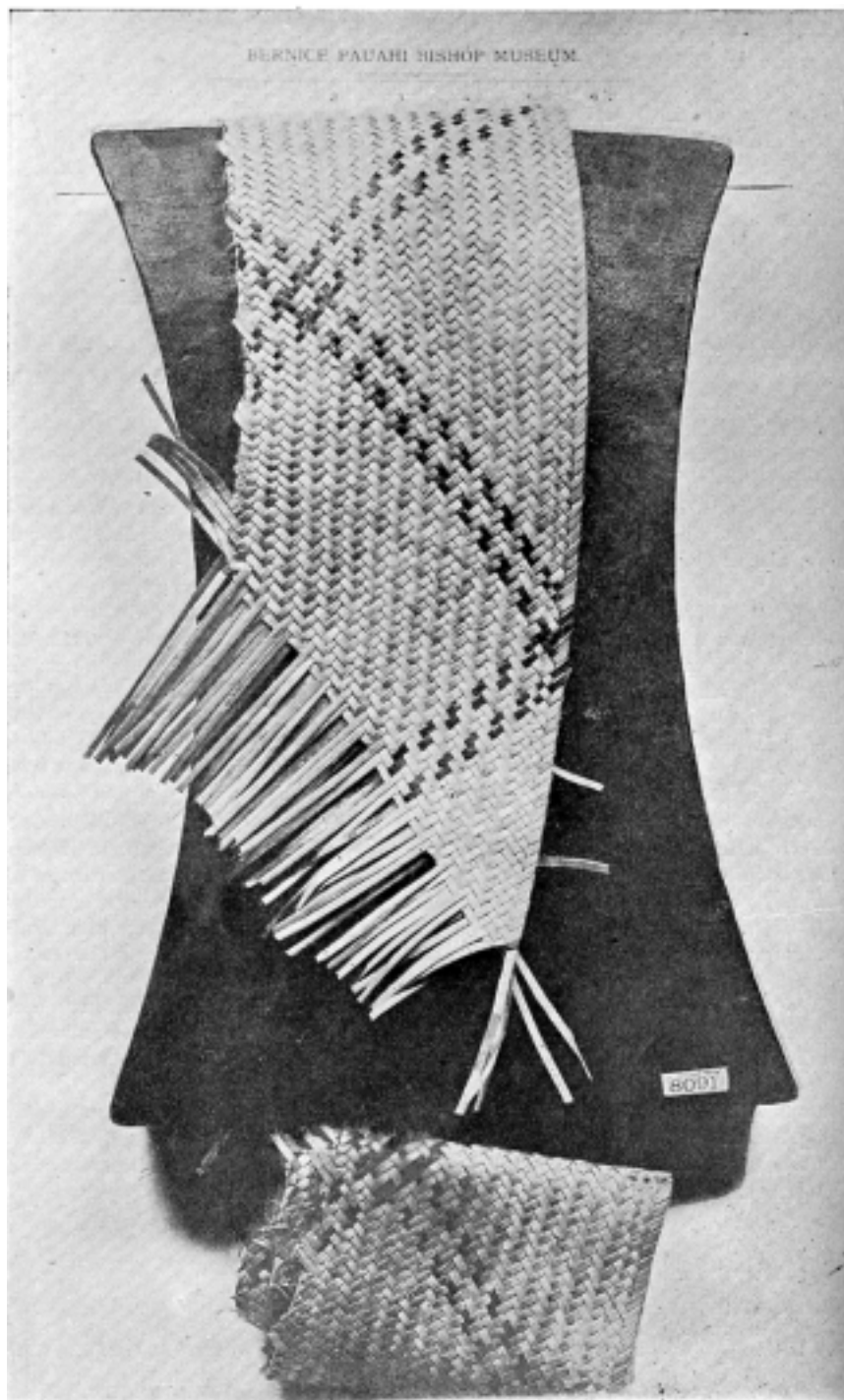


FIG. 50. LAPBOARD AND STRIP OF MAT SAIL.

strips of matting as woven are passed from the board and neatly rolled up. The strip of mat has four dark strands of dyed hibiscus fibre woven in on top of the usual strands of pandanus; this is a favorite method of ornamentation among the Marshall Islanders. The weaving commenced on the left side, and the strands were cut to about twenty inches in length, being long enough to pass around the three strands of pandanus used to form the border at the right and reach the left edge again, where after being woven in about half an inch, they were trimmed off. It might be noticed that at regular intervals along the left-hand border some strands were allowed to protrude; at this edge, as stated, the fresh strands were applied, and when secured four ends out of every seven were trimmed off, the three remaining butts being left to guide the weaver in inserting the black ornamental strands. This strip is 4.7 in. wide, while the breadth of the strands varies from  $3/32$  to  $1/8$ .

“Having woven a great length of sail mat the strips were placed together with edges overlapping and sewed with a thread made from coconut fibre or twisted pandanus, the edges of the strips, on the edges of the sail being turned under and double sewed with the coconut fibre, which material is also used to bend the sail to the spars. A sail made in this fashion is very strong and will stand a great strain. It is about twice as heavy as an ordinary mat, and little heavier than canvas, and if wet becomes dangerous to use if suspended from the mast. The Micronesians, in a rain storm, prefer to lower the sail and roll it up in an envelope of pandanus or banana leaves which they generally carry for that purpose. The Hawaiian sail was made in strips, but that of Tahiti seems to have been composed of several large square mats sewn together, and could not have been a very strong combination. In all cases the work of weaving devolved on the women, while the men attended to the sewing and shaping of the sail.”<sup>15</sup>

Narrow strips of matting like those made for sails were woven by the Samoan women for the game of *Lafoga* (pron. lafonga), in which it served as a sort of alley. These mats were about 7 in. wide and 17 ft. long. Two of these mats and a complete apparatus for playing this interesting game of skill are in the Bishop Museum, the latter the gift of Lieutenant Edw. E. Goodhue, U. S. N.

**Satchels of Pandanus.**—A form of pandanus weaving from Micronesia and Fiji must now be noticed, of which there are examples in most large museums. Four from the Gilbert group are shown in Plate II, Nos. 7096, 7095, 7094 and 3349, and there it may be seen that they are formed like the mats previously described from Ebon, of broad leaves which are split in places to receive the small black strips which serve both as ornament and binding.

I do not know the exact use of these satchels, and the carrying capacity of those

<sup>15</sup> Occasional Papers, vol. i, no. 2, p. 26.

from the Gilbert Ids. is very small. They come to the Museum labelled "Basket for books," and if this is their only use their origin must be recent, for it is not many decades that these islanders have had any books to put into them. On the other hand those of similar shape from Fiji are certainly ancient, some specimens in the old Marine Museum at Salem, Massachusetts (now Peabody Academy of Science) dating from the early years of the last century when the cannibals of that group had no books.

While all the satchels in this Museum from the Gilbert group are made of broad leaves sewed together and not interwoven, the embroidery of black or red strips

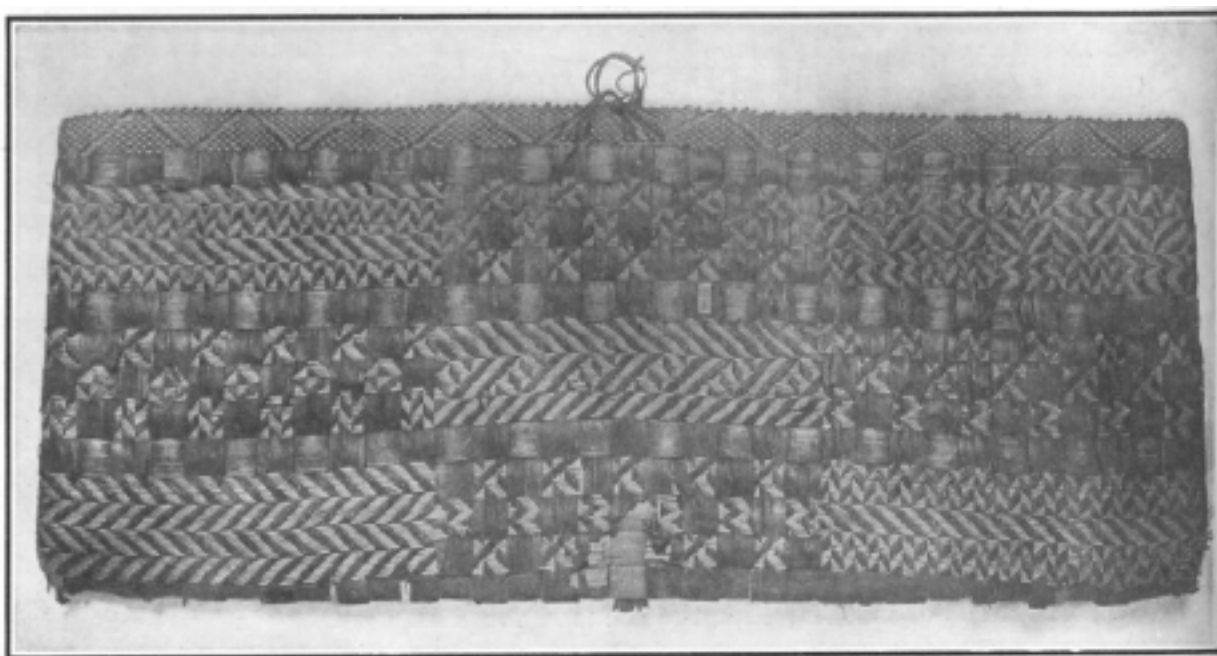


FIG. 51. PANDANUS SACHEL, FIJI.

being inserted by splitting the leaves as needed and after the basket is put together, those from Fiji are genuine mat work with broad strips, the embroidery being by the same method in both cases. In the Fijian satchel, No. 8198 (Fig. 51), the small strips inserted obliterate the irregularities left by the alternate raised and depressed squares in the weave of the satchel and leave a uniform surface. This is especially noticeable in the band along the upper edge. In the Fijian satchel the bottom and edges are continuous and not sewed as are the bottoms of those from the Gilbert Ids. There is a fine series of the Fijian satchels in the Salem Museum, better, I believe, than elsewhere. The dimensions of these satchels in the Bishop Museum vary considerably and are as follows:



8349. 8.5×7 in.; coarse; upper border of finer mat work. Gilbert Ids.  
7094. 6.7×6 in.; a continuous band sewed at bottom, and bound at top; red and black strips. Gilbert Ids.  
7095. 12.5×6.5 in.; a double thick folio sewed only at bottom; has two bands of embroidery. Gilbert Ids.  
7096. 11.2×9.2 in.; continuous band, sewed at bottom; two bands embroidered. G. I.  
8198. 34×14 in.; woven with inch strips; inside plain; outside mostly covered with embroidery. Fijian.



FIG. 52. MARSHALL ISLANDS MAT.

The Fijian specimens at Salem vary in length from 32 to 17 inches. In style of decoration they are well represented by the specimen in this Museum, already figured.

**Mats for Clothing.**—Although the Hawaiians certainly used mats for clothing, not only as wraps, but as waist cloth (*malo*), the principal development of clothing made of mat work, that is woven of grass or leaves instead of finer fibre, was on the Marshall Islands. The beautiful work of these islanders is familiar in all museums, and much has been written about their manufacture and use. I do not here intend to treat these mats from the point of the designer, for the various bands shown in the figures here given have names and appropriate uses. For all these I must refer the student

to the most complete account known to me, that of Prof. Dr. Augustin Krämer;<sup>16</sup> but for the technic of the mat making I shall take the liberty of translating from this interesting paper. As the orthography of the names of the mats and their parts seems wholly unsettled, even German writers not agreeing among themselves, we may pass over the native names and their etymology. The illustrations given here of these mats are all from the Bishop Museum collection, except Plate V, which is made from a large mat long used as a table cover by the writer, who has thus had an opportunity to test the durability of these admirable mats. Nearly all here figured differ more or less from those figured by Dr. Krämer, and many of them are of considerable age.

I translate freely from Dr. Krämer, omitting much of the philological matter as, however interesting and valuable, foreign to our present purpose.

"Among the productions of the Marshall Islanders doubtless the mats used for clothing take the first place. . . . These were made freehand without apparatus or loom, only a long pointed

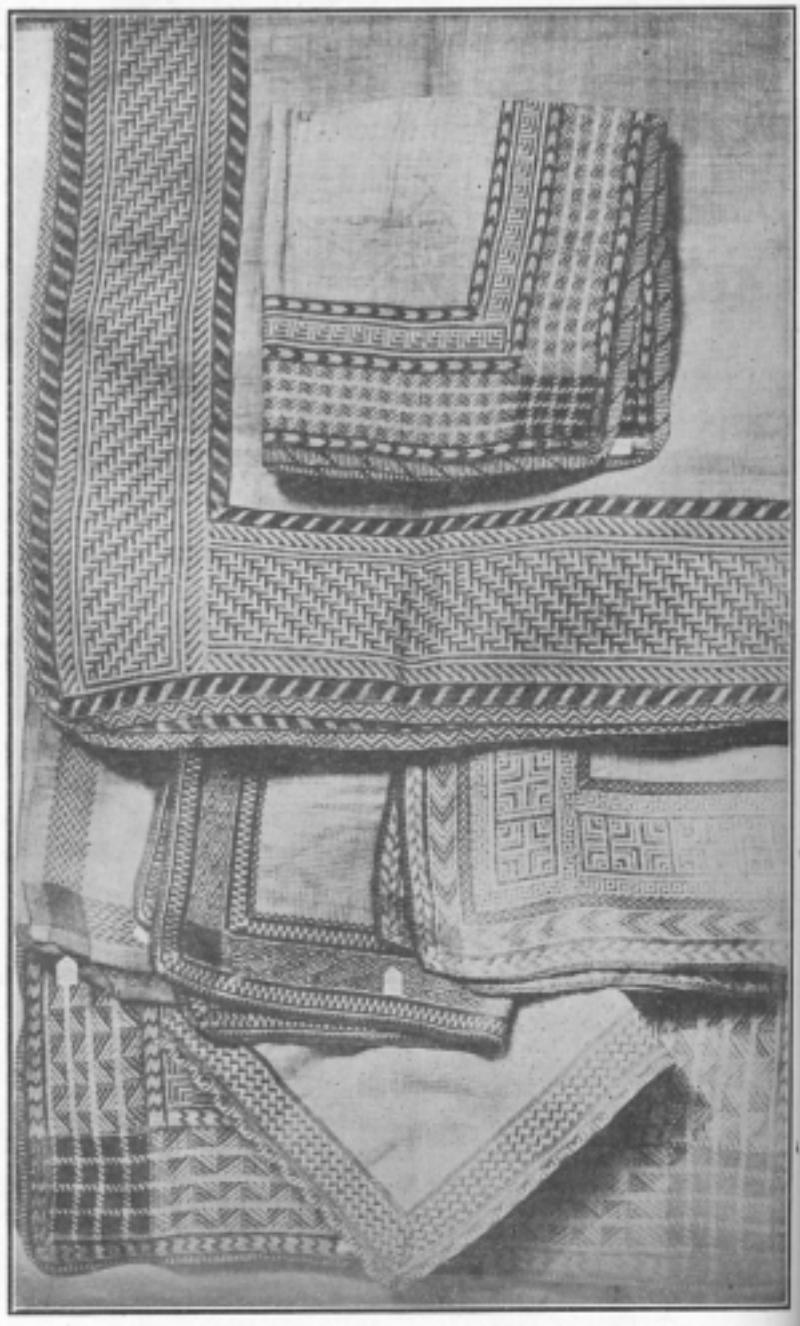


FIG. 53. GROUP OF MARSHALL ISLANDS MATS.

<sup>16</sup>Die Ornamentik der Kleidmatten und der Tatauierung auf den Marshallinseln nebst technologischen, philologischen und ethnologischen Notizen. Archiv für Anthropologie, Neue Folge, Band II, Heft I. Braunschweig, 1904.

weaving needle, called *oea*, generally from the long wing bone of the albatross, serves to lift up the strands which are woven on a lapboard of breadfruit wood one to two feet long and six to twelve inches wide, called *digenat*. [A similar one is figured in the section on Mat Sails, p. 46.] For the embroidery a needle of human, dog or fish bone; for trimming the leaves a pinna shell, *djabor*. All these things are kept in a basket woven from coco leaves called *bodjo*. For the mat the leaves of *Pandanus odoratissimus* are used. For the fine mats these

5650

7109

7832

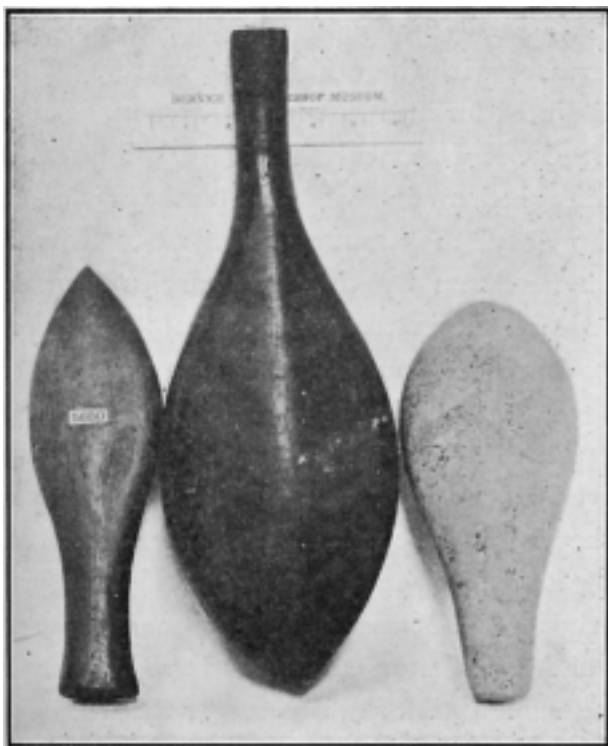


FIG. 54. MALLETS FOR BEATING PANDANUS LEAVES.

are plucked young and roasted over a fire; for sails or coarse mats the older leaves are selected and left to dry in the sun, and then beaten with a hard mallet, *draggeinia*, of *Tridacna* shell [see No. 7832, Fig. 54]; the beaten leaves are rolled into bundles [like those shown in Fig. 38] and laid aside for occasion.

“When the weaving begins, leaves are taken four inches wide and three to seven feet long, and slit into strands which have various names according to their width, as *ajelar*, three fingers wide, *ajennen* thumb-breadth, *djelerik* still thinner ( $3/16-5/16$ ), and *rua* the finest ( $1/16-3/32$ ). The red fibres are from a creeper, *Ficaria ranunculoides*, called *adad*. The bark of the thinner

shoots is stripped off, scraped and freed from the epidermis and dried; the bast then assumes a brown or reddish-yellow hue. The black fibres here, as on other islands, are from the bast of *Hibiscus* dyed with soot or mud. According to Finsch the black dye is obtained from the fruit of the mangrove. These are grated and boiled in marine shells or coconut shells and the bast is soaked in the decoction until the desired tint is obtained. For a red color the same strips are passed through a dye made of the root bark of a certain tree (*Morinda citrifolia* ?) with the addition of lime.”

After describing the sleeping mats, which were arranged much as in Hawaii, the coarser weave at the bottom and the finer at the top of a pile often four to six inches thick, the bottom ones being sometimes of coco leaf, Dr. Krämer describes very fully the fine clothing mats, of which class we have illustrations before us. (Figs. 52-3.) It is unnecessary to go into the analysis of the ornament with the Doctor, but his ex-

planation of the way of wearing these rather uncouth garments, which are fast giving place to the foreign cloth loose gowns, may well be noticed. There are two distinct ways of wearing them: either two mats, one in front, the other behind, are worn as aprons and fastened around the waist with a coil of the interesting coco and pandanus cord already described, a coil that is often sixty feet long (and Finsch reports one fifty metres long), or a single mat is passed between the legs and the corners brought over a similar girdle forming a sort of malo, an arrangement that would seem to preclude any rapid running by the wearer.

The thickness of the cord girdle increased with the rank of the wearer. There were also in these mats (called *ir*) patterns suited for men, others for women, some for commoners, others for chiefs, all of which Dr. Krämer fully describes. These mats were often given as presents, and in the early sixties some of the Marshall Islanders made a large one suitable for a bed cover which they sent as a present to Kamehameha V in recognition of the good done for them by the missionaries from his kingdom of Hawaii. On the voyage from Micronesia to Honolulu rats destroyed a corner of the elaborate border, and the partial ruin was purchased by the writer and is now in the Peabody Museum at Cambridge, Mass. When the use of mats for garments ceases, as it will very soon, it is questionable whether they will still be woven. For table covers they are well suited, as well as for other purposes of domestic ornament or use, and it would be a pity that they should be relegated to the class of lost arts. It cannot be denied that mat weaving here, as elsewhere in the Pacific, is rapidly declining, owing largely to the unwise method of instruction that has been in vogue throughout the Pacific where the methods of Anglo-Saxon education have been forced upon peoples generally unable to assimilate such intellectual food. If the white men had simply endeavored to make better specimens of the various races, saving what was good in their work, gently eradicating the heathen tendencies, it seems possible that many of the useful industries of the Pacific might have been saved from the list of abandoned arts. The pandanus and makaloa might still be fashioned into fabrics which would bring revenue to the makers and credit to the islands of the Great Ocean.

**Hawaiian Lauhala Mats.**—Enough has already been described of the methods of other Pacific islanders perhaps to render superfluous any minute description of the ways and means of the old Hawaiians in lauhala mat making. Doubtless it was the oldest form of mat making on these islands, and fragments are found in the most ancient burial caves quite like the mat work of the present day. No such work as that just described from Micronesia was made here, perhaps because the use of kapa for garments rendered their use for clothing unnecessary; but it must not be supposed that the old Hawaiians did not make fine pandanus mats, for there are suffi-

cient witnesses to the fact in the cases of the Bishop Museum, where most beautifully regular and finely woven mats are in considerable number.

As to the legendary origin of Hawaiian mats I can give no information. Not only have the modern natives preserved no remembrance of the songs or legends of any such theme, but unfortunately the present writer neglected to take down from the lips of the old women who, in the middle of the last century, were singing such songs as they plaited the mats in the Puna caves, songs which undoubtedly related to their early predecessors in the mat making work; he also neglected to ask what were the tutelar gods of the craft, and today the remaining natives are unable or unwilling to give the ungathered information. We only know that the Hawaiians had among "the forty thousand and four hundred thousand gods" one or more especially worshipped by the pious artisans in basketry of former days. We also know that they had songs and legends of early mat or basket makers who were famous at their craft, and were perhaps apotheosized by their successors for their skill. The teaching of a new religion seems to have driven from their thoughts many things worth remembering while by no means strangling the superstitions of the neophytes. Their love for the recital of *mele*, which was quite oriental and kept alive in their memories the doings of their forefathers, their genealogies, and the rules of life, has largely disappeared from this group, and aimless political discussion or modern tales of a very different nature have usurped its place.

Leaving then the folklore and poetry of the basket and mat makers untold, we must present their work, which is so like that of all the other Polynesian groups that it hardly deserves an extended paragraph. The hala leaves were gathered, they were dried either in the sun or in the cover of the house, were scraped, trimmed and beaten, then rolled and stored until enough and more had accumulated for the intended mat. The shell trimmer was that used everywhere, but the mallet was not like those figured from the Marshall Islands (Fig. 54), but either a plain round club (*hohoa*), or more commonly an old kapa beater (*ie kuku*), of which the engraved sides had become smooth from long use. These four-sided clubs with rounded handles were common all over the group, as they were necessary utensils in every family, and they are to be found in most ethnological museums.

I have asked a skilful maker of lauhala mats, still resident in the once famous mat making district of Puna, to make for me the first few inches of a common mat, and the result is shown in Fig. 55. To show her good will as well as skill she has embroidered her own name and address on the obverse of the figure, and my name on the reverse; but in spite of that fancy the specimen shows perfectly well the beginning of the weaving. No vestige of a loom, not even pegs to hold the row of leaves in place is needed, but a sufficient number of hala leaves is taken to cover the width of

mat desired, and these are strongly sewn together as shown in the figure. The splitting into strands of the selected width is then done and the plaiting begins. Each strand passes diagonally to the edge of the growing mat and then turns and continues its journey at right angles to its former course until it reaches the other side, or is continued by a succeeding strand which is neatly inserted under the overlapping transverse strand. The skill with which the weaver keeps the long strands from hopeless entanglement and puts each in its destined place is surprising to the uninitiated. To



FIG. 55. THE BEGINNING OF A MAT OF LAUHALA.

the success of the mat the weaver's fingers must put the right tension on each strand or the mat will be bellied or warped, and will not lie flat or be rectangular when finished. An inexperienced or careless mat maker is always known by the irregular mat. While the whole leaved edging is sometimes left on the finished mat, it is usually cut off when the distal end has been bound in.

The size of these mats was unlimited, except by the use to which they were destined. Often they extended quite across the house, and when intended for covering canoes might be eighty to a hundred feet long. Long and narrow ones were used for a table at an *ahaaina* or feast; a moderate sized one in the Bishop Museum, made for this purpose, measures 3 ft. in width and is 28.7 ft. long (No. 2583). It was not uncommon to weave in coarser mesh or strand immense mats to spread on the ground for

seating a large company, and I have seen in old native churches mats many yards square covering the whole floor, there being no pews or seats of other nature. From their size and weight they were seldom removed, and often became unsanitary, according to modern ideas.

The bed mats have been several times referred to, but they may be more fully described here as a series of mats woven, in the best houses, to fit an allotted place, and arranged in accordance with their fineness from the coarsest, which rested on the gravel floor of the house, to the fine mat on top that showed the wealth or taste of the owner. To keep the mats in place (and as the whole family slept on the same bed, and some of the bedfellows might be uneasy from overfeeding, this was no simple matter) mats of the *hikiee* were sewed together along one edge, and this edge generally raised by the interposition of strips of the same matting.

Matting of the lauhala in coarse weave, one inch strands or larger, were in constant use to cover property from the sun or sudden showers, to spread nuts or herbs upon while drying in the sun, and to wrestle on in an indigenous form of that manly exercise, where the contestants clasped hands and, without touching any other part of the body, endeavored each to push the other off the mat. In the early days of the American Mission on these islands the simple homes of the missionaries were generally carpeted, if at all, with lauhala mats woven to fit the room, and examples are still extant of mats of great beauty given by early converts to their respected teachers.

**New Hebridean Dresses.**—On several of the islands of the New Hebrides, a group using the loom, and famous for fibre weaving, are found dresses of finely cut pandanus, so closely resembling grass work, that until the material was considerably magnified the author was inclined to class them with the makalooa mats of the Hawaiians. As will be seen in Fig. 56, they are aprons of no generous size (some are hardly two inches wide), but the peculiarity of their openwork weave recalls the Tongan mats of the opposite side of the Pacific. These aprons are worn by the women by means of some sort of belt, and on some of the islands are stained a magenta red which does not add to their beauty in the eyes of a foreigner, and almost conceals the openwork patterns. Some of those from Malekula have been washed until the pandanus fibre is broken and roughened. The following list of women's dresses from Malekula, Oba and Ambrym shows the difference in size:

8143. 3.2 ft. × 10 in.—16 strands to inch. Malekula, twilled weave, no coloring;  
Fig. 56, No. 3.
8144. 3 ft. × 9 in.—15. Malekula, plain weave; Fig. 56, No. 1.
8145. 3 ft. × 11 in.—14. Malekula, twilled; Fig. 56, No. 2.



8447. 3 ft. long $\times$ 9 in. wide—20 strands to inch. Oba, with various openwork designs at ends, and stamped with magenta stain.
8448. 3.2 ft. long $\times$ 9.5 in. wide—20. Oba, like last, short fringe on edges, long on ends.
8449. 1.5 ft. long $\times$ 3 in. wide—26. Ambrym, broad red stripes, openwork ends, with long (10 in.) fringe.
8459. 3.7 ft. long $\times$ 1.7 in. wide—21. Ambrym, all red, two sewed together in the middle, ending in four braided tails and long fringes.

8144

8145

8143

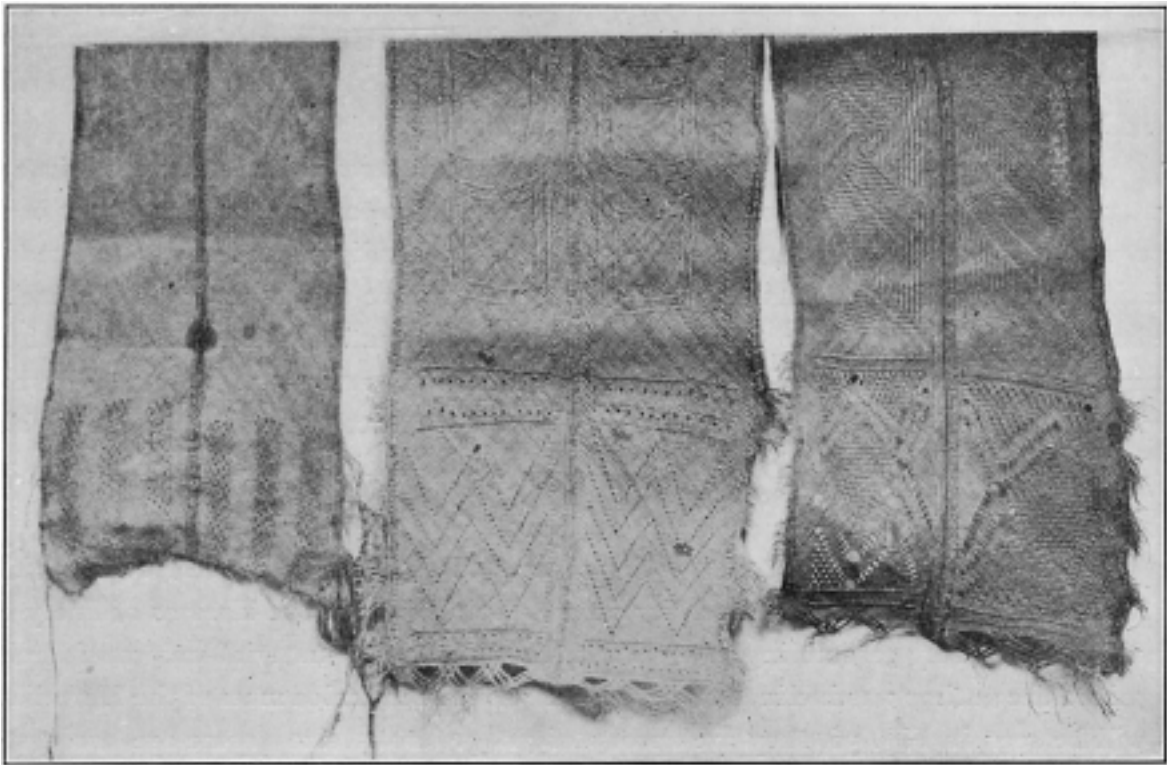


FIG. 56. WOMEN'S DRESSES FROM MALEKULA, N. H.

6627. 3.5 ft. long $\times$ 10.5 in. wide—15. Oba, openwork ends, stamped purple all over, fringes.
6628. 3.6 ft. long $\times$ 11.5 in. wide—16. Oba, same treatment as last.

**Fijian Coffin.**—This remarkable specimen of basket work is 22.5 in. long, 9 in. wide in the middle, 5.5 in. at the ends, and 9 in. deep. The bottom is wholly of breadfruit wood, and the cover is lined with the same material stitched with pandanus strands to the upper edge. The interior is lined with a plain broad weave of pandanus extending above the external rim by a foundation of two splints bound together by pandanus strips; this forms a hold for the cover. The illustration (Fig. 57) shows

what is really the distinction of the whole work, the beautiful design covering the exterior. Whether this coffin-shaped basket was really intended for the use its name would imply may be doubtful; certainly in this connection it is unimportant; the remarkably effective design of the basket work is all in all. The technic is simple, a vertical series of small black strips of uncertain origin form the more conspicuous trellis, over and under which pass portions of the close band of light brown grass-like

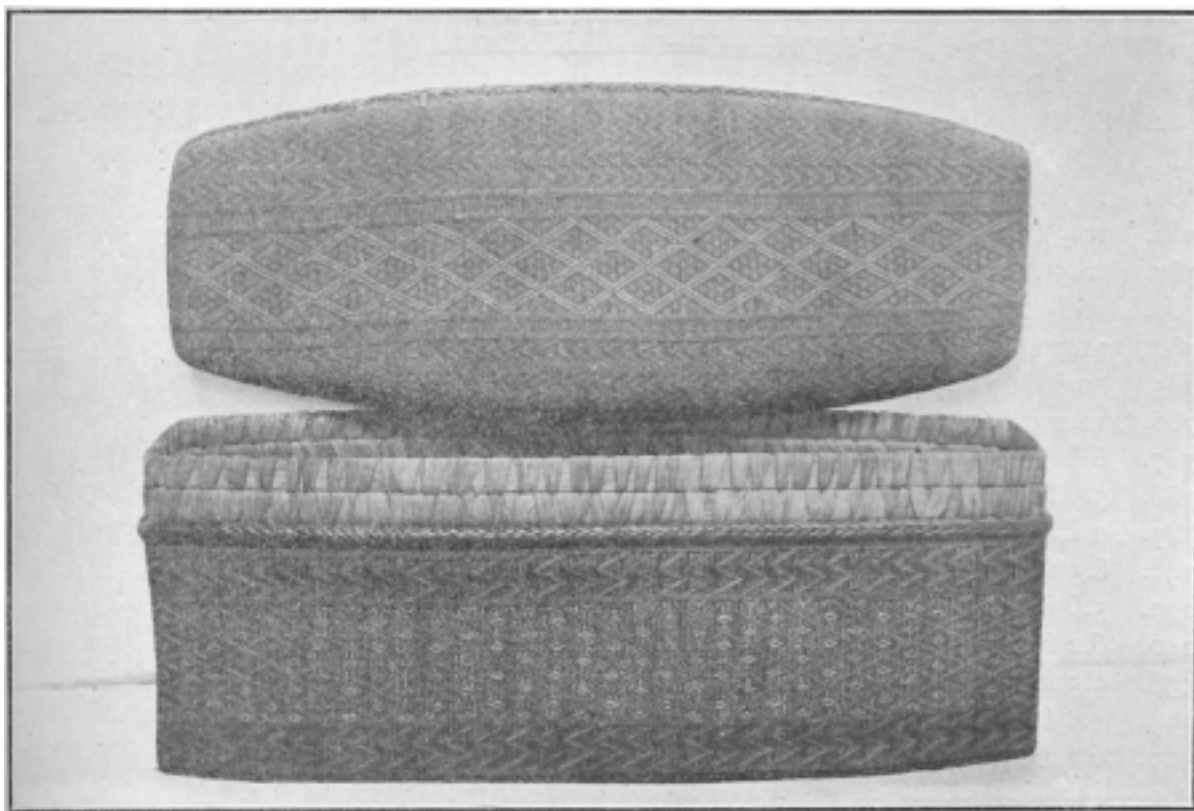


FIG. 57. FIJIAN COFFIN-SHAPED BASKET.

strips forming the design. Between two bands of zigzag is a much broader band of diaper work; the upper rim, which serves also as support for the cover, is a braid of black rattan strips. The design of the cover is not so successful. The vertical portion repeats the zigzag band of the basket proper, but the top is covered with a longitudinal band of diaper with two zigzag narrower bands on either side, with partings of subsidiary bands of a dark brown weave. Whatever the purpose of this basket we may be sure it was intended to hold something very precious, and I must doubt, in view of the light esteem in which infants were held in ancient times throughout the Pacific, that it was intended to hold the decaying remains of any baby, even the offspring of the highest chiefess.

## LIST OF PANDANUS MATS IN THE BISHOP MUSEUM.

2580. 7.2 ft.×4.7 ft.—16 strands to inch. Very fine and flat weave. Hawaiian.  
 2581. 34.3 ft.×10.5 ft. Hawaiian.  
 2582. 10 ft.×7.2 ft. Hawaiian.  
 2583. 25.7 ft.×3 ft. Dining mat. Hawaiian.  
 2586. 6 ft.×4.7 ft. With diagonal stripes. Hawaiian.  
 2591. 18.2 ft.×8 ft.—16-12 to in. Very flat weave. Hawaiian.  
 2598. 11.5 ft.×7 ft.—7-8. Hawaiian.  
 2599. 10.7 ft.×8 ft.—6. Hawaiian.  
 2602. 8.3 ft.×8 ft.—7. Hinano = young leaves, Puna. Hawaiian.  
 2603. 9 ft.×7.7 ft.—3. Hawaiian.  
 2780. 10 ft.×6.5 ft.—4. Checkered. Rotuma.  
 2781. 10.5 ft.×6.5 ft.—4. Diagonal brown stripes. Rotuma.  
 2782. 10.5 ft.×8.5 ft. Hawaiian.  
 2783. 10 ft.×9 ft.—4. Hawaiian.  
 2784. 11.3 ft.×8 ft. Old. Hawaiian.  
 2785. 10 ft.×9 ft.—7. Hawaiian.  
 2786. 12.2 ft.×7.5 ft.—6-7. Flat weave. Hawaiian.  
 2787. 6 ft.×4 ft.—5. Brown in patterns. Hawaiian.  
 2788. 5.5 ft.×4.7 ft.—5-6. Diagonal brown stripes. Hawaiian.  
 2789. 9 ft.×6.3 ft.—12. Hawaiian.  
 2791. 8.5 ft.×5 ft.—15. From Queen Emma collection. Hawaiian.  
 3239. 5.6 ft.×3.8 ft.—6. Black and white checks and twills. Niuë.  
 3240. 6.2 ft.×5.1 ft.—4.5. Black and red zigzags. Niuë.  
 3498. 9.5 ft.×5.2 ft. Leaves of two colors. Gilbert Ids.  
 3499. 4.8 ft.×4.2 ft. Gilbert Ids.  
 3500. 6 ft.×4.5 ft. Two colors with long suture. Gilbert Ids.  
 3501. 11.7 ft.×7 in.—9. Fringed belt, black stripe. Samoan Ids.  
 3505. 6 ft.×5.7 ft.—13. Fringed. Hawaiian.  
 3506. 8 ft.×5 ft. Hawaiian.  
 6310. 14.5 ft.×13.5 ft.—2. Embroidered with red. Tongareva.  
 6311. 8.3 ft.×6.5 ft. Strips of leaf sharply cut. Tahiti.  
 6629. 10 ft.×8 ft.—6. Mrs. Bishop's collection. Hawaiian.  
 6630. 6 ft.×3.6 ft.—6.—Mrs. Bishop's collection. Red border. Niuë.  
 6631. 8 ft.×7 ft.—10. Mrs. Bishop's collection. Single leaf. Hawaiian.  
 6632. 6.2 ft.×5.9 ft.—10. Mrs. Bishop's collection. Embroidered black and brown.  
 Marshall Ids.  
 6655. 5.8 ft.×4.5 ft.—16. Irregular serrate edge, fringed leaves on ends. Samoa.  
 6657. 7.4 ft.×4.6 ft.—12. Double black transverse stripes. Gilbert Ids.  
 6659. 4 ft.×2 ft.—10. Fringe on all sides, embroidered with wool. Tonga.  
 6660. 5.2 ft.×4 ft.—6. Niuë.

6661. 4.5 ft.×2.6 ft.—5 strands to inch. Fringed on surface also.  
 6662. 5.7 ft.×1.2 ft.—14. Twilled belt, open edging on ends. Santa Cruz.  
 7718. 11.5 ft.×9.5 ft. Hawaiian.  
 7755. 2.2 ft.×1.8 ft.—4. Samples made in 1834. Hawaiian.  
 7962. 13 ft.×10 ft. Hawaiian.  
 8061. 11.1 ft.×9 ft.—5. Marshall Ids.  
 8444. 6.5 ft.×2.5 ft.—9. Fringed with feathers. Tonga, N. H.  
 8445. 10.5 ft.×22 in.—9. Fringed on long edge. Tonga, N. H.  
 7729. 9.8 ft.×7.5 ft. Hawaiian.

PANDANUS MATS FROM THE MARSHALL ISLANDS.

These are all embroidered around the border with hibiscus fibre, black and red-brown; the smaller sizes are used as aprons.

3215. 2.2 ft.×2.1 ft.—11 strands to inch. With hau trimmings. Maloelab, 1839.  
 3217. 6 ft.×6 ft.—11.  
 3218. 6 ft.×5.5 ft. Narrow border.  
 3219. 6 ft.×6 ft.—11. Remarkably wide border, mostly black.  
 3220. 5.5 ft.×5.5 ft.—11. Wide border, mostly black.  
 3221. 6 ft.×5.5 ft.—11. Narrow border.  
 3222. 5 ft.×6 ft.—12.  
 3223. 6 ft.×6 ft.  
 3224. 3 ft.×3 ft.—11. Wide border, mostly red-brown.  
 3225. 3 ft.×3 ft.—9.5. Wide border. Fig. 53.  
 3226. 2.7 ft.×2.7 ft.—10. Wide border. Majuro. Fig. 53.  
 3227. 2.7 ft.×2.7 ft.—11. Narrow border not extending to the edge. Fig. 53.  
 3228. 2.7 ft.×2.6 ft.—9. Wide border.  
 3229. 2.9 ft.×2.9 ft.  
 3230. 2.7 ft.×2.7 ft.  
 3231. 2.7 ft.×2.7 ft.—10. Narrow border, mostly black. Fig. 53.  
 3232. 2.7 ft.×2.5 ft.—10. Narrow border. Fig. 53.  
 3233. 2.5 ft.×2.5 ft.—10. Narrow border.  
 3234. 2.7 ft.×2.2 ft.—11.  
 3235. 2.2 ft.×2.2 ft.—10. Fig. 53. Only one with diagonal weave.  
 3236. 2 ft.×2 ft.  
 3237. 2 ft.×2 ft.  
 3238. 5.3 ft.×5.3 ft. Medium border.  
 6656. 6 ft.×5.9 ft.—12.  
 6663. 12.7 in.×7.7 in.—12. Satchel, embroidered like the mat border.  
 6664. 11 in.×8.7 in.—12. Satchel, embroidered like the mat border.  
 7563. 3 ft.×3 ft.—9. Mat with wide border.

**Baskets of Ieie.**—We are now to consider one of the two most distinctive Hawaiian works in basketry, and one which, for solidity and durability of workmanship, I believe to be unsurpassed in this Pacific region, nor do my limited studies in the field of basketry embrace any baskets of any region which may justly be accorded a higher rank than pertains to the baskets made from ieie by the Hawaiians. Unlike



FIG. 58. FREYCINETIA LEAVES.

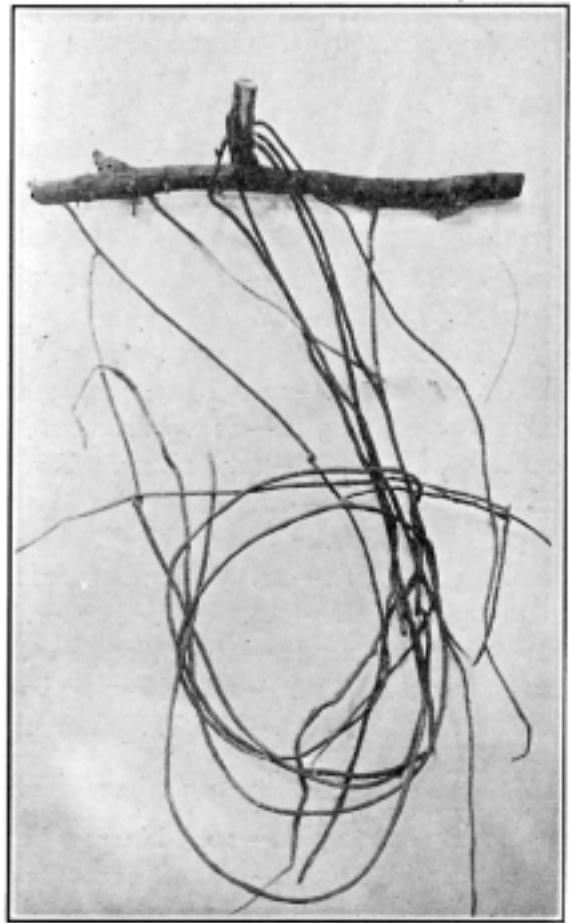


FIG. 59. FREYCINETIA ROOTLETS.

the pandanus, its near relative, the Freycinetia does not offer in its leaves its most useful product, although these are similar in shape but smaller in size than those of the pandanus. It is a slim, scandent plant, either making dense jungle with its partly recumbent stems, or climbing high among the trees where its tufts of green leaves enclosing in the flowering season the bright red flowering leaflets, among which the three flower heads rise, always attract the eye of an observant traveler. From the slender stems perpend long rootlets of almost uniform diameter which cling to the

trees or swing freely in the air. Fig. 59. Slight and flimsy as these rootlets appear they are the all-important product of the plant.

Hanau ka ieie hihi i ka nahele.  
Born is the tangled ieie in the forest.

is a common saying of the old Hawaiians, for the plant is found in abundance in the forests, especially the more elevated ones, all over the group. It is also found on other

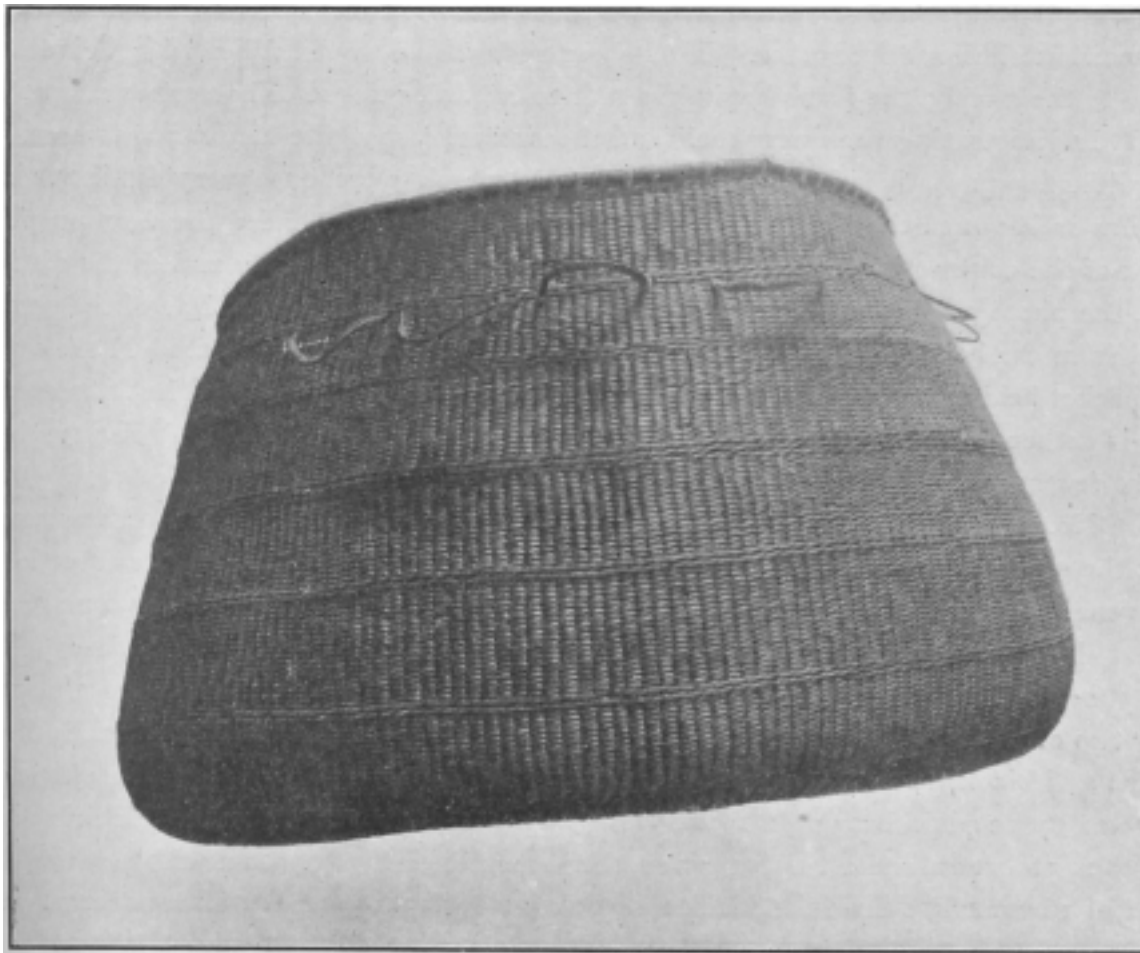


FIG. 60. BASKET OF IEIE. SEE PLATE VII FOR COVER.

Pacific islands, the name ie, or ieie, extending through Polynesia. The Maori ikiike, or kiekie (*Freycinetia banksii*) is the same word.

In the days of idol worship the ieie was used for decorating the idols, and at the present day the word is applied to a person decorated with lei or wreaths. For general rustic decoration it is also very fit, as it does not soon fade nor drop its leaves. Ornamental it will always be, but its usefulness seems to have departed from these Hawaiian Islands, for no longer are the baskets made that attracted, alone among the

basketry of the Pacific, the wonder of early visitors. There may still be a very few specimens stored in the closets of some old residents, but I know of none in any museum except the two complete with one coverless specimen in this Museum, and I shall therefore both describe and figure these most carefully.

There is little to say about the preparation of the rootlets: they were sometimes split in halves and sometimes used whole. The structure is rather peculiar and serves to distinguish this material from the many vines of the *Convolvulus* family that have a somewhat similar appearance. In the centre are five or six tubes which give elasticity to the strips; the ferns having in section a harder tissue of horseshoe shape.

In illustrating the finest basket of this material that the Museum possesses we find difficulty in distinguishing the two colors which were once very distinct, since age has so browned the light color of the natural stem, and so faded the deep purplish black of the contrasting portion, that while the eye with difficulty makes the distinction, the photographic plate has failed to do so, except in the middle of the second band from the bottom. Fig. 60 shows the body of the basket, and Plate VII the cover, the basket belonging to what we may for convenience call Class I. The full description is rather dull reading to any but an expert in basketry, but is worth giving, there are so few specimens left, and time must destroy these.

No. 7651. Diameter 26 in., height 17 in. Specimen in good condition, except that the cover is cracked all along the upper rim, and several of the side cover loops are gone. Starting from the rim, which is of course reversing the order of manufacture, this rim is flat, consisting of two rods carefully clothed with flat strip, every fifth and sixth one going down under two horizontal twisted rounds in which the strips pass over two of the upright strips. Then a band of dark and light strips, originally light brown and black, 16 rounds of two-ply over uprights of 3 rods each; 2 rounds twisted, followed by 12 plain brown; 2 twist, variegated band of 17 rounds; 2 black twists and 1 brown, 16 brown and 2 twists; sides then turn in to form bottom with a variegated band of 16 rounds, 1 brown, 1 black and 1 brown twist; 11 variegated rounds, 7 brown rounds, 3 brown twists; 15 brown rounds, 2 twists; 10 brown rounds followed by 7 twists to centre of start. There are 19 braided sennit loops to attach cover. Cover is formed with the same kind of rim, 2 twists, 2 black, 7 brown rounds, 1 twist; 19 variegated, 2 twist, turning edge; 18 brown rounds, 2 twist; 25 variegated rounds, 12 twists; 8 brown and 2 black twists; 12 twists to centre. This basket, supposed to have come from the island of Hawaii, was many years in the cabinet of the A. B. C. F. Missions in Boston.

No. 6589. This basket is plain brown without color decoration, 17 in. in diameter and 10 in. high. The rim is similar to the last, but has three bars as a foundation instead of two. The succession from the rim is as follows: 2 twists, 10 rounds;