A Revised System for the Classification and Coding of Hawaiian Fishhooks

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ABSTRACT

Studies of fishhooks have indicated that fishhook typology, manufacturing methods, and materials are characteristic in time and space within an island group and between island groups (Sinoto 1967). This paper describes the 3 major Hawaiian fishhook groups: 1-piece, 2-piece, and composite hooks. The bibliography includes publications and manuscripts based on fishhooks recovered from excavations in Hawai'i and other parts of Polynesia.

INTRODUCTION

Since the original fishhook classification and coding system was published in 1959 (Emory, Bonk & Sinoto) and the Hawaiian 1-piece hook head typology was published in 1962 (Sinoto), a number of additional fishhooks have been excavated and studied. Furthermore, archaeologists have made significant fishhook collections and studies outside of Hawai'i in Polynesia. Also both the Hawaiian fishhook and head type classifications and coding systems have been revised time to time (Sinoto & Sohren 1966; Sinoto 1976; Sohren 1966). The system has been in use for a long time as a manual for Hawaiian fishhook studies.

This paper is the 1976 version of the system with minor modifications. It is presented here as a manual. Researchers may easily adopt the coding system into computer programs to fit specific research needs. For an example of such a work, refer to Akira Goto's Ph.D. dissertation (1986).

ONE-PIECE HOOKS

In archaeological classification there are always objects that are difficult to classify into one type or another; fishhooks are no exception.

One-piece hooks are made from a single piece of material. The jabbing and rotating 1-piece hooks (Figs. 1, 2, 14) mechanically differ in the hook action when pulled by fish or fisherman. In most cases there are morphological differences in fish as well. Terminology of fishhooks and the features are indicated in the figures throughout the text.

Jabbing Hook

The main axis of the shank and point of a jabbing hook is parallel (Figs. 1A; 3A, C; 14A, B), the point is slightly incurved (Fig. 1B), or the point axis slants away from the shank (Fig.1C). Usually there is a wide gap between the shank and point. When a fish bites, the fisherman must pull the line quickly to avoid losing the fish.

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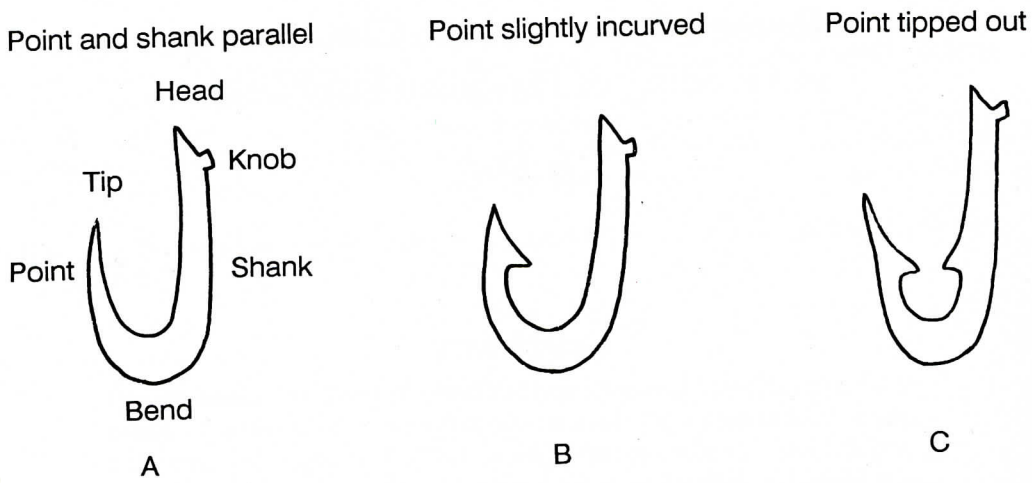

Fig. 1. Hawaiian 1-piece jabbing fishhooks.

Rotating Hook

Either the shank or point of a rotating hook (Figs. 2; 3B, D, E; 14C–H) is curved or angled inward (toward the other piece). If the visual classification is difficult, extend the curvature of the outer edge of the point. If the line intersects the shank, classify it as a rotating hook (Fig. 3D, E). Originally (Emory et al. 1959) such an arbitrary division was made that when the extension of the curvature of the outer edge of the point intersects lower than ⅔ of the shank height, it was classified as a rotating hook. In practice this was awkward to do and the method was simplified.

This kind of arbitrary division may cause some overlapping in classifications. A similar result can be seen between large and small slender type 2-piece hook points (Emory et al. 1959, Fig. 9).

TWO-PIECE HOOKS

Two-piece hooks are made of 2 separate pieces of material, shank and point, and lashed together at their bases. There are 3 basic types of 2-piece hooks in Hawai'i: slender type, massive type, and shark-hook type (Figs. 4–6, 15A–D, I, J).

Slender Type

The shank length is more than twice as long to several times longer than the point (Figs. 4A, B; 15A–C), leading to the type designation. Points are usually made from thin bones and occasionally pearl shell. More points than shanks have been found, implying that the shanks are made mainly of wood. Few archaeological specimens are made of pig or dog rib bones without much modification except for the lashing device at the base and the head (Figs. 4A, B; 15B–C). There are no specimens of this type in the ethnological collections in the Bishop Museum. But the 1 in the Musée de l'homme, Paris, and the Vancouver collection currently housed at the British Museum was most likely collected from Hawai'i (Sinoto 1959), even though Beasley (1928, pl. LXII) identified the latter's locality as Tahiti.

One of the most significant results of Hawaiian fishhook studies is the typological and chronological development of 2-piece hook point and shank base features for lashing. It has proven necessary to create subgroups of the notched and knobbed bases except for those classified as shark-hook point-tips and crescent points.

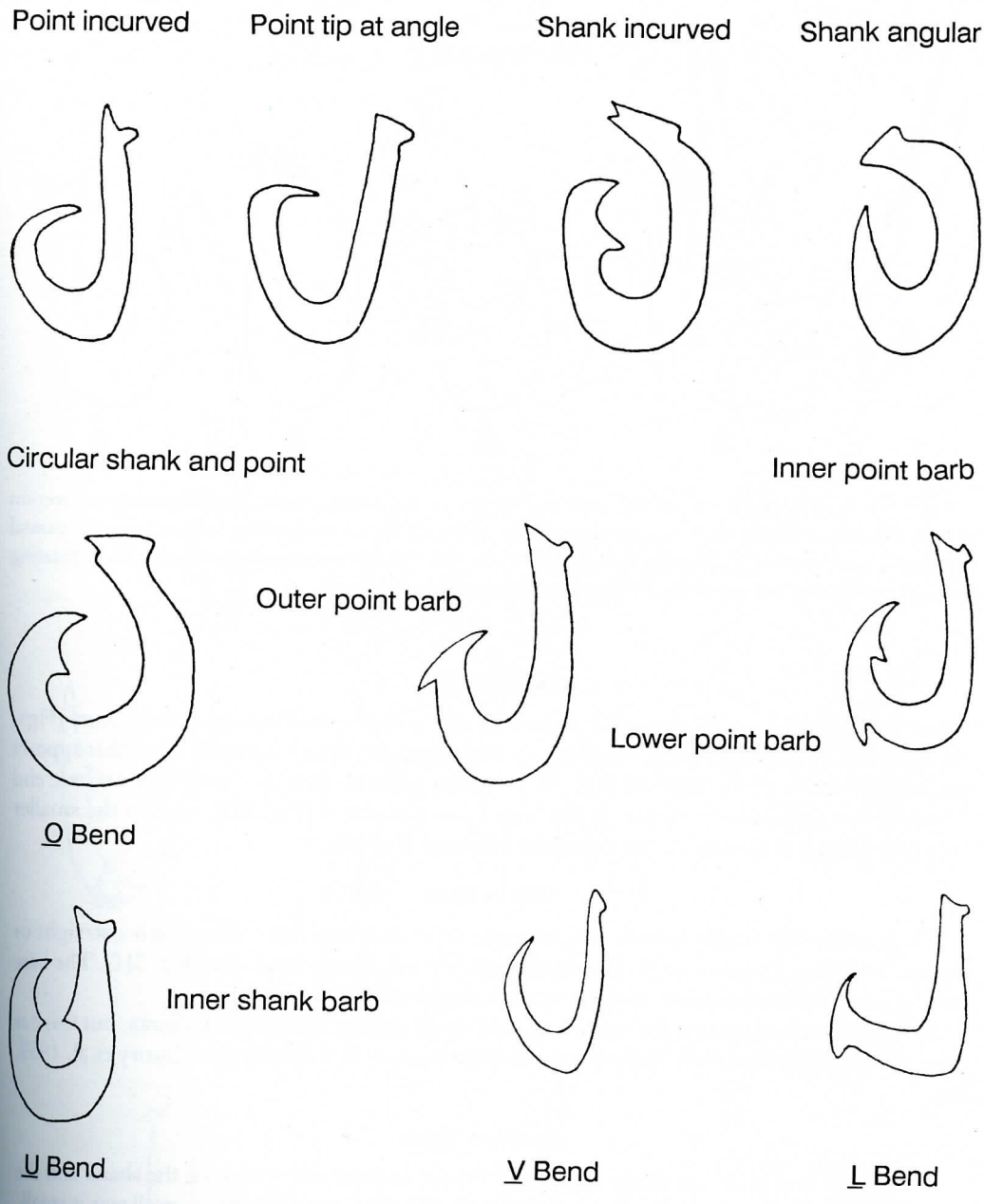

Fig. 2. Hawaiian 1-piece rotating fishhooks. Bend forms apply for both 1-piece hooks.

Notched Base

The line along the outer edge of the point or shank is not interrupted to the base end. One or more sharp horizontal grooves cut on the outer face of the point or shank toward their base (Figs. 4A, C, D; 5A; 15C).

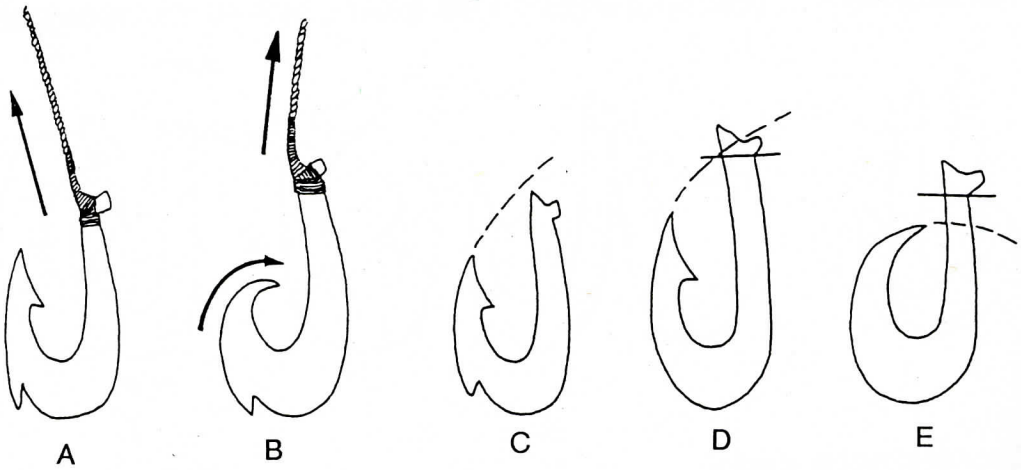

Fig. 3. Forms and actions of jabbing and rotating hooks: **A,** jabbing hook, showing straight direction of pull; **B,** rotating hook, showing rotating motion with pull; the rotating action is lateral, not horizontal spinning; **C,** jabbing hook, showing that extended point curve line does not intersect shank; **D,E,** rotating hook, showing that extended point curve line does intersect the shank.

Knobbed Base

The line along the outer edge of the point or shank is interrupted by a knobbed feature (Figs. 4B, E, F; 5B; 15A, B). There are 3 types of knobbed features: (1) pronounced knob that appears rectangular (side view) at the base (Fig. 5C); (2) triangular knob (side view) with flat base end (a higher triangular knob appears on the larger point or shank [Fig. 5D] than on the smaller ones [Fig 5E]); and (3) knob with triangular base end (Fig 5F).

Plain Base

It is possible that hooks in this category are unfinished, especially those with a straight or curved base (Fig. 5G). The angled base looks like a knob distally extended (Fig. 5H). The base may become a classifying feature with more archaeological samples.

The earlier coding system separated large and small slender 2-piece hook points, but this has been eliminated because it is difficult to define the broader line exactly (see Emory et al. 1959, Fig. 9).

Massive Type

Both shank and point are made from thick bones, and the ratio between the shank and the point is similar to that of 1-piece hooks (Figs. 4G; 15I, J). Even when the overall size is small, thickness gives a massive impression.

Shark-Hook Type

The shank and point-limb are made of wood with a bone point-tip (Fig. 6). The type name is based on the similarity of its shape to that of examples of ethnological shark hooks, but these hooks are not necessarily used only for shark fishing—the smaller hooks could be used for fish such as tuna (*ahi*) or yellow Jack (*ulua*). Only points have been excavated, except for very rare findings of wooden shanks from dry caves.

Bone point-tips for shark-hook type hooks are called crescent points as their profiles indicate.

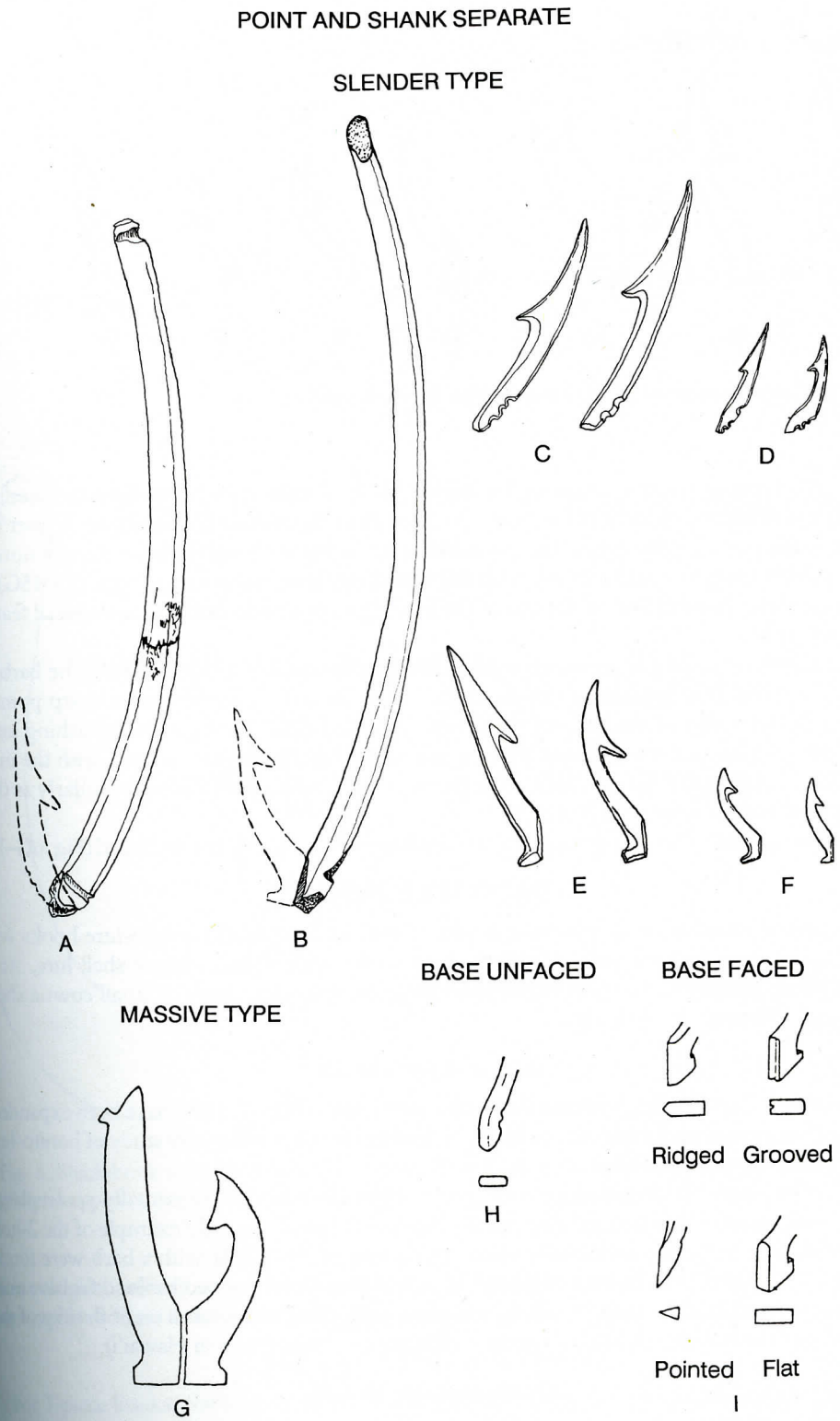

Fig. 4. Hawaiian 2-piece fishhooks: **A–F,** slender type; **G,** massive type; **H,** base unfaced; **I,** base faced.

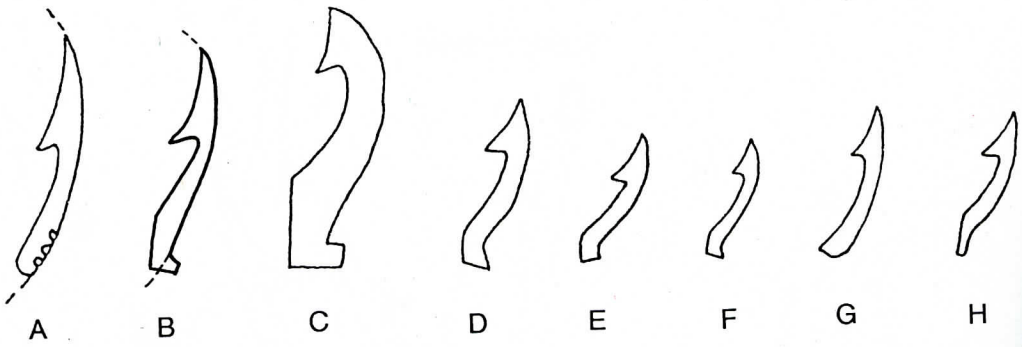

Fig. 5. Outer base features of Hawaiian 2-piece fishhook points.

There are 2 types of points, slender and massive. All the slender type points have an inner barb and 4 types of lashing devices at the base. High notches (Figs. 6B; 15E), similar to slender type 2-piece hook point base notches, are cut halfway up or higher from the base. Lower notches (Figs. 6C; 15F) appear usually about ⅓ up from the base. Base end notches (Figs. 6D; 15G) are cut on the lower portion and on the end of the base. Plain points do not have any special feature (Figs. 6E; 15H).

The massive type points are much thicker and larger than the slender points. The barblike feature (Fig. 6G–I) is apparently not the barb, but it has a flat base without a sharp point to secure it in the socket of the limb of the shank. So-called shark hooks with the lashing intact in the ethnological collections show that the top of the barblike feature is flush with the inner face of the shank limb (Figs. 6F; 15D). The barbs of the crescent points served similarly as they are flat with rounded tip ends (Fig. 6A).

There are 3 types of lashing devices at the outer base: plain, ridged, and knobbed (Fig. 6G–I).

COMPOSITE HOOKS

Composite hooks are multiple-piece hooks. There are 2 types: (1) bonito-lure hooks with shank, point, and hackles and (2) octopus-lure hooks with shank, cowrie-shell lure, stone sinker, point, hackle, and toggle. Sometimes there are secondary lures of small cowrie shells tied under the main cowrie shell.

Bonito-Lure Hooks

Classification and coding systems for bonito-lure hooks (Figs. 7; 15N) have been expanded, making the systems useful not only in Hawai'i, but also in the comparative study of bonito-lure hooks found outside of Hawai'i.

In East Polynesia the bonito-lure hook point with base extended proximally was replaced by the hook point with base extended distally. So far in Hawai'i the only example of the 2-hole point with base extended proximally and 2 specimens of the 1-hole with a barb were found from the Pu'u Ali'i Sand dune site, Hawai'i Island. Points with knobbed bases so far have only been found from Lāna'i Island. Securing the point well, there are notches on both sides of the distal end of the lure shank (such a specimen has not yet been found in Hawai'i).

Octopus-Lure Hooks

Classification and coding systems for octopus-lure hooks (Figs. 8, 9, 15O) have also been expanded to include stone sinkers (Fig. 8). Coffee-bean type sinkers have been found in the

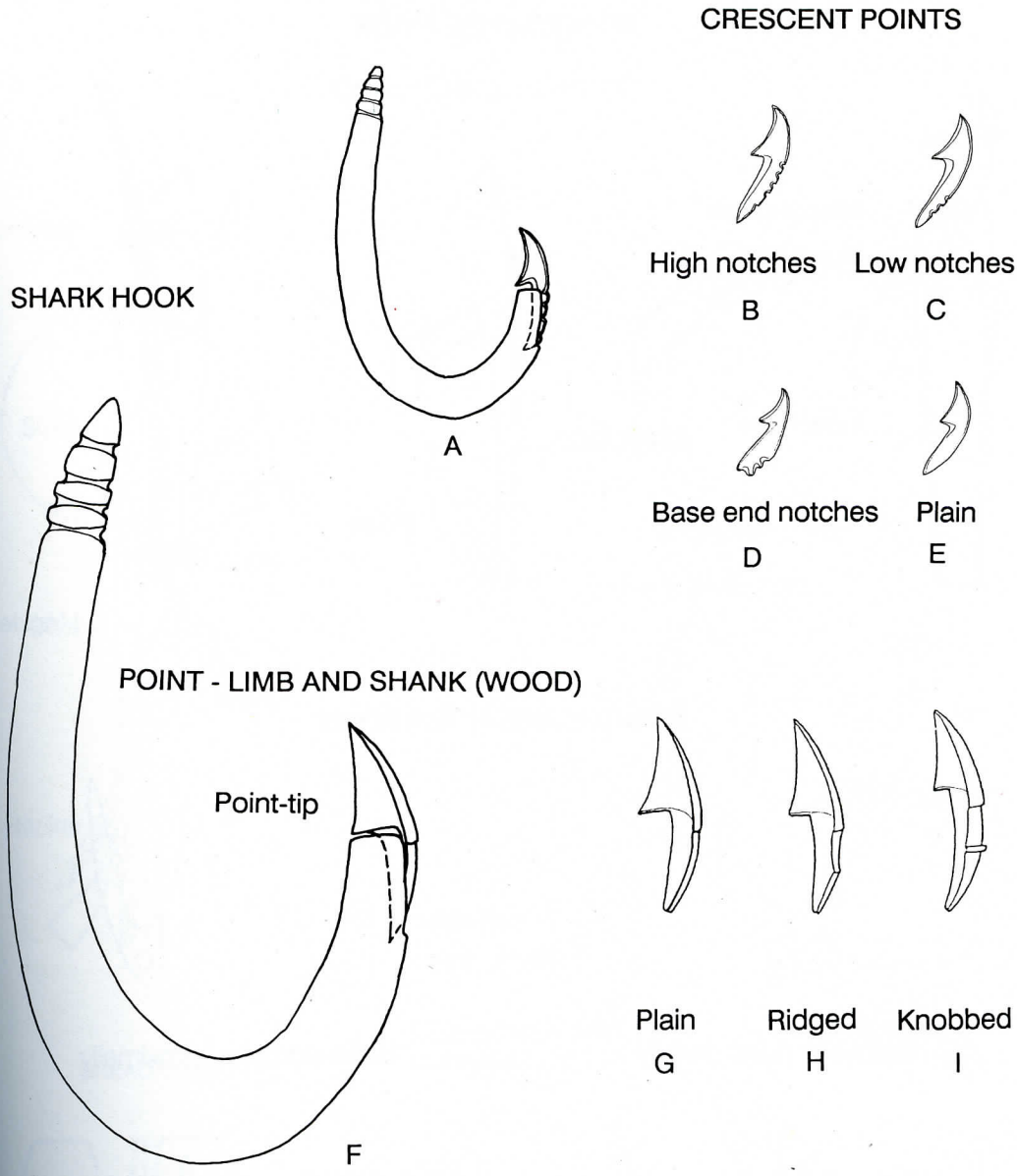

Fig. 6. Shark-hook type hooks: **A–E,** smaller shark-hook type with crescent points; **F–I,** larger shark-hook type with massive points.

archaeological collections in the Society and the Marquesas islands, but no toggles have yet been reported from these areas.

MEASURING METHOD

For 1-piece hooks, the lengths of the shank (SL) and point (PL) are taken at right angles to the base; the width (W) is taken from the outer edge of the shank to the outer edge of the point, parallel to the base (Fig. 10A) at the widest point of the hook.

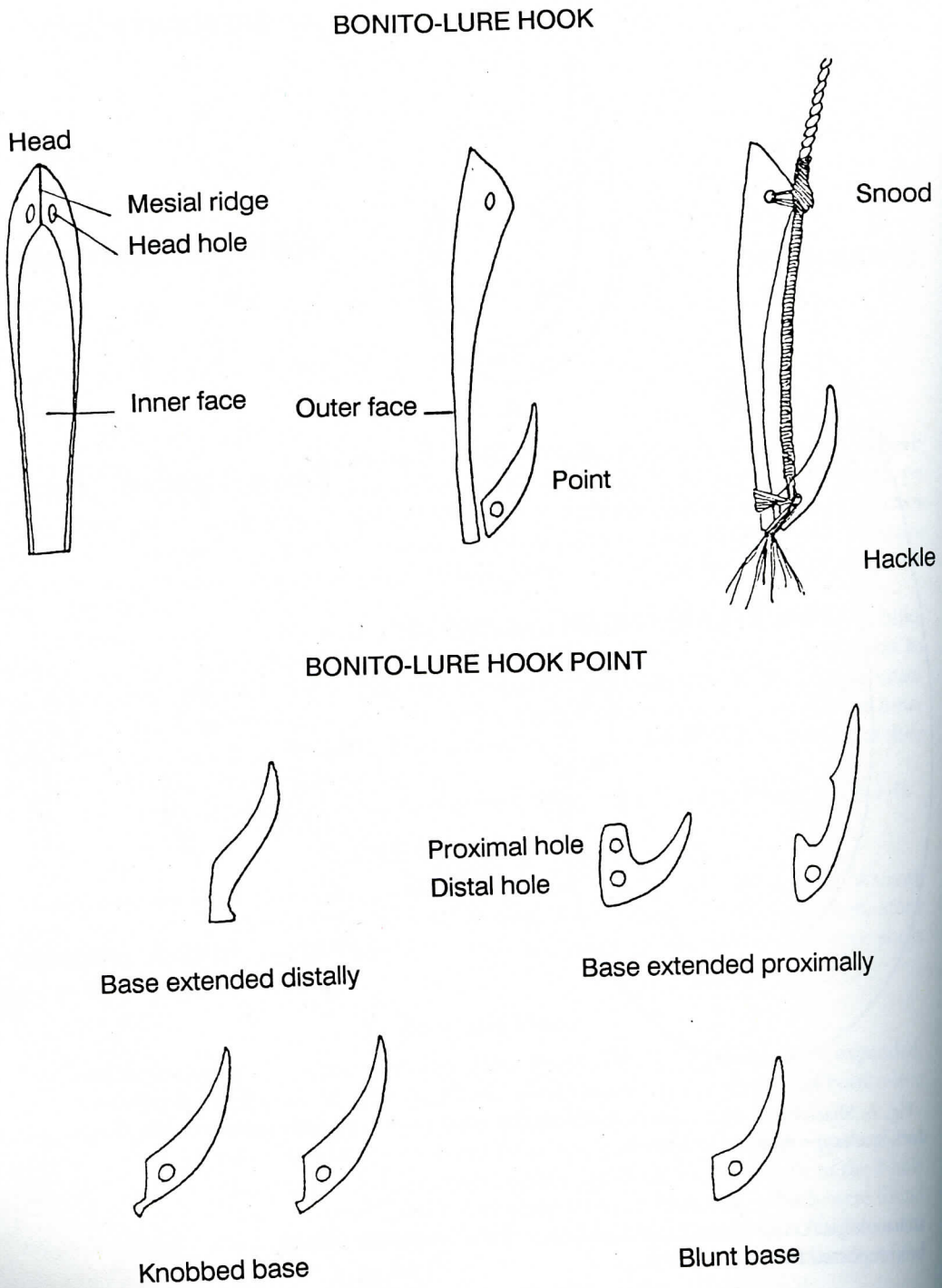

Fig. 7. Hawaiian bonito-lure hooks.

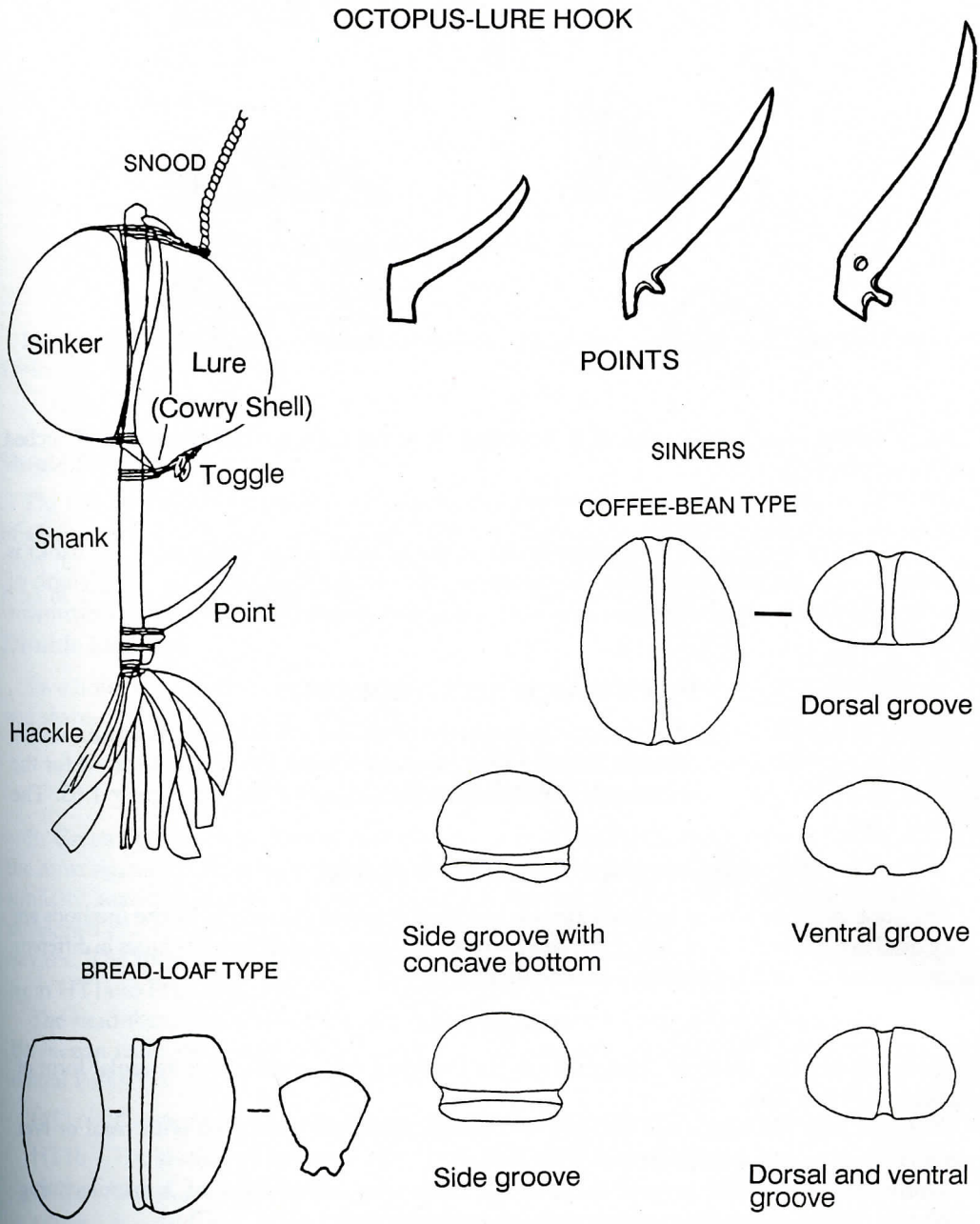

Fig. 8. Hawaiian octopus-lure hooks and sinkers.

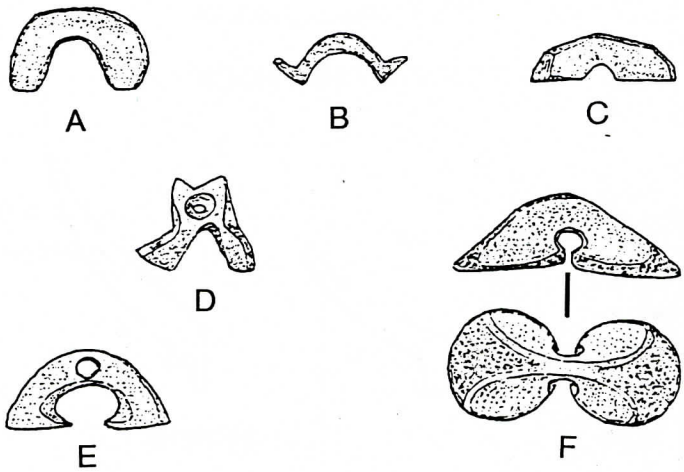

Fig. 9. Octopus-lure hook toggles: **A,B,** U-shaped (Type A); **C,D,** notched (Type B); **E,F,** arched and footed (Type C).

The length of 2-piece and composite hooks with flat inner edges (juncture with shank) is measured with that edge parallel to the measuring instrument (Figs. 10B, C). The length of all other types is measured with the outer curve of the point tangent to the measuring instrument (Fig. 10D).

POINT AND SHANK RATIO

Statistical analysis shows that the ratio between the point and shank lengths is significant for differentiating fishhook collections between island groups (Sinoto 1967). The formula for the ratio is Shank Length : Point Length. For example, SL 19.8 mm : PL 12.0 mm = 1.65. The ratio is 1.65.

MANUFACTURE OF FISHHOOKS

Fishhook manufacturing methods are also showing regional characters. Some methods are only used in a particular area, but at the same time similar manufacturing techniques in different areas indicate closer relationships between them.

Preparation

Roughed-out tab: Bone or pearl shell tab was roughed out, usually in rectangular form of various sizes (Fig 11A, 14I).

Prepared tab: The edges and surfaces of a roughed-out tab were filed with coral or lava abraders to the general shape desired (Fig. 11B).

Unfinished hook: The general shape of the hook was refined by 1 of 3 manufacturing methods: filing and notching, simple drilling, or double drilling (Fig. 11C).

Manufacturing Methods

Filing and Notching

A deep notch was cut straight or diagonally into the prepared tab from the top edge. Then the notch was enlarged to form the point and the shank. This method was used to make jabbing hooks (Fig. 12A).

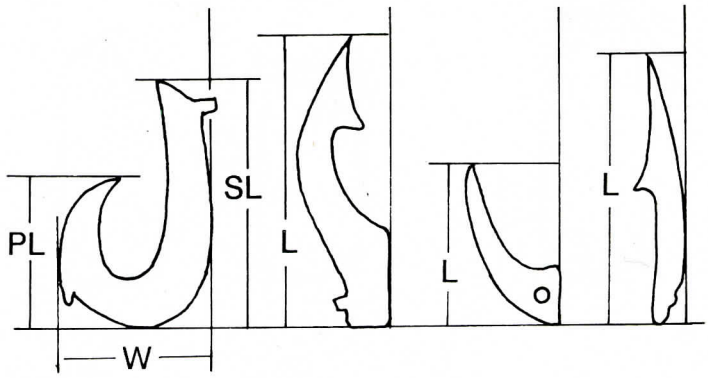

Fig. 10. Measuring method of Hawaiian fishhooks. PL=point length, SL=shank length, W=width, L=length.

Single Drilling

The outside edge of a prepared tab of bone or pearl shell was filed to form the rough outline of a hook. A hole was then drilled (Figs. 12B, 14J) in the center of the tab and a notch was filed from the outside edge at the upper corner (Figs. 12B; 14K–M), separating the point from the head of the shank. This method was used to make rotating hooks.

Double Drilling

Two holes were drilled in the prepared tab to make either jabbing or rotating types of inner- and shank-barbed hooks (Fig. 12C, D).

HAWAIIAN FISHHOOK HEAD (LINE-LASHING DEVICE) TYPES

R. Green's (1960) classification of the head forms of his Mangarevan 1-piece hooks, one of the most significant studies, demonstrated that the head forms changed through time. Sinoto similarly analyzed Hawaiian 1-piece hooks and learned that the changes in the head forms developed chronologically, just as those of 2-piece hooks, especially their point-base lashing devices. The most characteristic typological change of Hawaiian 1-piece hook head types is from HT1a to HT4 (Fig. 13).

The head-form sequence of 1-piece fishhooks has great merit for comparative studies of Polynesian fishhooks, since no 2-piece hooks (slender and massive) have yet been found in central Polynesia.

HT1a The shank end is flat with a notch on the outer side just below the top.

HT1b The shank end has notches on both sides just below the top.

HT1c The shank end has notches on the top.

HT1d Essentially the same as HT1a, except that the top of the shank is sloped markedly upward from outer to inner edge, and the outside notch may produce a projection resembling the knob of HT4a. However, this "knob" does not protrude beyond the outer edge of the shank as it does in HT4a.

HT2a The shank head is pointed with a notch or notches on the outer side just below the top. The head may be straight or incurved.

HT2b The shank head is pointed with notches on both inner and outer sides.

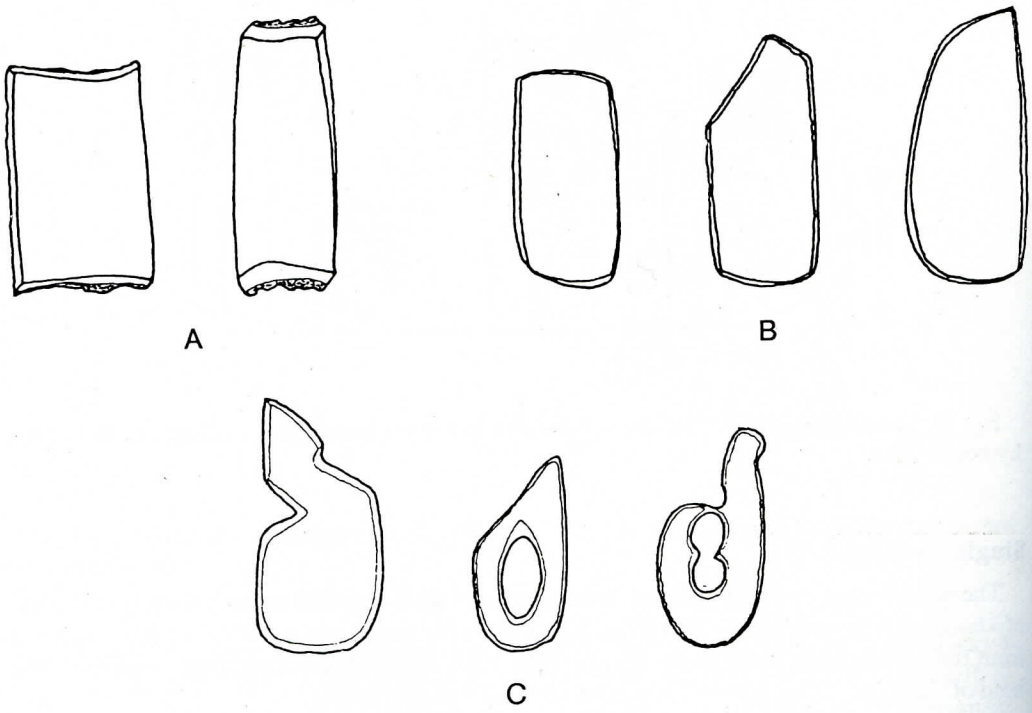

Fig. 11. Initial preparation of fishhooks: **A,** roughed-out tabs; **B,** prepared tabs; **C,** unfinished hooks.

HT3a The protruding shank end has notches on both inner and outer sides and the top may be flat or indented.

HT3b The shank top is curved toward the point or straight and has a groove or grooves around it instead of notches.

HT3c The shank head has a wide top that projects inward but has a distinctly protruding knob made by notching the outer edge of the shank just below the top and the upper surface of the shank end. The knob, however, does not protrude beyond the outer edge of the shank.

HT4a The shank end has an angled profile with the upper surface protruding distinctly beyond the outer edge of the shank. It is nearly straight or only slightly concave, but not deeply notched.

HT4b Similar to HT4a but with a definite notch on the top and outer edge protruding a distinct knob. The knob may be at right angle to the axis of the shank, at right angle to the slope of the shank end, or at any point between.

CODING SYSTEM OF HAWAIIAN FISHHOOKS

(Revised 1976)

For application of the coding system, refer to the examples of the illustrated hooks. Two-piece hooks are coded by shank and point separately, but the complete hook such as in ethnological collections may be coded together with a slash.

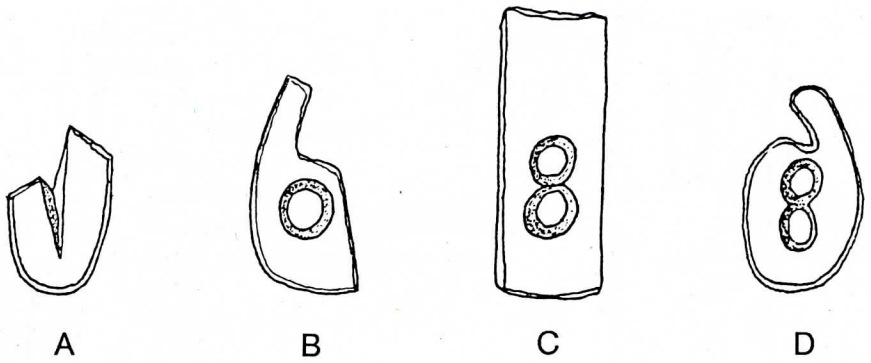

Fig. 12. Manufacturing methods: **A,** filing and notching; **B,** single drilling; **C,D,** double drilling.

I One-piece hooks
- A Jabbing
  - 1 Point and shank parallel
  - 2 Point slightly incurved
  - 3 Point tipped out
- B Rotating
  - 1 Point tip at angle
  - 2 Point incurved
  - 3 Shank angular or incurved (point straight)
    - *A* Angular
    - *B* Incurved
  - 4 Circular shank and point

Bend characteristics of 1-piece hooks:
- *U* U-shaped
- *V* V-shaped
- *O* Circular
- *L* Shank straight, point-limb curved

II Two-piece hooks
- A Crescent points
  - 1 Point tip
    - *A* High notches on base extending over ca. ½ of point length
    - *B* Low notches on base extending ⅓ of point length
    - *C* Base end notches
    - *D* Knobbed
    - *E* Ridged
    - *F* Plain
  - 2 Point limb, bend, and shank
- B Point and shank separate
  - 1 Point straight or slightly incurved (slender)
  - 2 Point incurved (massive)
  - 3 Shank (slender) straight or curved
  - 4 Shank (massive) straight or curved

Base characteristics of 2-piece shanks and points:

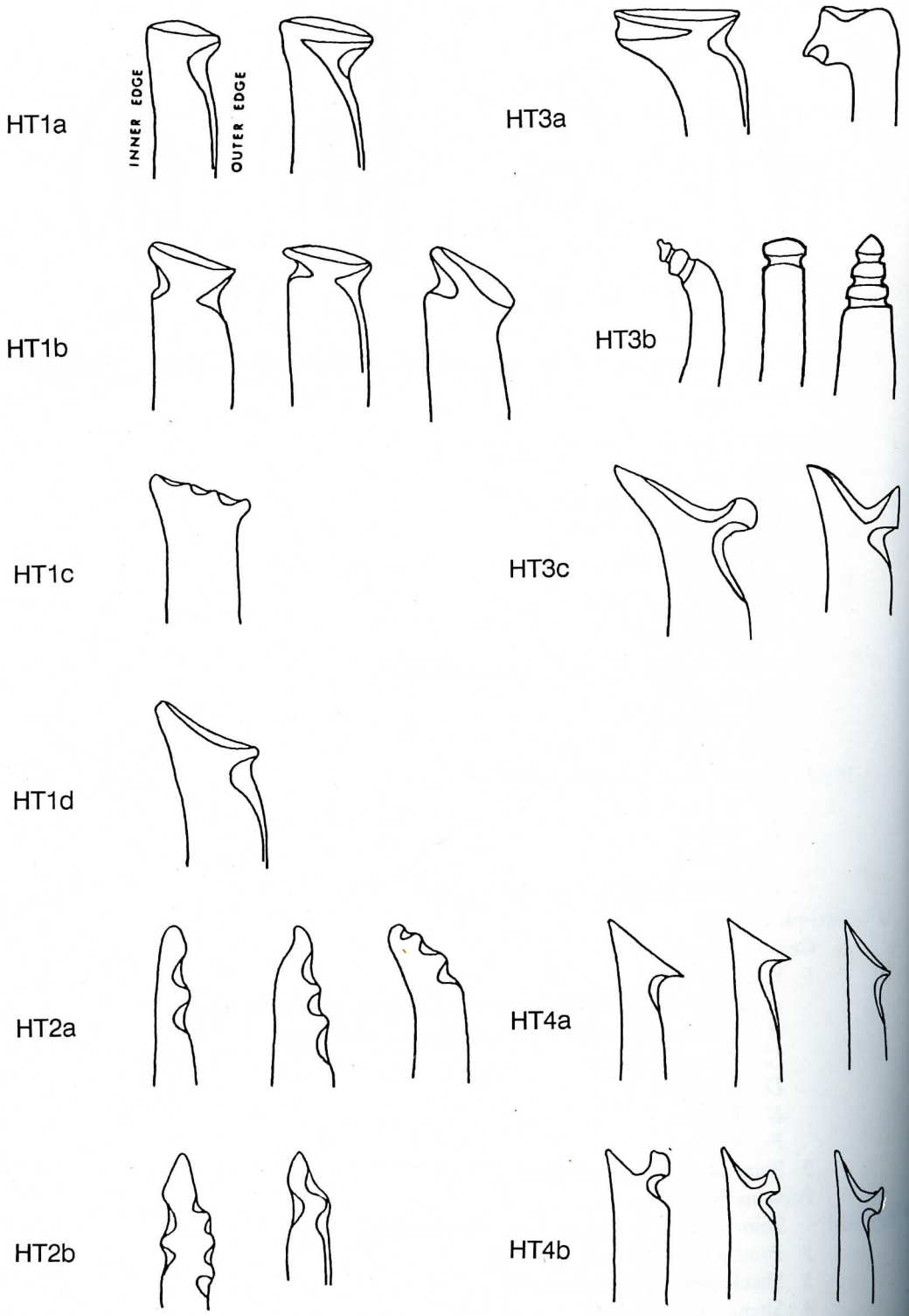

Fig. 13. Hawaiian fishhook head types.

Outer bases
A Notched
1 One notch
2 Two or more notches
B Knobbed
1 Pronounced knob
2 Triangular knob with flat base end
3 Knob with triangular base end
C Plain
1 Straight or curved
2 Angled
Inner bases
a Inner edge of base unfaced
b Inner edge of base faced
1 Flat
2 Grooved or ridged
3 Ridged and pointed
c End of base notched

III Composite hooks
A Bonito lure
1 Point perforated, 1 hole
A Base extended proximally
B Base extended distally
C Blunt base
D Knobbed base type (Lāna'i)
2 Point perforated, 2 holes
A Base extended proximally
B Base extended distally
3 Shank, head perforated
A Base notched
B Base plain
4 Shank, head unperforated
A Base notched
B Base plain
B Octopus lure
1 Point
2 Shank
Base characteristics same as for 2-piece hooks
3 Sinker
A Coffee-bean type
B Breadloaf type
C Other
1 Dorsal groove
2 Ventral groove
3 Dorsal and ventral grooves
4 Dorsal groove with concave bottom
5 Groove on sides
4 Cowrie lure
1 Primary
2 Secondary

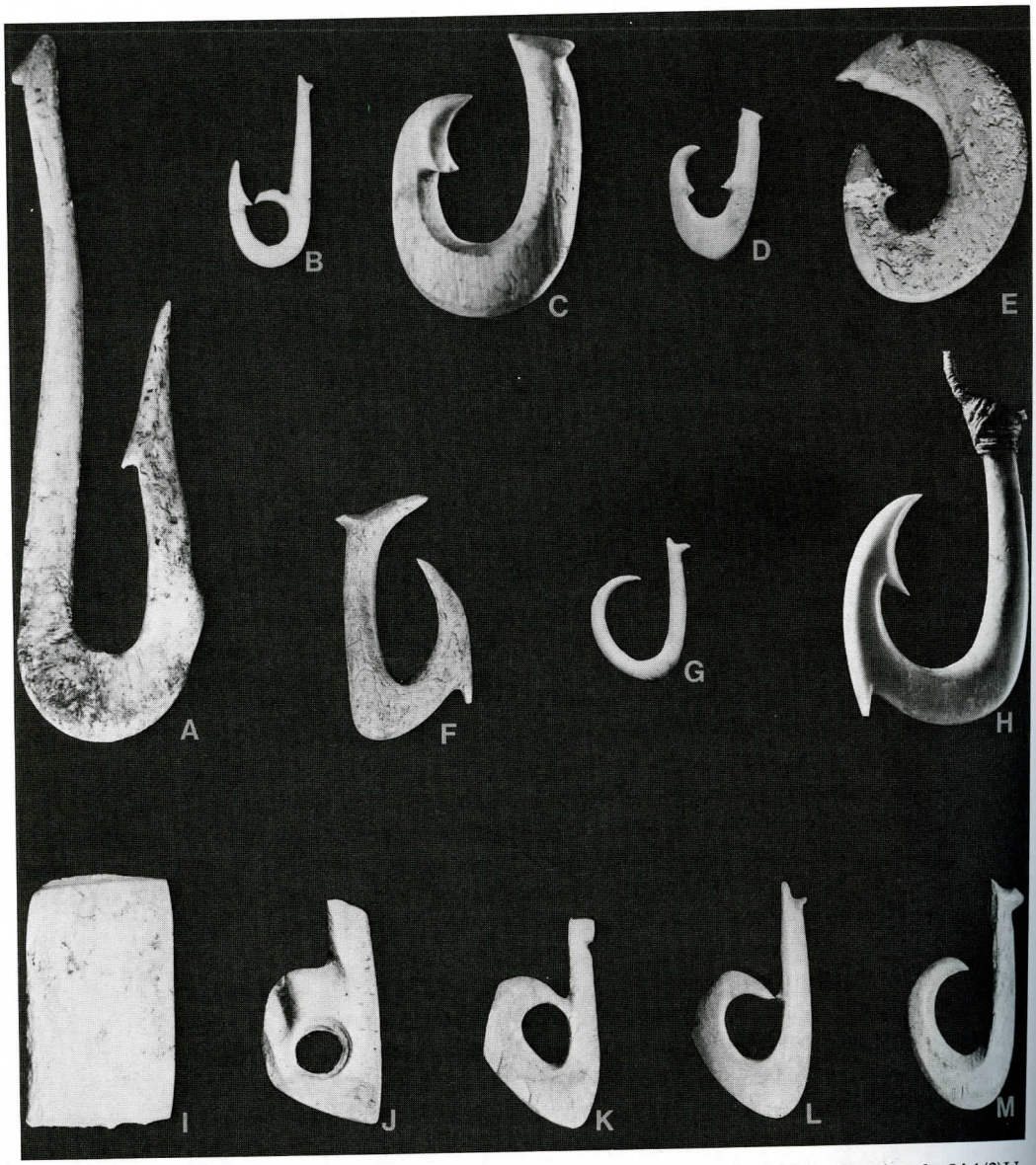

Fig. 14. One-piece hooks and manufacturing steps of a rotating hook. Jabbing hooks: **A,** IA1(2)U HT4b a; **B,** IA2(2,5)U HT4b a. Rotating hooks; **C,** IB2(2)U HT1a a; **D,** IB1(2,5)U HT1b a; **E,** IB3B(2)U HT3a a; **F,** IB2(4)L HT3c a; **G,** IB2(1)U HT4b a; **H,** IB2(2,4)U HT4b a; **I,** Rough-out tab, bone; **J–M,** stages from single-drilled tab to finish as a rotating hook, IB2(1)U HT4b a. Actual size.

5 Toggle
- *A* Type A, U-shaped
- *B* Type B, Notched
- *C* Type C, Arched and footed

Barb types (applies to all hooks)
- (1) No barb
- (2) Inner point barb
- (3) Outer point barb
- (4) Lower barb
- (5) Inner shank barb

Fragments (applies to all hooks): prefix S- to hook code
- (a) Head
- (b) Shank
- (c) Bend
- (d) Point
- (e) Base (2-piece or composite)
- (f) Cut off
- (x) Unfinished
- (z) Too small to classify

Materials (applies to all hooks)

a	mammal bone	g	bird bone
b	pearl shell	h	fish bone
c	turtle shell	i	mammal tooth
d	metal	j	cowrie shell
e	ivory (whale)	k	stone
f	wood		

Examples of Coding System

1. A hook in 14A. IA1(2)U HT4b a. One-piece jabbing hook with a point barb, U-shaped bend, knobbed shank head, made of mammal bone.
   If the shank head is missing, then coding is S-IA1(2)U a (b.c.d).
2. A hook in 14F. IB2(4)L HT3c a. One-piece rotating hook with a lower barb, L-shaped bend, protruding inward shank head with knob, made of mammal bone.
   If the upper portion of the shank is missing and it cannot be determined whether jabbing or rotating, then coding is S-IA/B(4)L a (c.d).
3. A hook in 15C. IIB1(2)A2b4 a/IIB3(1)A1b3 HT3b a. Two-piece hook point with an inner point barb, outer base notched more than twice. Inner face ridged and pointed/2-piece hook shank outer base notched once, inner face grooved, grooved shank head type, made of mammal rib bone.
4. A hook in 15D. IIA1(1)E a/IIA2(1) HT3b a. Sharkhook type 2-piece hook point with a ridge, made of mammal bone/point-limb, bend and shank-limb, made of wood.

For additional coding examples, see captions of Figures 14 and 15.

In order to have complete information on a hook the following data should be included: (1) site no., (2) specimen no., (3) coding, (4) measurements/shank and point ratio, (5) provenience.

Example 1: A hook in 14C. 50–Ha–B20–1, W13–9, IB2(2)U HT1a a, 39x31x26 mm/1.26, I–1
Example 2: A point in 15C. 50–Ha–B20–1, J13–10, IIB1(2)A2 b4 a, 50 mm, II

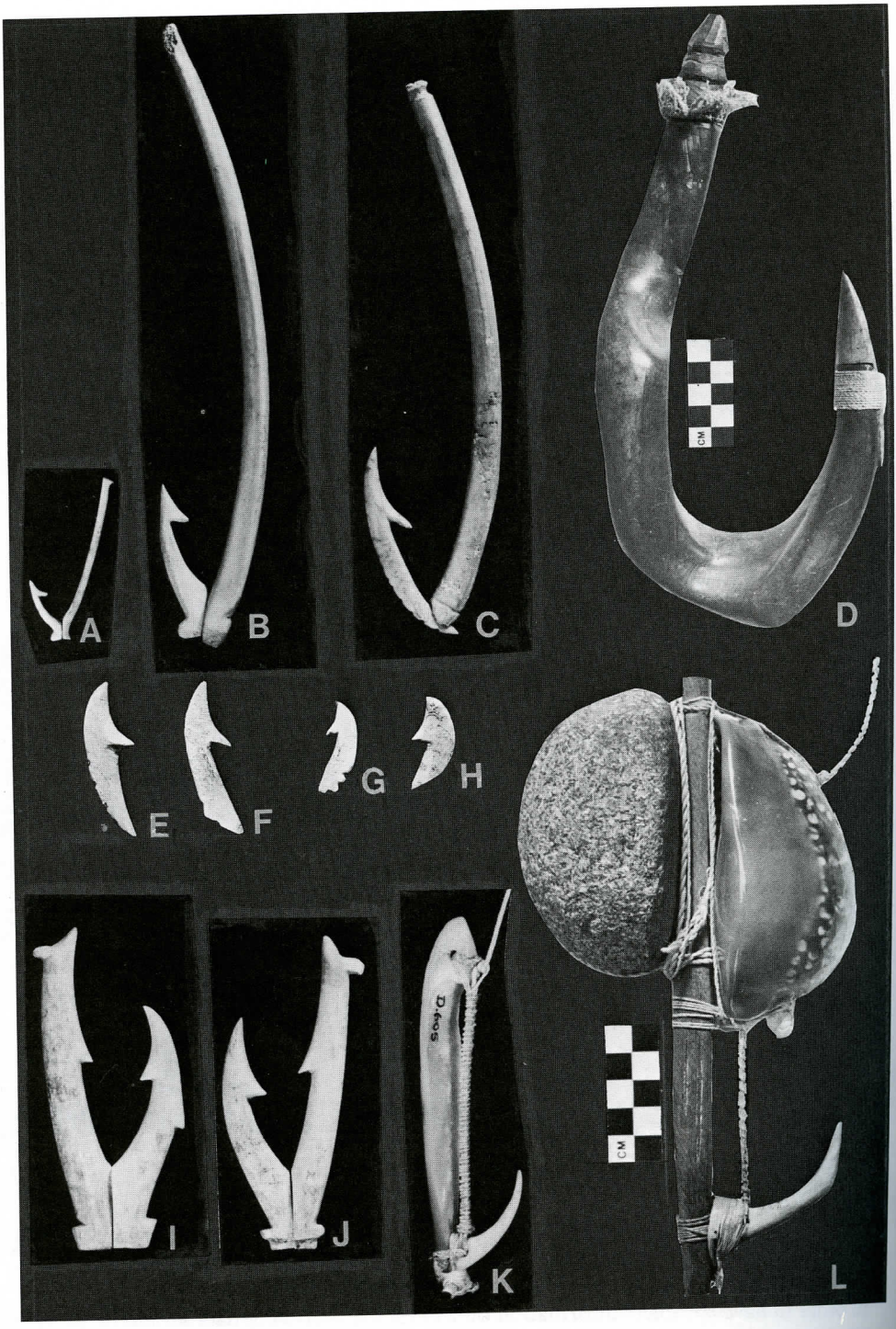

Fig. 15. Two-piece and composite hooks. Slender 2-piece hooks: **A,** IIB1(2)B3b1 a/ IIB3(1)B3b1 HT1a a; **B,** IIB1(2)B1b1 a/ IIB3(1)A1b1 a; **C,** IIB1(2)A2b4 a/IIB3(1)A1b3 HT3b a; **D,** IIA1(1)E a/IIA2(1) HT3b f, shark hook (Bishop Museum Ethnology Collection No. 6925); **E,** IIA1(2)Ab2 a; **F,** IIA1(2)Bb2 a; **G,** IIA1(2)Ca a; **H,** IIA1(2)Fa a; **I,** IIB2(2,3)B1b1 a/IIB4(5)B1b1 HT4b a; **J,** IIB2(2)B1b1 a/IIB4(5)B1b1 HT4b a; **K,** IIIA1(1)Cb1 a/IIIA3(1)B b; **L,** IIIB1(1)b1/3A1 k/41, octopus-lure (Bishop Museum Ethnology Collection No. 3794). Size 50% except D and L.

CONCLUSION

Lacking pottery culture in East Polynesia makes it hard for archaeologists to establish cultural sequences. However fishhooks can be utilized instead of pottery for such reconstructions.

The author has been working on the similar coding systems and head types for the central Polynesian fishhooks. Here also both hook types and head forms show characteristics in the different island groups as well as different time sequences within the group. The hook manufacturing methods and tools also show the localized characters in Polynesia and are useful for comparative studies.

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