LIBRARY
AMERICAN MUSEUM
AMERICAN MUSEUM
NATURAL HISTORY

ESKIMO PREHISTORY IN THE VICINITY OF POINT BARROW, ALASKA

JAMES A. FORD

VOLUME 47 : PART 1
ANTHROPOLOGICAL PAPERS OF
THE AMERICAN MUSEUM OF NATURAL HISTORY
NEW YORK · 1959

ESKIMO PREHISTORY IN THE VICINITY OF POINT BARROW, ALASKA

ESKIMO PREHISTORY IN THE VICINITY OF POINT BARROW, ALASKA

JAMES A. FORD

WITH AN APPENDIX, "SKELETAL REMAINS FROM THE VICINITY OF POINT BARROW, ALASKA," BY T. D. STEWART

VOLUME 47 : PART 1

ANTHROPOLOGICAL PAPERS OF

THE AMERICAN MUSEUM OF NATURAL HISTORY

NEW YORK : 1959

CONTENTS

INTRODUCTION 13
LANDSCAPE, SITES, AND ARCHEOLOGICAL FIELD-WORK PRIOR TO 1930 17
Archeological Sites in the Vicinity of Point Barrow 18
Stefánsson's Work at Birnirk 18
Van Valin's Work at Kugusugaruk 19
Hopson's Work at Nunavak 21
EXCAVATIONS FOR THE UNITED STATES NATIONAL MUSEUM 25
Kugok Site 25
Burial Mound A 25
Burial Mound B 28
Tests in Burial Mounds C to F 30
Comparisons of Mounds A and B 30
Cultural Content of the Kugok Burial Mounds 31
Physiography Related to the Burial Sites 32
Birnirk Site 33
Evidence for Subsidence in the Vicinity of Point Barrow 34
Excavations at the Birnirk Site 36
Mound A 37
House A 39
Structure B, Cut 5 42
Structure C 43
Structure D 44
Cut 12 44
Structure E and Included Burials 45
Structure F 46
Structure G 47
Structure H 47
Mound C, Cut 14 48
Mound D, Cut 7 49
Mound G, Cut 8 50
Mound H, Cut 9 50
Mound J, Cuts 1 and 13 51
Mound O 54
Mound R, Cut 11 and Included Burials 54
Mound S, Cut 6 55
Nuvuwaruk 55
Cut 1 56
Cut 2 56
Cut 3 56
The Nunagiak Site 56
Nunagiak and the Question of Subsidence 58
Cut 1 58
Mound A 58
Cut 2 59
Mound B 59
Cut 3 60
Cut 4 60
Burial 1 60
Find No. 1 61
Artifacts from Structures Below Mound C 61

Mound C 64
Date of the Houses Below Mound C in Terms of the Chronology of the Point Barrow Area 66
Cut 5 66
Mound H, Cut 6 67
Excavations at Utkiavik 67
Cut 1, House A 67
Cut 2 70
Location X and Cuts 3 and 4 71
House B 72
Nuwuk 73
ARTIFACTS 75
Hunting Equipment 75
Harpoon Parts 75
Harpoon Heads 75
Birnirk Open Socket 75
Oopik Open Socket 77
Naulock Open Socket 79
Tuquok Open Socket 79
Katoktok Open Socket 80
Tipiruk Open Socket 80
Tasik Open Socket 82
Natchuk Open Socket 83
Sicco Open Socket 83
Alilu Closed Socket 86
Thule Type 2 Harpoon Head 86
Nunagiak Barbed Closed Socket 87
Kilimatavik Closed Socket 89
Cape Smythe Closed Socket 89
Brower Closed Socket 90
Kuk Closed Socket 90
Barrow Closed Socket 92
Utkiavik Closed Socket 92
Nuwuk Closed Socket 93
Analysis of Harpoon Heads 93
Harpoon Blades 96
Foreshafts 97
Harpoon Socket Pieces 99
Harpoon Shafts and Methods of Splicing and Reënforcing 100
Finger Rests for Harpoon Shaft 102
Ice Picks for the Harpoon Shaft 102
Sequence of Harpoon Shaft Ice Picks 104
Lance and Lance Points 104
Seal Poke Gear 104
Float Bars 104
Seal Float Mouthpieces 105
Seal Float Plugs 105
Detachable Lance Points 105
Other Ice Hunting Gear 106
Wound Plugs 106
Wound Pins 106
Ice Scoops 106
Two-Piece Ice Scoop 108

Seal Killer . . . 109
Drag Line Handles . . . 109
Seal Scratcher . . . 109
Seal Rattles . . . 109
Net Floats, Weights, Shuttles, and Gauges . . . 109
Knives for Squeezing Out Water . . . 111
Atlatl Equipment . . . 112
Dart Shafts and Butt Pieces . . . 113
Bladder Darts, Inflation Nozzles, Socket Pieces, and Dart Points . . . 114
Bird Dart Points and Side Prongs . . . 116
Bows and Arrows . . . 118
Arrowshafts . . . 122
Arrowpoints . . . 123
Blunt Arrowpoints for Birds . . . 124
Socketed Arrowpoints with Single Barbs . . . 124
Arrowpoint Blanks . . . 124
Spurred Tang Arrowpoints without Barbs . . . 124
Spurred Tang Arrowpoints with Barbs and Stone Points . . . 126
Spurred Tang Arrowpoints with Multiple Unilateral Barbs . . . 126
Spurred Tang Arrowpoints with Single Barbs . . . 126
Spurred Tang Arrowpoints with Barbs and Notched Points . . . 126
Long Serrated Barbed Arrowpoints with Spurred or Knobbed Tangs . . . 126
Knobbed Tang Arrowpoints with Unilateral Barbs . . . 128
Knobbed Tang Arrowpoints with End Slots for Stone Blades . . . 128
Tapering Tang Arrowpoints with Unilateral Multiple Barbs . . . 128
Tapering Tang Arrowpoints with Single Barbs . . . 132
Tapering Tang Arrowpoints with Opposing Barbs . . . 132
Tapering Tang Arrowpoints without Barbs . . . 132
Unclassified Arrowpoints . . . 132
Comparisons of Arrowpoints . . . 132
Chipped Flint Points . . . 135
Wrist Guards . . . 137
Arrowshaft Wrench . . . 138
Feather Cutting Board . . . 138
Bolas Balls . . . 138
Bolas Ball Classes Found Only at Utkiavik . . . 138
Bolas Ball Classes Found at Both Utkiavik and Birnirk . . . 141
Bolas Balls That Occur Only at Birnirk . . . 141
Miscellaneous Hunting and Traveling Gear . . . 142
Snow Probe Ferrules . . . 142
Snowknives . . . 143
Snow Shovels . . . 143
Ice Staff Rings . . . 145
Snow Goggles . . . 146
Fishing Equipment . . . 147
Leisters and Salmon Spears . . . 147
Gull Hooks or Gorges . . . 150
Fishhooks . . . 150
Transportation . . . 151
Baleen Toboggans . . . 151
Sleds . . . 151
Kayaks and Umiaks . . . 156
Antler Strips, Possibly Kayak Ribs . . . 158

Men's Tools . . . 160
Men's Knives . . . 160
Crooked Knives and Side-Blade Knives . . . 160
Composite or "Splitting Knife" Handles . . . 161
Man's Knife Handles with Blade Slot in End . . . 166
Engraving Tools . . . 171
Whetstones . . . 172
Flint Flakers . . . 172
Bowdrills . . . 173
Firemaking Equipment . . . 175
Adzes . . . 178
Baleen Shaves . . . 181
Mattocks and Picks . . . 181
Wedges for Splitting Wood . . . 184
Blubber Hooks . . . 184
Women's Tools and Household Equipment . . . 186
Ulus . . . 186
Flint Sidescrapers . . . 192
Thumbnail Scrapers and Handles . . . 192
Beamers . . . 194
Cup-shaped Fat Scrapers . . . 194
Fish Scaler . . . 195
Wooden Pegs for Staking out Skins . . . 195
Ladles and Spoons . . . 196
Wooden Trays and Dishes . . . 196
Lamps and Cooking Vessels . . . 198
Pottery Paddles . . . 205
Buckets Made of Wood and Baleen . . . 205
Meat Forks . . . 207
Bone Crushers . . . 207
Combs . . . 208
Bone Awls . . . 211
Needle Cases, Thimble Holders, and Needle Case Pulls . . . 211
Ornaments and Clothing . . . 215
Toggles, Ornaments, "Butterfly" Object, and Lancet . . . 215
Perforated Polar Bear Teeth . . . 218
Clothing . . . 218
Drying Rack for Clothing . . . 221
Slat Armor . . . 221
Labrets . . . 221
Drums, Pipes, Toys, and Unidentified Objects . . . 222
Drums and Drum Parts . . . 222
Pipes . . . 227
Trinket Boxes . . . 227
Toys and Objects Possibly Used as Toys . . . 227
Miscellaneous Baleen Objects . . . 229
Unidentified Objects . . . 230
CONCLUSIONS . . . 231
Comparison of Harpoon Head Chronologies from Bering Strait to Central Canada . . . 231
Harpoon Heads with Stone Side Blades or Barbs at Right Angles to the Line Hole . . . 233
Harpoon Heads with Side Blades in the Plane of the Line Hole . . . 234
Open Socket Harpoon Heads with Blade Slit in Same Plane as Line Hole . . . 234
Harpoon Heads with Blade Slit at Right Angles to the Line Hole . . . 235

Closed Socket Harpoon Heads 236
Trait Comparison 238
Derivation of the Birnirk Culture 238
Relative and Calendrical Dating of the Point Barrow Sequence 242
APPENDIX: SKELETAL REMAINS FROM THE VICINITY OF POINT BARROW, ALASKA. T. D. STEWART 245
LITERATURE CITED 256
CATALOGUE DATA FOR CERTAIN ILLUSTRATIONS 259
INDEX 269

TABLES

1. Flint Arrowpoints 136
2. Men's Knives 169
3. Engraving Tools 171
4. Whetstones 172
5. Flint Flaker Handles and Points 173
6. Bowdrill Parts 175
7. Adze Parts 180
8. Mattocks and Picks 183
9. Wedges for Splitting Wood 185
10. Ulu Handles and Slate Blades 188
11. Flake Sidescrapers 192
12. Skin Scrapers 193
13. Wooden Pegs for Staking Out Skins 195
14. Ladles and Big Spoons 196
15. Pottery and Soapstone 200
16. Baleen Buckets 206
17. Meat Forks from Birnirk 207
18. Combs 208
19. Awls Made of Deer and Bird Bone 212
20. Sewing Gear 214
21. Line and Ornamental Toggles 215
22. Drum Parts 223
23. Toys 228
24. Chronological Division of Point Barrow Eskimo Skulls Measured by Hrdlička (1942) . . 246
25. Portion of Van Valin Collection from Kugusugaruk Presently in the United States National Museum (Field Numbers and Current Museum Numbers) 247
26. Chronological Division of Skulls from the Ford Collection from the Vicinity of Utkiavik Measured by Hrdlička (1942) 247
27. Statistical Comparisons of Cranial Measurements: Male 248
28. Statistical Comparisons of Cranial Measurements: Female 252

ILLUSTRATIONS

PLATES

(AT END)

1. Air photograph of the Birnirk Site
2. a. Camp on the beach at the Birnirk Site in 1936. b. Mealtime in archeological camp
3. a. Beginning excavation in Mound A, Birnirk Site, in 1932. b. Excavating House A, Mound A, Birnirk
4. a. Burials in Structure E, Mound A, Birnirk. b. Baleen toboggan found in Section 5, Cut 6, Mound S, Birnirk
5. a. Removing the polar bear skin bedding from the floor of the house in Mound C, Birnirk. b. Entrance tunnel and floor of house in Mound C, Birnirk
6. a. Kugok Burial Mound A. b. Burials 5, 6, and 7 in Kugok Burial Mound B
7. a. Work in the structures below Mound C at Nunagiak which yielded artifacts of Punuk art style. b. Excavating Cut 4 in Mound C at Nunagiak
8. Male skull from Burial Mound A, House E, Birnirk, collected by Ford
9. Male skull collected by Van Valin at Kugusugaruk
10. Male skull collected by Van Valin at Kugusugaruk
11. Female skull collected by Van Valin at Kugusugaruk
12. Female skull collected by Van Valin at Kugusugaruk
13. Female skull collected by Van Valin at Kugusugaruk

TEXT FIGURES

1. Map of north coast of Alaska in the vicinity of Point Barrow 14
2. Copies of Van Valin's sketches of Burial Areas 1 to 4 at the Kugusugaruk Site . . . 20
3. Copies of Van Valin's sketches of Burial Areas 5 and 6 at the Kugusugaruk Site . . . 21
4. Wooden bows secured by Van Valin at the Kugusugaruk burial site 22
5. Map of the north and south Nunavak lagoons 23
6. Sketch map of Barrow Village as it was arranged in 1932 26
7. Map of burials and finds in Kugok Mound A 27
8. Map of burials and accompanying artifacts in Kugok Mound B 28
9. Artifacts accompanying burials in Kugok Mounds A and B 29
10. Artifacts from Kugok Mounds A and F 31
11. Contour map of the Birnirk Site made in 1953 34
12. South to north cross-section of the Birnirk Site based on the contour map (Fig. 11) . . 35
13. Map and section of the excavations in Mound A, Birnirk 38
14. Burials in Structure E, Mound A, Birnirk 45
15. Thin, wooden, dish-like object found with the burials in Structure E, Mound A, Birnirk 46
16. House in Mound C, Birnirk Site 48
17. Plan and section of House A, Mound J, Birnirk 52
18. Plan of house, Mound R, Birnirk 54
19. Contour map of Nunagiak Site made in 1953 57
20. Structures uncovered in the lagoon beach below Mound C, Nunagiak 61
21. Artifacts from the structures beneath Mound C, Nunagiak, and from the adjacent beach of the lagoon 62
22. Complete arrow from Burial 1, Structure F, below Mound C, Nunagiak. 63
23. Scapula snow shovel with handle, found in Entrance D, in the beach sands below the eroding Mound C, Nunagiak 65
24. Plan of House A, Utkiavik Site 68
25. Plan of House B, Utkiavik Site 72
26. Harpoon heads of Birnirk Type from the Birnirk Site 76
27. Harpoon heads of Alilu, Oopik, and Naulock types from the Birnirk Site 78

28. Harpoon heads of Tuquok, Katoktok, Tipiruk, and Tasik types 81
29. Harpoon heads of Natchuk Type. 84
30. Harpoon heads of Sicco and Thule 2 types 85
31. Harpoon heads of Nunagiak and Kilimatavik types 88
32. Harpoon heads of Cape Smythe, Brower, Kuk, and Barrow types 91
33. Harpoon heads of Nuwuk and Utkiavik types 94
34. Tabulation of the provenience of harpoon heads of the different types . . . . *facing* 94
35. Diagram showing the relative frequencies of the harpoon head types at the four prominent sites in the vicinity of Point Barrow 95
36. Varieties of harpoon head blades found in the Point Barrow Area 97
37. Harpoon gear from Nuwuk and Utkiavik 98
38. Harpoon gear from Nunagiak 99
39. Harpoon gear from Birnirk 101
40. Harpoon gear from Birnirk 103
41. Wound plugs and pins from Birnirk 106
42. Ice scoops from the recent sites 107
43. Ice scoop parts from Birnirk 108
44. Ice scoop with baleen rim and netting from Birnirk. 108
45. Darting harpoon gear and seal netting equipment from the later deposits 110
46. Baleen fish net from Utkiavik 111
47. Bone knife, supposedly for squeezing water from the skins of caribou lanced while they were swimming 111
48. Atlatl gear from Nunagiak 113
49. An atlatl from the Birnirk Site. 114
50. Atlatl gear from Birnirk 115
51. Atlatl parts from Birnirk 115
52. Bird dart side prongs from Utkiavik 117
53. Bow gear from Nuwuk and Utkiavik 119
54. Bow gear from Nunagiak 120
55. Bow gear of Birnirk Period 121
56. Portion of a bow case, made of de-haired sealskin, from Birnirk 122
57. Antler arrowpoints, principally from Nuwuk and Utkiavik 125
58. Antler arrowpoints, principally from Nuwuk and Utkiavik 127
59. Antler arrowpoints, principally from Nunagiak. 129
60. Arrows and antler points with knobbed tangs, principally from Birnirk 130
61. Arrows and points with tapering tangs from Kugok, Birnirk, and Nunagiak 131
62. Ownership marks on arrowpoints from Nuwuk, Utkiavik, and Nunagiak 133
63. Tabulation of the occurrence of arrowpoints of different types 134
64. Classes of flint arrowheads 135
65. Tabulation of the occurrence of bolas ball types 139
66. Bolas ball classes A to M 140
67. Snow-handling equipment from Nuwuk and Utkiavik 142
68. Snow-handling equipment from Birnirk 144
69. Baleen ring for walking stick from Birnirk. 145
70. Snow goggles from Birnirk 146
71. Fishing gear from Nuwuk and Utkiavik 148
72. Fishing gear from Nunagiak 148
73. Fishing gear from Birnirk 149
74. Baleen toboggan from Birnirk 152
75. Sled and boat parts from Utkiavik and Nuwuk 153
76. Sled and boat parts from Nunagiak 154
77. Sled parts and equipment from Birnirk 155
78. Toy boats made of bark from Birnirk 157

79. Boat parts from Birnirk 159
80. Antler strips, probably kayak ribs, from Birnirk 160
81. Men's knife handles, blades, and a whetstone from Nuwuk and Utkiavik 162
82. Men's knife handles, blades, and a whetstone from Nunagiak 163
83. Men's knife handles, blades, and a sharpening stone from Birnirk 164
84. Drill and adze parts from Nuwuk and Utkiavik 176
85. Drill and adze parts from Birnirk 177
86. Complete adze from Birnirk 179
87. Picks and mattocks from Nuwuk, Utkiavik, and Nunagiak 182
88. Mattocks and bone wedges from Birnirk 184
89. Blubber hooks from Nuwuk and Utkiavik 185
90. Women's knives and scrapers from Nuwuk and Utkiavik 187
91. Women's knives and scrapers from Nunagiak 190
92. Women's knives and scrapers from Birnirk 191
93. Household containers from Nuwuk and Utkiavik 197
94. Containers and tools from Nunagiak 198
95. Containers from Birnirk 199
96. Pottery vessel from Utkiavik 199
97. Pottery fragments and a lamp fragment from Nunagiak 202
98. Pottery and lamp fragments from Birnirk 203
99. Pottery paddle made of whale bone, from Birnirk 204
100. Combs and sewing gear from Nuwuk and Utkiavik 209
101. Toggles, dolls, and combs from Nuwuk and Utkiavik 210
102. Combs and needle cases from Nunagiak 211
103. Awls, needle cases, and ornaments 213
104. Ornaments and problematical objects from Birnirk and Nuvuwaruk 216
105. Small items from Birnirk 217
106. Clothing from Birnirk 219
107. Baleen rack used to hang above the lamp for drying clothing 220
108. Labrets from Utkiavik 221
109. Wooden drum rim and handle from Birnirk 223
110. Dolls from Birnirk and Nunagiak 224
111. Objects from Nuwuk and Utkiavik 225
112. Objects from Birnirk 226
113. Comparison of the chronologies of harpoon heads with stone side blades or barbs placed at right angles to the line holes . . . . . *facing* 232
114. Comparison of the chronologies of harpoon heads with side blades in the same plane as the line holes . . . . . *facing* 232
115. Comparison of chronologies of harpoon heads with slate for blades in the same plane as the line holes . . . . . *facing* 232
116. Comparison of the chronologies of harpoon heads with slits for the blades at right angles to the line holes . . . . . *facing* 232
117. Comparison of the chronologies of closed socket harpoon heads. . . . . *facing* 232
118. Diagram showing the number of specific traits that link Birnirk with earlier cultural stages in the Western Arctic, the Thule Culture of Central Canada, and the Nuwuk-Utkiavik occupation of the Point Barrow Area 239

INTRODUCTION

DURING THE SUMMER OF 1930 I had the privilege of assisting Henry B. Collins, Jr., of the Bureau of American Ethnology, Smithsonian Institution, in the excavation of a remarkable sequence of prehistoric Eskimo sites near the village of Gambell, on St. Lawrence Island in Alaska. This work revealed in unusual detail some 2000 years of Eskimo prehistory, providing a standard by which the accumulated scattered bits of information bearing on Western Eskimo history could be ordered.[1]

When the archeological collections that had been made by Vilhjalmur Stefánsson, Knud Rasmussen, W. B. Van Valin, and Fred Hopson in the vicinity of Point Barrow were interpreted on the basis of information provided by the St. Lawrence Island excavations, it appeared very probable that the old sites along the north coast of Alaska held the key to the development of the Thule Culture of the Central Canadian Arctic and Greenland. This early maritime Eskimo culture had been investigated and reported by Therkel Mathiassen and other workers on the Fifth Thule Expedition of the Danish National Museum headed by Knud Rasmussen during the preceding decade. Mathiassen had concluded that the bearers of this culture probably came from northern Alaska and cited considerable evidence in support of this theory.[2]

It was obvious that the next step in an archeological program in the western part of the Eskimo Area should be systematic excavation at the old sites in the vicinity of Point Barrow. Unfortunately, Collins was faced with several years' study of the collections and the preparation of a report on the very productive work on St. Lawrence Island in the field seasons of 1928–1930. Consequently, he very generously arranged that the United States National Museum send me to Point Barrow to undertake the needed investigation.

In the summer of 1931 I traveled from Seattle to Nome aboard the Coast Guard Cutter "Northland," and from Nome to Barrow aboard the "M. S. Patterson," a trading vessel then en route to Herschel Island. On the latter leg of the trip I was the guest of Captain Theodore Pedersen. That summer, unfortunately, unusually bad ice conditions prevailed in the Arctic Ocean. We did not arrive at Barrow until the middle of August, two weeks before the end of the brief summer season during which the ground thaws. However, while the "Patterson" lay south of the ice pack as it moved slowly northward, there was an opportunity to examine much of the coast, and excavations were started in several old sites. Work was begun at the Birnirk Site near Barrow, but could be continued for only 10 days owing to the onset of the freeze-up.

After the United States National Museum gave me permission to pass the winter at Barrow, I took the opportunity during the month of September to go east to Barter Island aboard the small schooner "Trader." The weather was bad and the ice difficult. Although we called at every native settlement along the north coast and questioned the Eskimo about old sites, little new information was gathered.

The winter of 1931–1932 was far from dull. Most of the cold months when I was in Barrow Village, I lived with the medical missionary, Dr. Henry B. Griest; in the spring I used facilities offered me by Mr. Charles D. Brower, the well-known trader. In the fall I joined a boat crew, and we killed a bowhead whale east of Point Barrow and towed it to the new land-fast ice at the Point. As my portion of the kill, the Eskimo detached the skull and hauled it up onto the beach where it could be protected from the dogs by a covering of ice blocks. In the summer of 1932 this skull was shipped to Seattle on the sailing schooner "Holmes" and is now on display at the United States National Museum.

In October the annual reindeer round-up was held at Walakpa, 20 miles southwest of Barrow. By working in three shifts, we passed 12,000 deer through the corrals, killing, castrating, and marking chutes in seven days. A supply of skins for winter clothing and meat for the archeological camp for the following summer were my compensation for helping in this work.

Early in the fall, Sergeant Stanley Morgan of the United States Army Signal Corps, stationed at Barrow to operate the wireless telegraph station, Mr. John Trendle, the school teacher, and I completed the transformation of

[1] Collins, 1937.
[2] Mathiassen, 1927b.

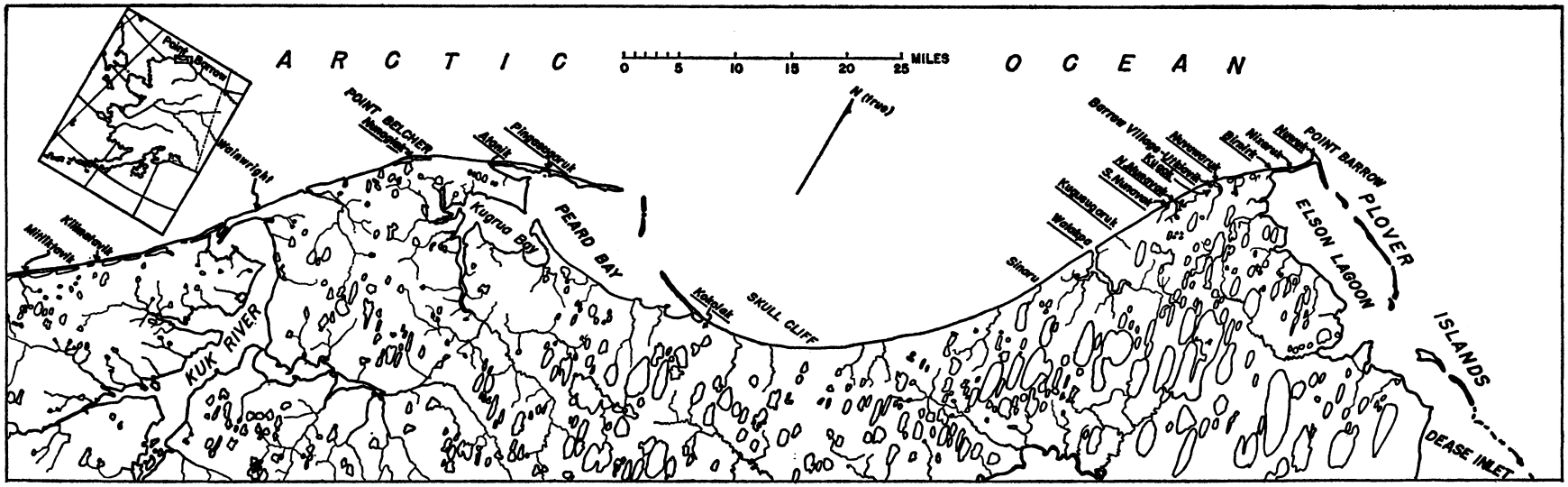


FIG. 1. Map of the north coast of Alaska in the vicinity of Point Barrow. The names of old Eskimo villages and burial sites referred to in the text are underlined. Nuwuk, Utkiavik (Barrow Village), and Wainwright, 85 miles down the coast, were occupied in 1930.

a Model T Ford chassis into a rather primitive snowmobile. With occasional difficulties this machine operated fairly well on the smooth sea-ice just off the beach. We made trips to the deer corral, to Wainwright, 100 miles to the southwest, and to the camp of the crew of the steamer "Baychimo," frozen in near the Sea Horse Islands, covering a total of 1300 miles by this means. In the early spring I made an interesting trip with Alfred Hopson, with dogs and sleds, to the oil seeps at Cape Simpson, 100 miles east of Barrow. The purpose was to bring back two sled loads of asphalt to be used as fuel.

In 1932 spring whaling began May 2, when I joined Dave and Bobby Brower's boat crew. We spent six weeks camping at various places along the shifting leads 5 to 10 miles from shore. Although we saw many whales, we did not kill one. Only two whales were taken at Barrow that spring.

Archeological work began the second week in June, and with a crew of three to four Eskimo I excavated principally at the Birnirk Site (Fig. 1). Brief periods were also spent at Nuwuk (Point Barrow), Nuvuwaruk (near Brower's Trading Post), and in Utkiavik Village (Barrow), working on Birnirk Period burials at Kugok near Utkiavik, at Nunavak (6 miles south of Barrow Village), and at Walakpa. The season of thaw terminated at the end of August, and I left Barrow in the Bureau of Education supply ship "North Star."

In 1936 Collins planned to excavate the series of old sites near Cape Prince of Wales and invited me to assist him again. After the Wales dig was started and running smoothly, it was decided that I should return to the vicinity of Point Barrow and continue the work started there. Accordingly I caught the mail boat to Kotzebue where, after a slight delay, passage was secured in a small launch with an Eskimo en route to Point Hope to trade for *muktuk* (black skin of the whale) and seal oil. At Kivilina, a village midway between these points, two Eskimo were hired for the summer, and at Point Hope we rented an 18-foot skin boat. I had brought along a 10-horsepower outboard motor which, mounted on the umiak, made an excellent craft capable of about 10 miles per hour when fully loaded. We left Point Hope on July 22, passed Cape Lisburne with its great murre rookeries, and after several days' delay, due to heavy seas, reached the village of Wainwright. Inquiries were made of the Eskimo at Point Lay and Icy Cape, and most of the probable localities that might have provided sites for old villages were examined, but no very old ruins were found. The middens of Mitliktavik and Kilimatavik, 12 miles southwest of Wainwright, were examined. These villages, each of about a dozen house pits, were abandoned within the memory of living Eskimo and could not have been inhabited for more than a hundred years, judging from the artifacts we gathered there.

Northeast of Wainwright the ice was tight on the beach, and after some difficulty we reached the abandoned site Nunagiak, where I had worked briefly in 1931. Here we stayed for two weeks, continuing the cuts started in 1931 and opening new cuts in promising parts of the ruin. The recently abandoned village of Atanik and the slightly older ruin of Pingasugaruk were examined, but nothing was found at either that extended as far back as the Thule Period. On the trip to Barrow, we examined the mouth of each small stream, but with no new results. The last two weeks in August and the first part of September were spent at the Birnirk Site. The return trip to Nome was made aboard the small schooner "Trader."

The collections resulting from this work were returned to the United States National Museum, but unfortunately funds were not available to permit me to work on them. The material was stored until 1952, when it was brought to the American Museum of Natural History for cataloguing and study.

The third opportunity to visit the archeological sites in the vicinity of Point Barrow was offered me in the summer of 1953. Under the auspices and support of the Arctic Research Laboratory, established at Barrow by the Office of Naval Research, a group of Harvard University graduate students, headed by Wilbert Carter, was completing a three-season program of archeological work in the old sites near Point Barrow. Through the courtesy of Mr. Carter and Dr. John Otis Brew, Director of the Peabody Museum at Harvard University, I was invited to join this field party. Scheduled flights from Fairbanks to Barrow solved the problem of transportation, and more than adequate housing was provided by the facilities the Navy had established there. My principal contribution was a 1-foot-interval

contour map of the Birnirk Site and a similar map of the Nunagiak Site. To obtain the latter, Carter and I, accompanied by a young native of Wainwright, traveled down the coast in an umiak with an outboard motor. It is indicative of the changes in transportation that, although this 18-year old boy was raised at Wainwright and had been working for the Navy at Barrow for several summers, he had never made the trip along the coast by boat or dog team; he had traveled by air.

In 1952 the United States National Museum lent me the still uncatalogued collection. It was brought to the American Museum, and the task of plowing through the material and the rather cold field-notes was begun, only to be frequently interrupted by other projects. A number of people have assisted in the detailed compilations so necessary when reporting on the prehistory of a gadget-burdened culture like that of the Eskimo. Mr. Charles Ward, Miss Frances Brownstein, and Miss Miriam Mulqueen did the cataloguing. Mr. Ernest A. Neilson assisted with the tabulations. Mrs. Marilyn Weber made approximately the first half of the illustrations; the remainder were drawn by Mr. Nicholas Amorosi. In the later stages of assembling and correcting, I have been assisted by Miss Joyce Firstenberg. Miss Bella Weitzner has revised the manuscript in her usual capable fashion.

To the University Museum of the University of Pennsylvania I am grateful for the loan of specimens and notes from the Van Valin Collection.

Had it been possible to study and report upon these collections soon after the completion of the field-work, I would have been able to present this study as a substantial contribution to the unraveling of Eskimo prehistory. However, since the early 1930's, excellent studies of the archeology of the Arctic Coast of Alaska have been made by Larsen and Rainey and by Giddings. Comparative studies have been published by De Laguna, and summaries by Collins. The sequence in the vicinity of Point Barrow has been neatly bracketed by this work, and for two decades specialists in Eskimo prehistory have had a rather clear idea as to the cultural content of each period to be found there. This, then, is in the nature of a mopping-up job.

LANDSCAPE, SITES, AND ARCHEOLOGICAL FIELD-WORK PRIOR TO 1930

THE BROOKS RANGE, extending eastward from Point Hope and Cape Lisburne and trending northward to approach the sea near Barter Island and Demarcation Point, divides the drainage of the Yukon, the Kobuk, and the Noatak rivers from the streams flowing northward into the Beaufort Sea. The Colville, the largest of these streams, flows from west to east along the foothills of the range for 200 miles before it bends northward to empty into Harrison Bay, 150 miles east of Point Barrow. Foothills rising to 2500 feet above sea level lie north of the Colville, but beyond these hills a coastal plain, beginning at an elevation of about 50 feet above sea level, slopes gently northward to the coast, a distance of 80 to 100 miles. This has been described by Leffingwell.[1] The country is gently rolling where the poorly developed drainage patterns of the Kuk, Kugrua, Inaru, Meade, Topagoruk, and Chipp rivers have been incised. For the most part, however, this plain, level as far as the eye can see, is covered with reindeer moss and other low-growing arctic plants, and intricately interlaced with patterns of frost cracks that have raised low ridges that hold shallow ponds of water all summer, superficially like artificial rice paddies.

In addition, this treeless plain, particularly the lower-lying north portion, is rather evenly dotted with hundreds of rather peculiar shallow lakes. These lakes tend to be elongated, with straight parallel sides and rounded ends, and to have similar proportions of width to length regardless of size. Roughly three times as long as wide, they vary in length from 100 yards to as much as 5 miles. Their most peculiar aspect is their orientation: the longer axes are parallel, and all trend slightly west of north and east of south. In arrangement they apparently have no connection with the present drainage pattern; indeed, most of them are not connected to one another or to nearby drainage streams. The west coast appears to be retreating, as is discussed below (p. 34). In 1953, at one point near the base of the sand spit that forms the northeastern enclosure for Peard Bay, I observed several of these lakes that had been cut into and drained by the encroaching sea. The basins were only 5 to 6 feet deep, and the bottoms of these extinct lakes were flat.

The coastal plain is underlain by hard rock of earlier geological ages, but nearly everywhere there is a thin capping of sand and silt, apparrently of Pleistocene age, for elephant bones are found in it. The elongated lakes appear to be formed in these late soils. Black and Barksdale[2] have published detailed descriptions of these interesting features but have reached no conclusion as to their origin. Apparently they are in some way related to the permafrost phenomena.

The Arctic Coast in the vicinity of Barrow (Fig. 1) has been well described by Ray,[3] Murdoch,[4] Leffingwell,[5] and others. Along the coast, east of Barrow, the coastal plain slopes gently to the sea. The coast line is indented with numerous bays and inlets, and there are many bars and small sand islands in the shallow waters off the coast. Elson Lagoon, protected on the north by a chain of islands, the Plover Islands, extends 35 miles east from the Point Barrow sand spit. In contrast, the coast southwest from Utkiavik is almost straight, slightly curving for a distance of 60 miles to the head of Peard Bay. The coastal plain here terminates in a low bluff that is nowhere over 50 feet high. Southwestward from Point Franklin offshore sand beaches have built up and enclose protected lagoons almost continuously to Cape Beaufort, south of Point Lay. Low bluffs at Wainwright mark the only point where the coastal plain approaches the present beach.

The climate, precipitation, and ocean currents along the coast have also been well described in the references cited above.

In the discussion that follows there is an excellent chance of confusion in the way in which the names "Barrow" and "Point Barrow" are used. The name "Point Barrow" is generally used when the region is referred to. Specifically, however, it is the end of the sand spit that forms the northernmost point of the North American mainland (Fig. 1). The recently aban-

[1] Leffingwell, 1919, 52–54.

[2] Black and Barksdale, 1949.

[3] Ray, 1885.

[4] Murdoch, 1892.

[5] Leffingwell, 1919.

doned Eskimo village of Nuwuk is situated here.

The confusion arises from the fact that the Post Office located at the Eskimo village of Utkiavik, 10 miles southwest of Nuwuk, is officially named Barrow, Alaska. Barrow Village, then, is a term that is used interchangeably with Utkiavik.

ARCHEOLOGICAL SITES IN THE VICINITY OF POINT BARROW

Eastward from Point Barrow I did not succeed in locating any new archeological sites, although I visited the Thule Period site on Barter Island excavated by Diamond Jenness. Stefánsson[1] mentions ruins on the Jones Islands east of the mouth of the Colville River. The geological surveying parties that have been working so intensively in the region in recent years have found house ruins on the banks of the streams that flow north into Beaufort Sea, but I have no information to contribute about these sites.

The old sites that I have examined lie along the west coast. They are shown on the map (Fig. 1) and briefly described below.

NUWUK (POINT BARROW): An occupied village in 1936, but now abandoned. North of the occupied houses along the beach are a number of old house pits. Nothing preceding the Recent Period was found.

NIXERUK (SMALL HOOK): A small, hook-shaped, sand spit that projects into Elson Lagoon about midway on the narrow sand spit that connects Point Barrow (Nuwuk) with the mainland. Skeletons from surface burials were collected here. There were no accompanying artifacts, and the skeletons are probably not very old.

BIRNIRK: A group of mounds formed by superimposed houses (Fig. 11). This is the locality where the major part of Stefánsson's collection was made,[2] where I worked principally, and where a group of Harvard University students, directed by Wilbert Carter, excavated in the seasons of 1951, 1952, and 1953.

NUVUWARUK: This site is referred to by Ray, as follows: "On the point where the station was established were mounds marking the site of three huts dating back to the time when they had no iron and men 'talked like dogs.'"[3] Brower's trading post was placed on the site of Ray's station, and dwelling houses rather completely covered this area. By 1953 recent grading with bulldozers had removed these deposits. Two cuts were made here, and the artifacts recovered are Birnirk in age (Fig. 6).

UTKIAVIK: These are the recently abandoned houses of Utkiavik Village. Many of these structures, which were occupied until the Eskimo moved into above-ground wooden houses, contain abundant iron and glass. Several excavations were made here to obtain a sample of recent artifacts (Fig. 6).

KUGOK: A group of Birnirk Period burials in the tops of small knolls on both sides of Kugok ravine (Fig. 6). These burials seem to be Early Birnirk.

NUNAVAK: A group of mounds with burials in the top excavated by A. H. Hopson in 1929 for the University Museum, Philadelphia; Birnirk in age (Fig. 5).

KUGUSUGARUK: The group of six burial mounds excavated for the University Museum by Van Valin in 1918–1919.[4]

WALAKPA: Several burial mounds were excavated here by Hopson in 1929. Results unknown.

KUKULIK: Several recent houses. No excavation.

PINGASUGARUK: Several recent house mounds. I made a surface collection but did not excavate.

ATANIK: Recent house ruins. Surface collection; no excavation.

NUNAGIAK: House mounds ranging in age from Late Birnirk to recent. I excavated here (see Fig. 19). This is the only site along this coast that seems to have been extensively occupied in the Thule Period.

KILIMATAVIK: Recent house ruins. Surface collection; no excavation.

MITLIKTAVIK: Recent house ruins. Surface collection; no excavation.

STEFÁNSSON'S WORK AT BIRNIRK

On August 1, 1912, Stefánsson dug into one of the mounds at Birnirk which is described as being 12 feet high and 126 paces in circumference.[5] This description seems to fit Mound H better than any other. He managed to excavate to a depth of 3 feet over what appeared to be a

[1] Stefánsson, 1914, 9.
[2] Wissler, 1916.
[3] Ray, 1885, 37.
[4] Mason, 1930.
[5] Stefánsson, 1914, 393.

house entrance. Stefánsson's journal suggests that he actually excavated at Birnirk just one day, and that conforms to what Charles Brower told me in 1931. The balance of the collection which Stefánsson obtained from Birnirk was excavated by the Eskimo and purchased from them by Brower, acting for Stefánsson. This collection is now in the American Museum of Natural History. Harpoon heads and arrowheads have been described by Wissler.[1]

VAN VALIN'S WORK AT KUGUSUGARUK

At the Twenty-third Congress of Americanists held at New York in 1928, J. Alden Mason of the University Museum, University of Pennsylvania, reported on work which had been conducted for the museum in the vicinity of Barrow from 1917 to 1919 by a school teacher, W. B. Van Valin. He had discovered and explored the remains of what he called six houses, located in tundra knolls southward from the village of Utkiavik.

According to Mr. Van Valin's notes, the sizes and shapes of the "houses" varied greatly, ranging between 45 by 18, 15 by 10, 15 by 15 ft.; apparently all were rectangular. These structures were all built of driftwood. The walls were made of wood placed vertically and apparently were originally of two to three feet in height. The roofs were formed of parallel logs which reached from the tops of the side walls to the ridge poles. A thick covering of sods was then placed over the roofs and the walls, consisting of two layers of rectangular pieces of tundra, decomposed moss and grass, about two feet long, eighteen inches wide, and six inches thick. In each roof a frame was built for a skylight which was covered with seal or walrus entrails. The bottoms of the largest buildings were from four and a half to five feet below the tops of the mounds (presumably after the roofs had fallen in). No ice-cellars for storing food were discovered, in spite of search.[2]

Mason continues to the effect that in these houses, Van Valin found the remains of 83 persons, dressed in parkas made of bird and animal skins, and lying in rows on beds of brown bear, polar bear, and musk-ox hides.

Specialists on Eskimo archeology have never been quite satisfied with this description of charnel houses. This appeared to be a unique example, entirely at variance with burial customs elsewhere. Moreover, the description fits perfectly the recent Point Barrow dwelling house, even to the detail of gut skylight window, a feature that could hardly be determined from a collapsed building.

At Mason's invitation I examined the file of notes and letters pertaining to the Van Valin Collection at the University Museum and then borrowed the entire file to study in New York. Van Valin's manuscript "final report" was faithfully quoted by Mason. However, now also in the file are photographic prints of drawings that Van Valin evidently made while excavating the site. A note on the envelope containing these prints states that they were received in the University Museum in 1942, more than a decade too late to have been utilized by Mason in preparing his 1928 paper. These drawings have been recopied to make them more legible and are reproduced here as Figs. 2 and 3. The longhand notes on the drawings are not always intelligible. The sketches show that the skeletons were laid out on wooden platforms, and there are numerous stumps of posts.

It is not possible from Van Valin's notes to locate the "Old Igloo" Site exactly. However, in 1928, when Mason became interested in working up Van Valin's collection, arrangements were made to have Alfred H. Hopson, a long-time resident of Barrow, continue collecting for the University Museum. Hopson had been present when Van Valin worked in 1918–1919 and was still living at Barrow when I worked there in 1931–1932. From Hopson's letters it is possible to deduce that Van Valin worked at a locality called Kugusugaruk, about 10 miles southwest of Barrow Village (Fig. 1). Translated, this name seems to mean "similar to a small river," a very apt name for the ravine beside which the mounds were located.

Unfortunately, I did not visit the Kugusugaruk Site. Until the file of notes at the University Museum was examined, I was under the mistaken impression that Van Valin had excavated at Nunavak. Hopson, as his letters show, certainly knew where Van Valin had worked, but, as he was convinced that nothing more was to be found at Van Valin's site, probably did not think it necessary to mention it to me.

Van Valin's collection from Kugusugaruk has been described and illustrated by Mason,

[1] Wissler, 1916.

[2] Mason, 1930, 383. This description is repeated in Van Valin's book: Van Valin, 1941, 227–238.

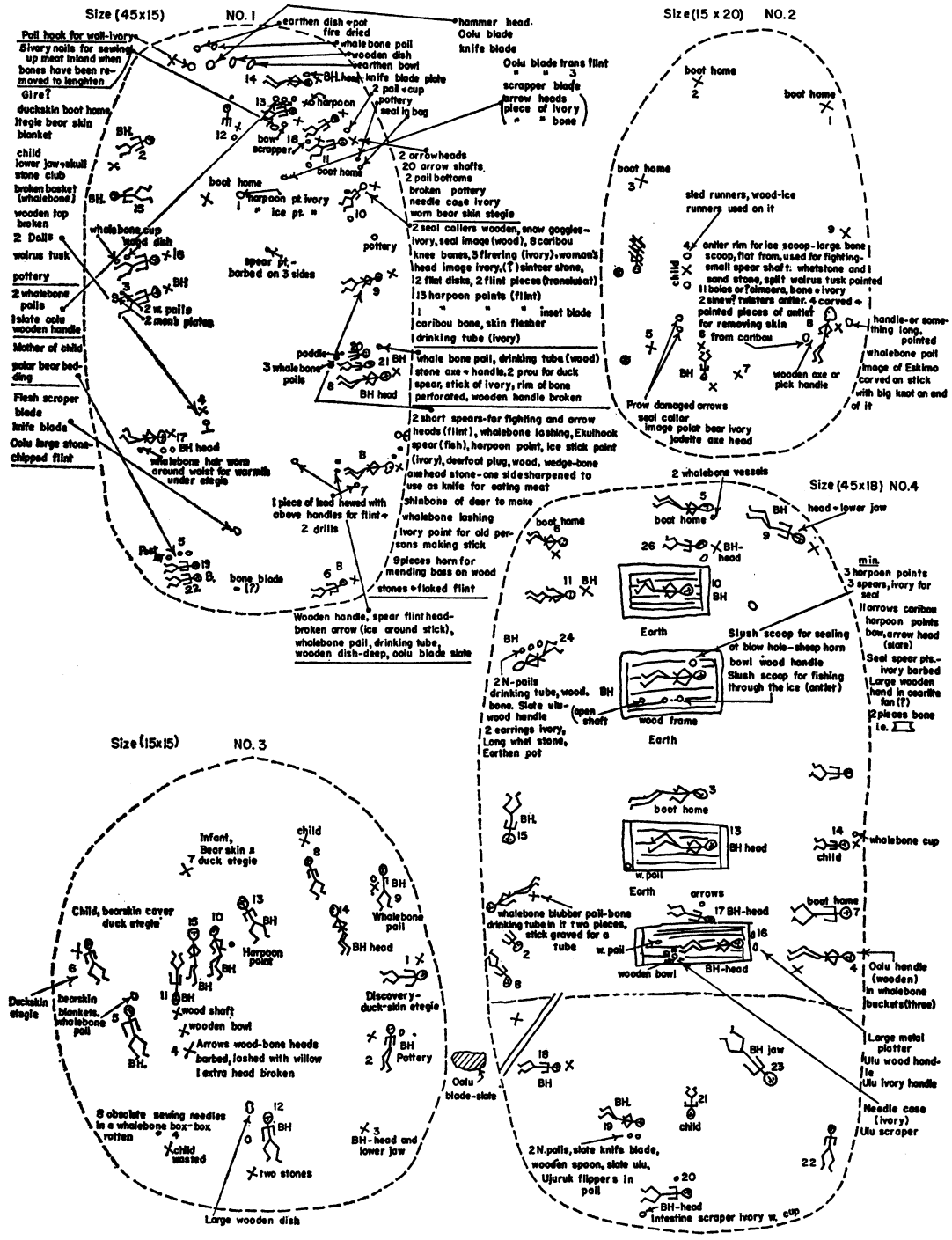


FIG. 2. Copies of Van Valin's sketches of Burial Areas 1 to 4 at the Kugusugaruk Site. The accompanying notes, written in script, have been transcribed as accurately as possible, but are not always clear.

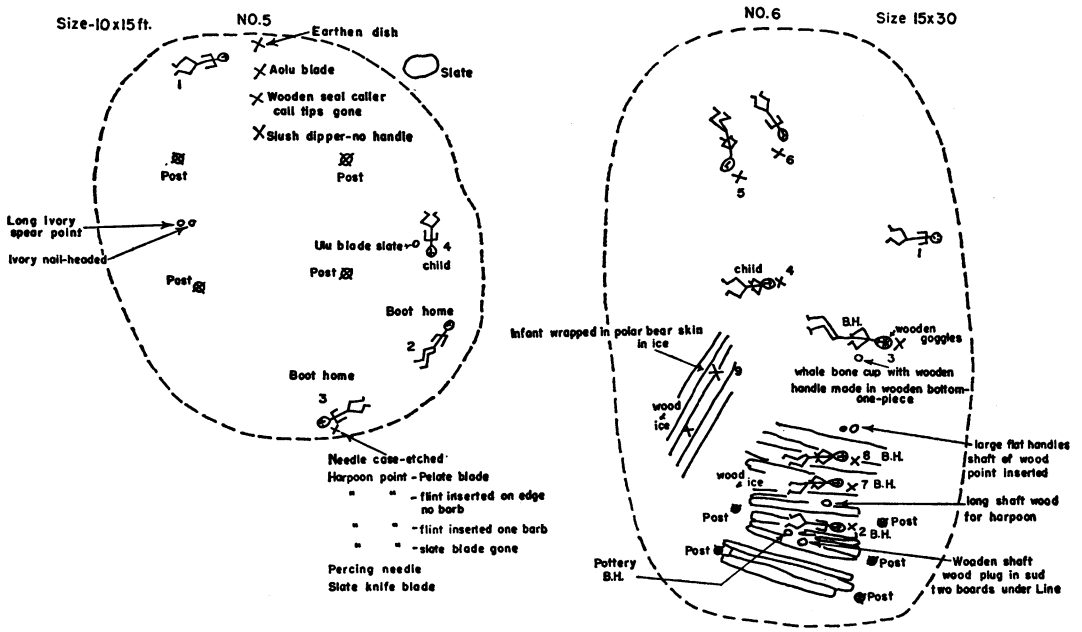


FIG. 3. Copies of Van Valin's sketches of Burial Areas 5 and 6 at the Kugusugaruk Site.

and there seems to be no point in repeating this description. The sketches of the burials (Figs. 2 and 3) list the artifacts found with each, but as the items were not given field numbers they cannot be identified. Three wooden bows that Mason did not illustrate are shown in Fig. 4. These excellently preserved bows seem to have had sinew cable backing, for there are faint marks of the lashings on the wood.

The harpoon heads which Van Valin obtained from Kugusugaruk have been classified and are listed in Fig. 34. These clearly date the burials as having been deposited early within the Birnirk Period. The other artifacts conform to the styles of this period, and almost exact duplicates of each were obtained at the Birnirk Site.

HOPSON'S WORK AT NUNAVAK

Hopson began working at Kugusugaruk, but, finding that Van Valin had cleaned up all the burial knolls, he soon moved to Nunavak (Fig. 5) where he opened five graves atop small knolls: one contained two bodies; the remainder, one each. In a letter dated July 25, 1929, Hopson describes his finds at Nunavak as follows:

These that I have excavated have the bodies laying with the heads all pointing S.E. and each one is wrapped in either Polar Bear skins or muskox skins, and each man or person had implements of hunting or household buried with them. In no case had anything been buried with the bodies that had not been broken. Each body had placed near the head a small whalebone container [baleen bucket] and a drinking tube made from wood. Each body had also near the head a platter made from clay, in taking them out and exposing them to the air they crumbled away so that it was almost impossible to save them. I did manage to save several pieces large enough to show what they were made of [several sherds with concentric circle paddle impressions]. . . . The best preserved specimen was wrapped first in a deer skin, then outside of that a polar bear. On the outside of this was a bearded seal skin with the hair on the skin. . . . The bodies were all lying on drift wood planks that had been chopped down on the upper side. A few were laid on driftwood logs that had never been worked. In some cases small willow brush had been placed under the bodies on top of the planks. . . . Each body was by itself with a small upright post each side of it at the head and foot, leaving a space of about four feet, and in between these posts each person and his implements were placed.

The same thing was done in the large mound opened by Van Valin only he had not gone to the bottom of the grave and the wood that the bodies he found rested upon is still in place.

Hopson's description is corroborated by Van Valin's drawings (Figs. 2 and 3) which show

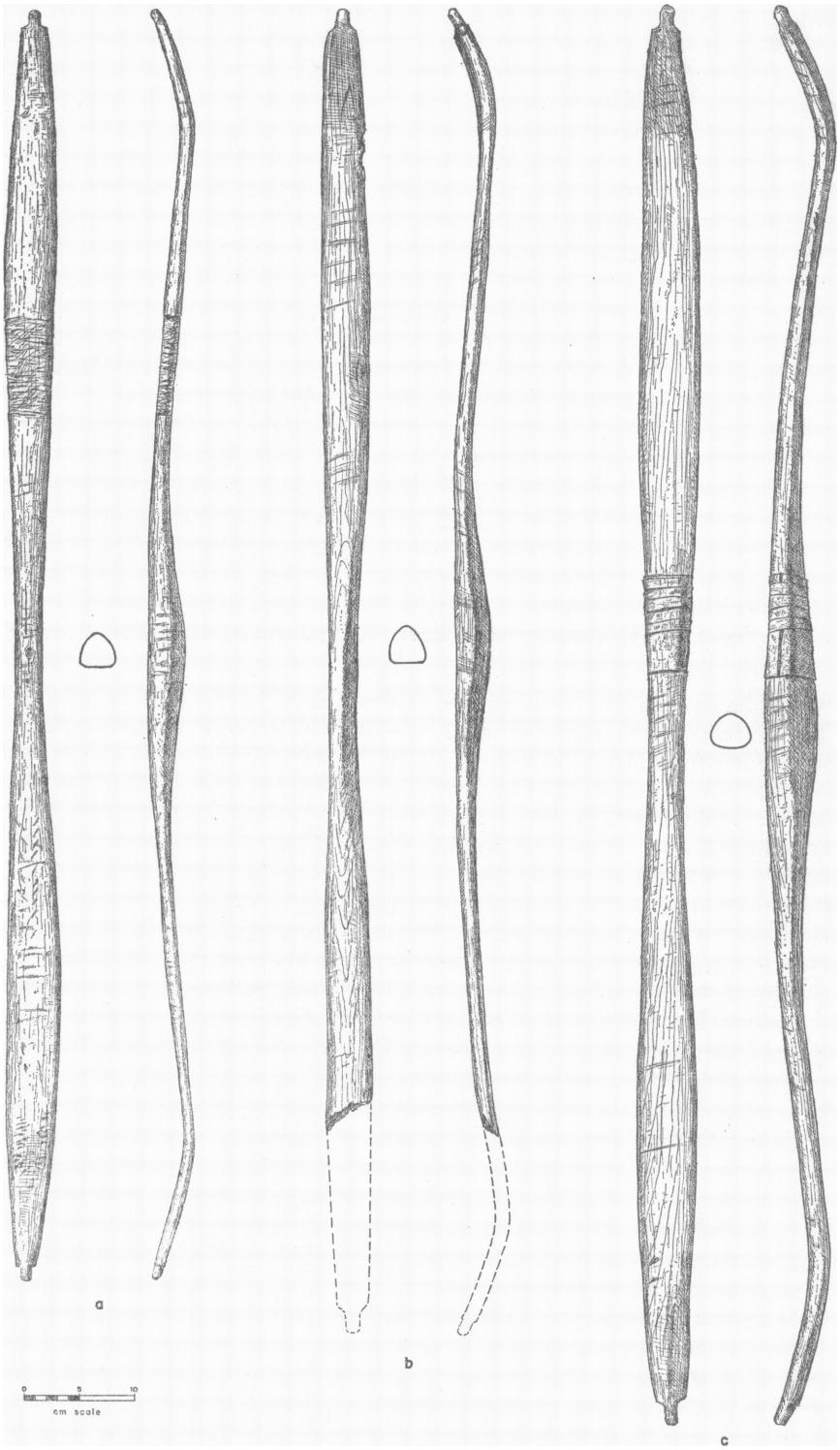


FIG. 4. Wooden bows secured by Van Valin at the Kugusugaruk burial site.

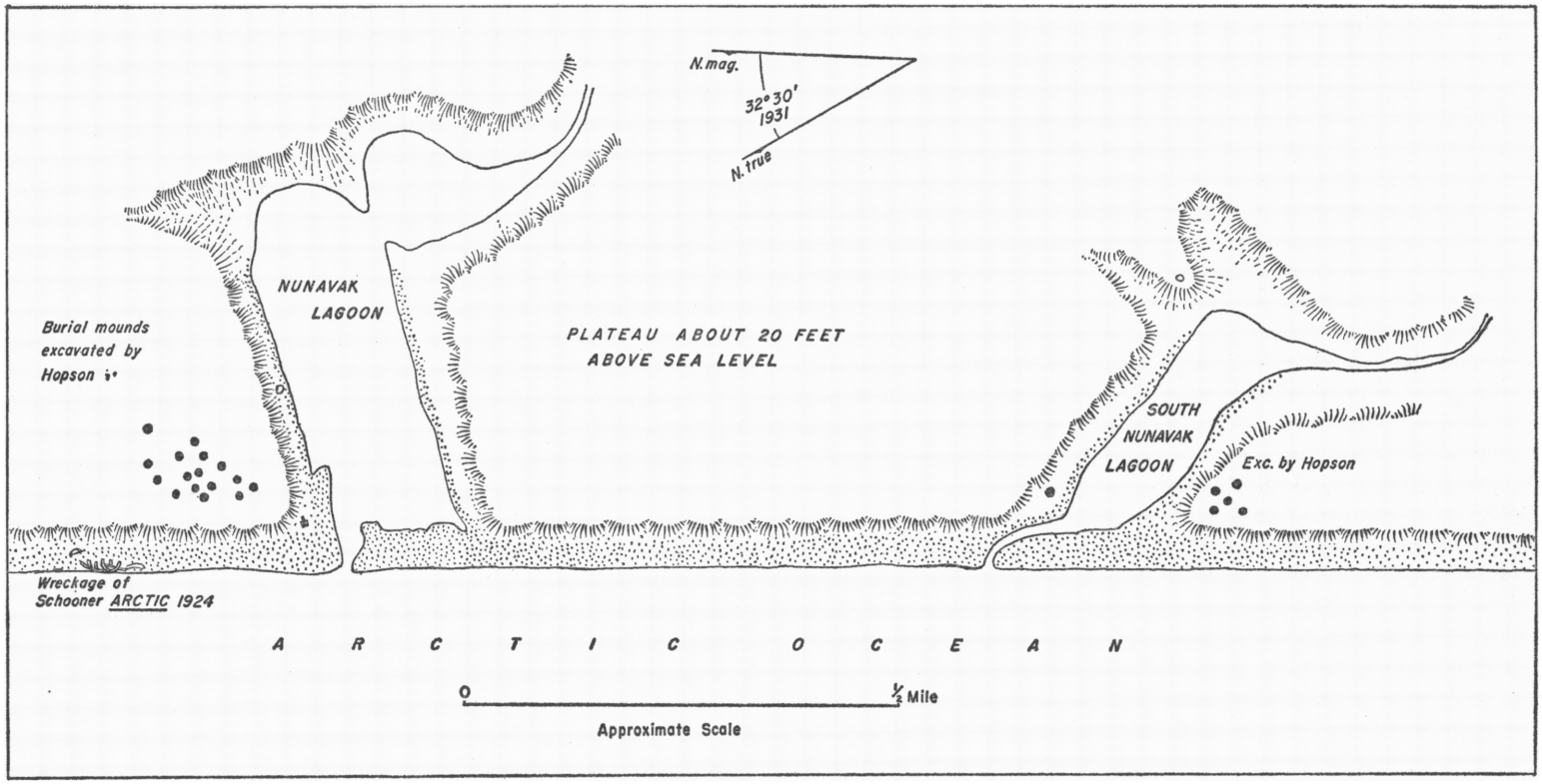


FIG. 5. Map of the north and south Nunavak lagoons. Small circles indicate the position of the natural hummocks in which shallow burials were opened by A. H. Hopson.

skeletons laid out on wooden platforms. There seems, then, to be a basic similarity in the method of burial in the Kugusugaruk Site excavated by Van Valin, the Nunavak Site where Hopson principally worked, and the Kugok Site which is described below.

Only a few specimens accompanied the six skeletons recovered by Hopson, mainly baleen buckets, slate ulus, and other items that serve to date the burials as on the general Birnirk time level, but do not permit precise dating such as is provided by harpoon heads. With Burial 6 was an ivory pottery paddle with concentric ridges on the face, almost identical to the paddle from the Kugok Site described below (Fig. 9q).[1]

[1] This paddle was illustrated in the University Museum Bulletin, University of Pennsylvania (1930, Vol. 1, No. 3, Pl. 6). The mistaken identification as a "blubber pounder" was made originally by Hopson.

EXCAVATIONS FOR THE UNITED STATES NATIONAL MUSEUM

KUGOK SITE

In 1932 Fred Hopson pointed out to me the location of a third group of burial mounds on the banks of a small gulley called Kugok that runs inland from the beach through the village of Utkiavik. About 500 feet in from the beach are five small knolls on the level tundra to the north of the drainage way, and on the opposite side there are two (Fig. 6). These rounded rises are only 2 to 3 feet high and perhaps 60 feet in diameter and are identical with hundreds of others that flank the drainage ways in the tundra. There seems to be little doubt that they are of natural origin. My excavations produced no suggestion that they were artificial constructions.

Test pits were made in all these low rises. The upper levels of all of them, except Mounds A and B, had been disturbed to a depth of 18 inches or 2 feet. Fragments of decayed wood and bone were found, but no artifacts. Mounds A and B contained burials, some of which apparently had been only partially disturbed.

Burial Mound A

A heavy sod of grass and moss covered the small rise designated as Mound A. Immediately below this sod, not more than 6 inches beneath the surface, burials and fragments of wooden platforms were uncovered. Both skeletons and the wood upon which they lay were principally within the zone of summer thaw. Consequently, the bones were extremely fragile, and the wood had been reduced to the consistency of wet paper and was crushed flat. It was impossible to tell whether the timbers had been hewn planks or were driftwood logs in the round. Grass roots had thoroughly penetrated the bones, wood, and artifacts and added considerably to the difficulty of clearing the site.

The arrangement of the burials in Mound A is shown in Fig. 7 and in Pl. 6a.

Burial 1 was an isolated skullcap unaccompanied by other bones. It lay in the soil, just off the edge of a wooden platform. Nearby was a small mattock made of whale rib (Find 1) which may or may not have been intended as part of the grave goods.

Burial 2, again, was merely a fragment of a skull. It lay near the center of a platform formed of five parallel logs. Nearby were a few fragments of plain pottery (Find 2). To the east of the platform was a large fragment of musk-ox hide.

Burial 3 was also a fragmentary skull. It lay on a platform of parallel logs, almost at right angles to the logs, under Burial 2. At the edge of the platform near the skull were a dozen sherds stamped with curvilinear designs (Find 3).

Burial 4, another single skull, lay on the ground to the east of Burial 2. Nearby was an oval baleen bucket with wood bottom and a cache of six large thin flint flakes that showed no sign of use. With these was an ivory mouthpiece for a sealskin float (Find 5; Fig. 9p). Find 6 lay 2 feet to the east, a slate ulu blade with shoulders like blades described below from Birnirk, and an elongated beach pebble with a groove knocked into one end.

Burial 5 was an adult skeleton that lay on its back, with the legs partially flexed, towards the northwestern side of the excavation. Timbers lay nearby, and several large whale ribs were over and above the head of the skeleton. Beneath the burial were fragments of musk-ox hide, and beneath these fragments of sealskin.

Find 14 was beneath the knees of Burial 5. It was an ivory pottery paddle with incised concentric circles on the flat sides (Fig. 9q). The design corresponds to the stamped pottery found with Burial 3 in this mound and at the Birnirk Site. This paddle is very similar to that found by Hopson at Nunavak which is mentioned above (p. 24). Associated with this was a rather well-preserved harpoon head made of antler of the Naulock Type (Fig. 9f).

Burial 6 was extended on the back on a platform of parallel logs. Underneath these, two logs lay crosswise. One humerus could be traced; the other probably had been lost through decay. Although in very poor condition, the other bones of the skeleton were in anatomical arrangement. Find 9, between the knees of Burial 6, consisted of two ivory hooks, unfortunately in rather advanced stages of de-

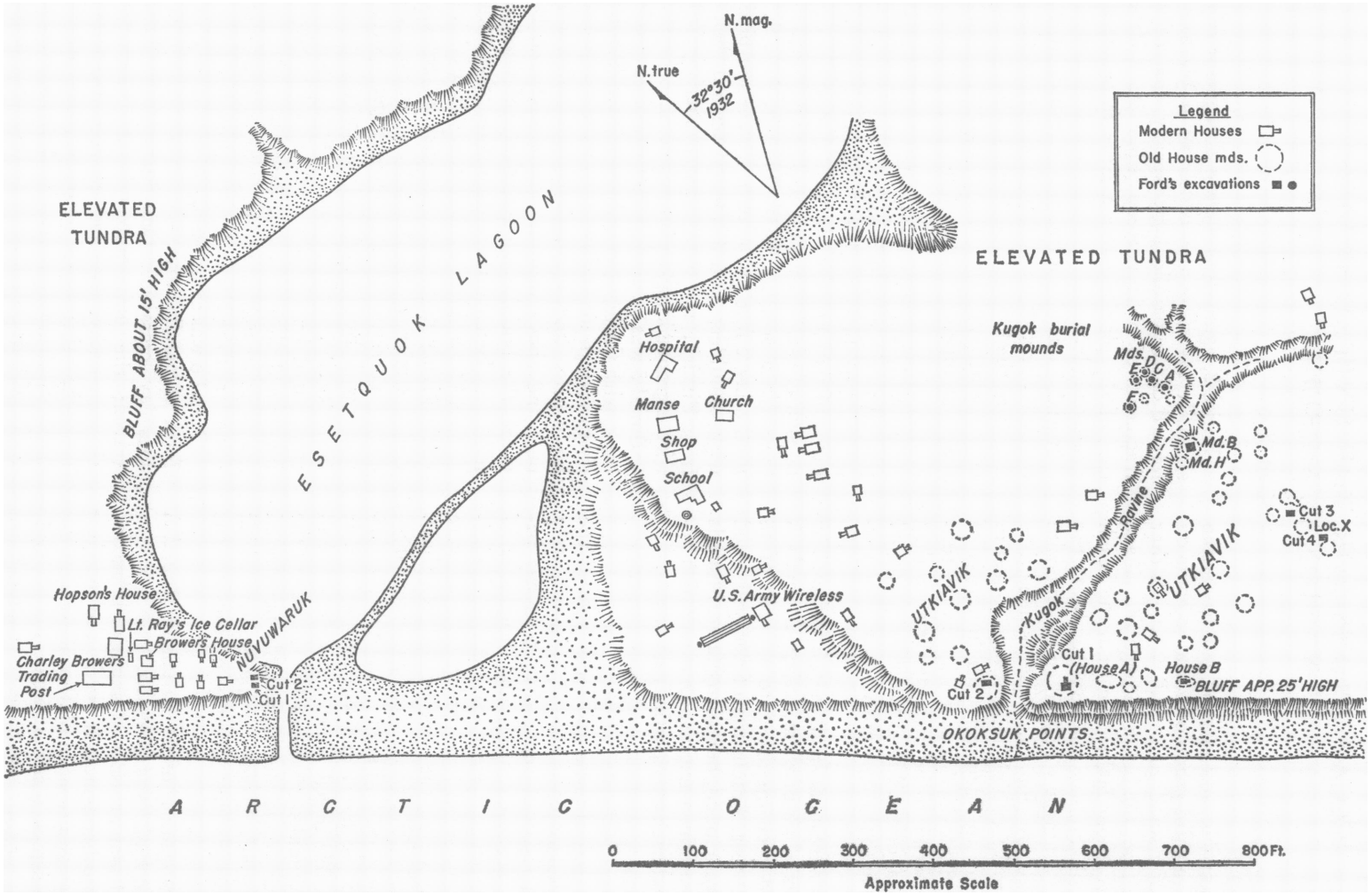


FIG. 6. Sketch map of Barrow Village as it was arranged in 1932. Brower's trading post was on the site of Ray's fort; nearby were the Nuvuwaruk ruins. Both occupied and abandoned houses were scattered through the Utkiavik Village. Black rectangles locate the cuts made there. The Kugok burial site and areas excavated are also shown.

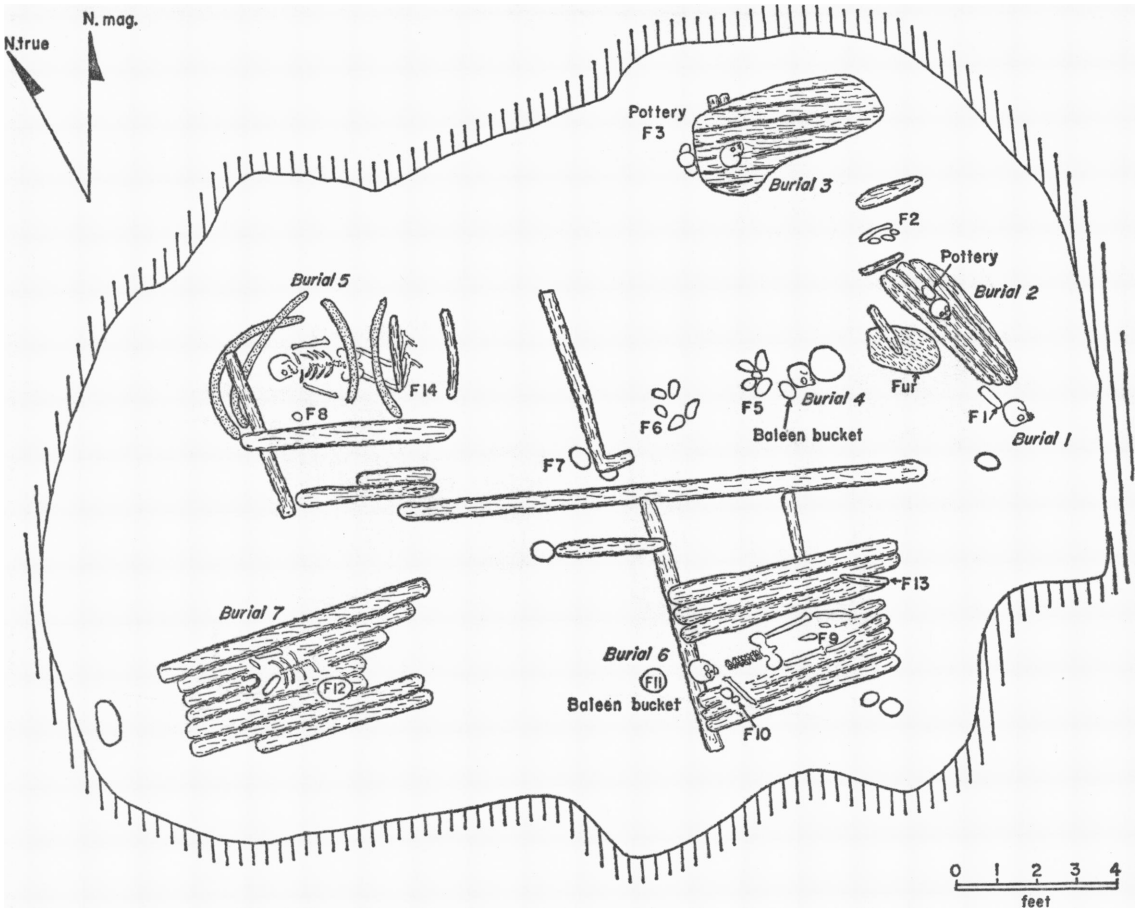


FIG. 7. Map of burials and finds in Kugok Mound A. Logs are shaded by lines; whale bones are stippled. (See Pl. 6a.)

cay, but on the small remaining portion of the cortex of each there were fragments of a fine-line incised decoration, plainly of Old Bering Sea style (Fig. 10a–b). This decoration is of the curvilinear variety that marks the latter phases of this style.

Find 10, at the right shoulder of the skeleton, consisted of two curious wedge-shaped pieces of ivory with sockets in the flattened end that contained fragments of decayed wood (Fig. 10c). The use of these items remained a mystery until I examined the collection from Birnirk made by Wilbert Carter and his associates for the Peabody Museum, Harvard. In this collection there is a complete wooden umiak paddle that has an identical ivory wedge fitted to the end of the blade. The utility of such a tip when working a canoe through floating ice is obvious, and it is strange that the Eskimo later abandoned this practical device. Find 11, an oval baleen bucket, lay just above the head of Burial 6, off the edge of the platform. Find 13, an ivory foreshaft for the harpoon, lay on the platform to the east of the feet of the skeleton (Fig. 9r). Two harpoon heads, very poorly preserved, also lay on this platform. One was of Naulock Type and the other conformed to the Tuquok category (Fig. 9a, e).

Burial 7 lay on a bed of parallel logs near the western end of the excavation. The lower jaw, clavicles, one humerus, and a few ribs were the only remaining bones, but they suggest that at least the upper part of the body had been extended on the back. Off the platform, above where the skull of the burial should have been, were fragments of plain pottery. On the logs to the right of the pelvis the remains of an oval baleen bucket were found (Find 12).

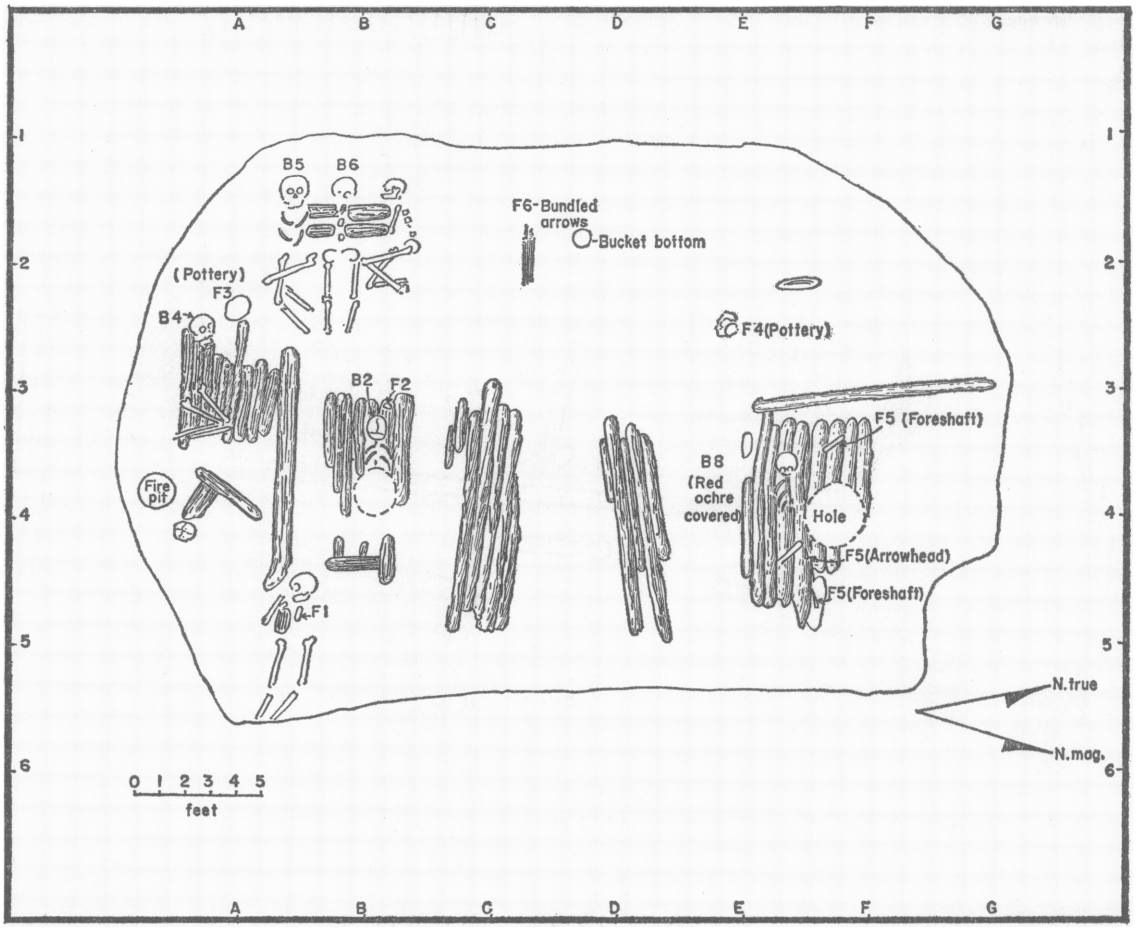


FIG. 8. Map of burials and accompanying artifacts in Kugok Mound B. (See Pl. 6b.)

BURIAL MOUND B

This small rise was situated across the ravine, southwestward from Mound A. Burials resting on platforms were found in it, very similar to those in Mound A (Fig. 8; Pl. 6b). A roughly rectangular area, approximately 35 by 22 feet, was uncovered to a depth of not over 1 foot, for none of the remains lay more than 6 to 9 inches beneath the present surface.

Burial 1, in the southeastern corner of the cut, was not on a wooden platform but lay on an uguruk skin and fragments of other unidentifiable skins. It was on its back, with legs slightly flexed. At the sternum there was a nicely chipped blade of translucent chalcedony, 11.5 cm. long, and a small, chipped, triangular point of the same material, 3.5 cm. long (Fig. 9i, k).

Burial 2 lay on a platform of parallel logs and was covered by other logs. It was partially destroyed by a hole that had been dug through the abdomen and pelvic region, cutting through both skeleton and log platform. The remaining upper part of the skeleton suggested that the burial had been extended on the back. Above the skull, on the edge of the platform, were fragments of a baleen bucket.

Burial 3 consisted of a single skull lying among some fragments of timber. Scattered about were two fragments of chalcedony, also chipped blades, of the same material and similar in shape to the large one found with Burial 2. There was also a rim fragment of a bowl-shaped pottery lamp. Immediately to the west, a shallow hole had been dug and a fire built in it. It could not be determined whether this was associated with the burial.

Burial 4 lay on its back, with legs flexed, on a

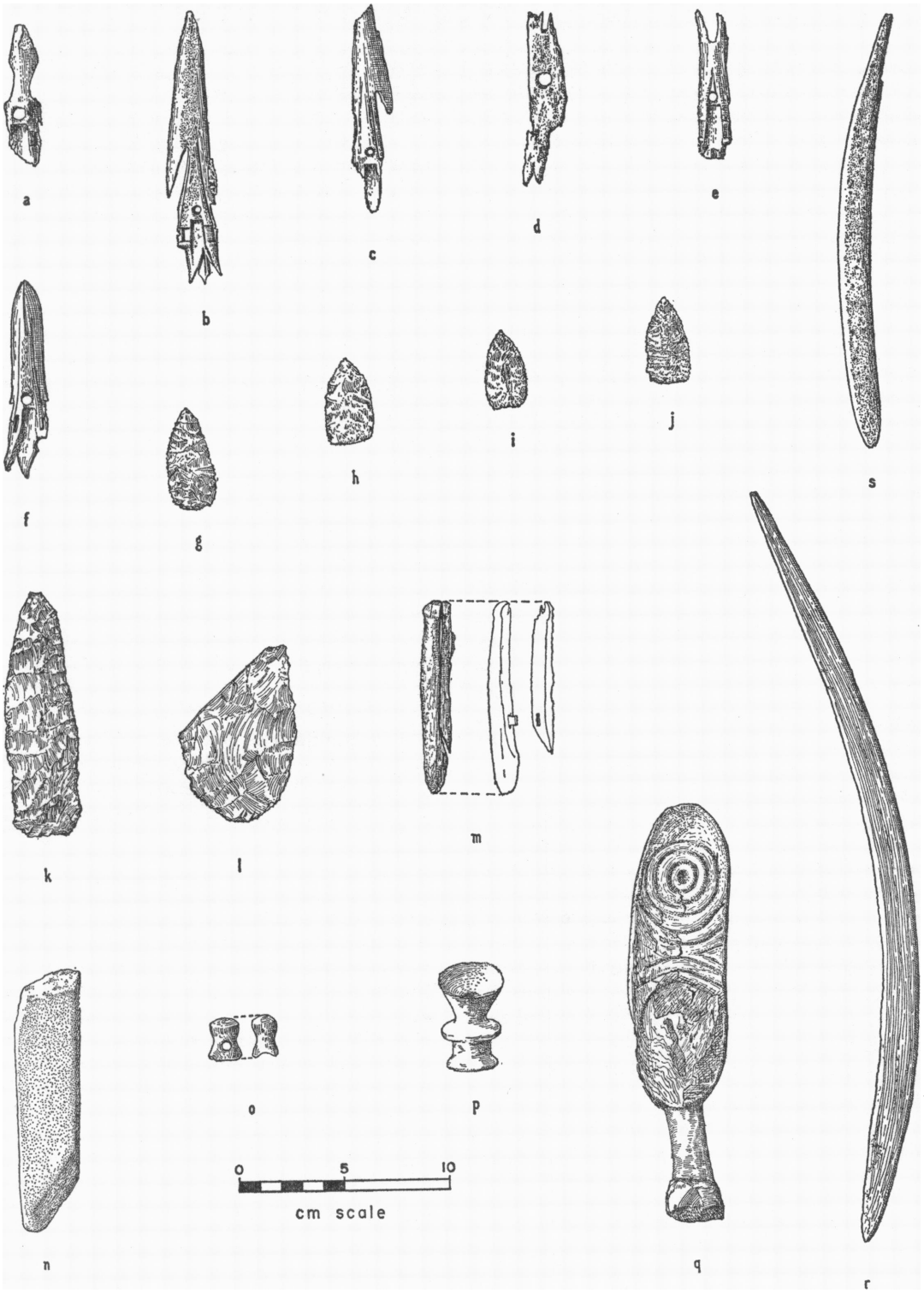


FIG. 9. Artifacts accompanying burials in Kugok Mounds A and B. a–f. Harpoon heads. g–l. Chipped flint knife blades. m. Composite handle for splitting knife. n. Whetstone. o. Finger rest for harpoon shaft. p. Inflation nozzle for sealskin float. q. Pottery paddle. r–s. Harpoon foreshafts.

pallet of parallel logs. At one side of the skull were about a dozen potsherds, fragments of a shallow rounded bowl too deep to have been a lamp and too shallow to be called a pot. The pieces could not be fitted together, so the exact shape of the bottom must remain uncertain. Apparently it was slightly pointed. Near this, at the edge of the platform, lay a whetstone of fine-grained sandstone. This had been used until it was square in cross-section, about 3 cm. on a side, and it was 11 cm. long (Fig. 9n).

Burials 5, 6, and 7 were found side by side in the southwestern corner of the excavation. Burial 5 lay on the back, with the knees slightly drawn up; Burial 6 was extended full length on the back; and Burial 7 lay on the right side, with legs flexed. A large wooden food dish, the only accompanying artifact, lay over the chests of Burials 5 and 6.

Five feet to the north of Burial 7 was a bundle of 11 arrows (Find 6). The heads and fragments of the shafts are illustrated in Fig. 61a–f. The shafts, about 40 cm. long, were round in section, except towards the nock where they were flattened. The diameter of the shafts increased slightly towards the point end. These arrows may have been in a quiver, but, if so, no evidence of it was found. Nearby lay the wooden bottom for a baleen bucket.

On the east side of the excavated area, opposite Find 6, were two arrangements of logs side by side. However, no burials or artifacts rested on them (Fig. 8). These, with the absence of any burial near Find 6, the occasional holes in platforms and burials, and the partially disturbed condition of some of the burials, add to the suspicion that both Mounds A and B had been partially excavated in a rather unsystematic fashion. The shallowness of the burials and the consistent color of the soil have probably caused other previous pits in these mounds to remain undetected.

Burial 8 lay on a rather extensive wooden platform at the northern end of the cut. For the first time it was possible to determine the form of the wood that underlay the interments. These were planks hewn to a thickness of about 2 inches. The skull and the ribs were disposed in such a fashion as to suggest that the burial was extended on the back, but the other bones were missing. Red ocher was scattered around the chest. A recent hole had been dug through the platform, just to the north of where the pelvis should have been. On the platform, just south of the skeleton, three rather poorly preserved harpoon heads were found. Two were of the Birnirk Type, and one was of the Naulock Type (Fig. 9c–d). Nearby were two arrowheads. A simple, ivory harpoon foreshaft (Fig. 9s) lay above the skull, and an ivory finger rest for the harpoon shaft (Fig. 9o) was found on the edge of the recent excavation mentioned above. Under the shoulders were three small triangular blades, neatly chipped, of the same translucent chalcedony mentioned above (Fig. 9g–h, j). Near the eastern edge of the platform was a composite knife handle, also of ivory (Fig. 9m). Its condition suggested that it belonged with this burial rather than with the recent material that was recovered in the overlying soil.

Tests in Burial Mounds C to F

As said above, Mounds C to F (Fig. 6) were examined by test trenches, but found to have been completely excavated to a depth of not over 18 inches, usually only 10 to 12 inches. A single artifact was recovered from Mound F, a badly eroded piece of ivory (Fig. 10d).

Comparison of Mounds A and B

The similarities of the constructions in Mounds A and B are readily apparent. Both contained wooden platforms, only 6 to 9 inches below the surface, on which skeletons were generally extended, with heads to the east. This recalls Hopson's statement that at Nunavak the burials had their heads to the southeast. They were accompanied by a small quantity of burial goods. Previous excavators may have removed part of the contents of these two mounds. The layer of sod and soil overlying the burials was light brownish and contrasted somewhat with the black soil immediately underlying the wooden platforms upon which the burials rested. In addition, this brownish layer was literally filled with chips of bone, an occasional bone sled shoe, and a few artifacts of types identical to those found in the recently abandoned houses of Utkiavik, some of which are not more than 100 feet away. This recent layer not only covered the tops of these low mounds but also the ground nearby. It extended down into the gulley that separates Mounds A and B and was thicker, up to 2 feet deep, in the floor of the drainage way. Not only typology, but preservation, distinguishes this bone and wood ma-

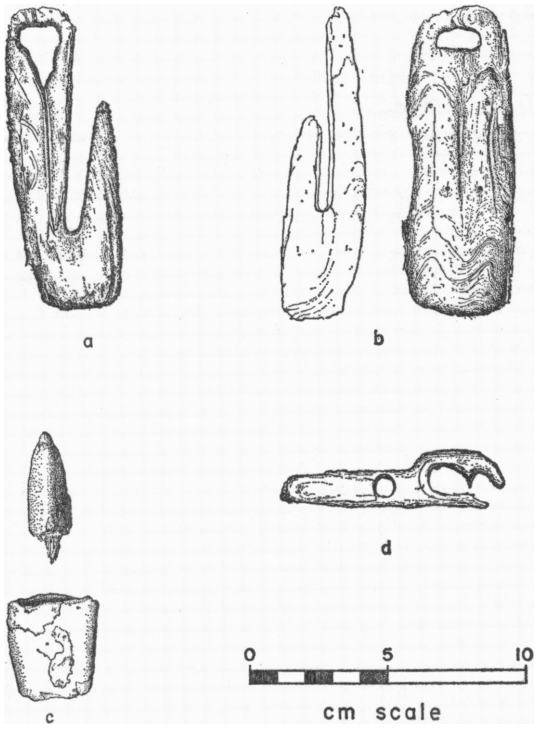


FIG. 10. Artifacts from Kugok Mounds A and F. The ivory hooks (a and b) are badly eroded, but light curving parallel lines on preserved portions of the cortex and drilled holes on b are the remains of Old Bering Sea style decoration. c. Two ivory paddle tips found with Burial 6, Mound A. d. Unidentified ivory object from Mound F, apparently an animal head.

terial from the artifacts accompanying the burials. As were artifacts recovered from all parts of Utkiavik, these chips and artifacts in the brownish soil were well preserved.

The fact that the few inches of soil covering these burials is of recent date suggests the possibility that when the burials were first placed on these two hillocks they were not covered. Possibly by the time of the occupation of the Utkiavik Site, they were sufficiently overgrown by moss, grass, and the wind-blown soil trapped by this vegetation to conceal the skeletons, so that the people of Utkiavik who used this area as an outdoor workshop were unaware that they were working over the graves of their ancestors.

Burials on log platforms, usually covered with logs in different ways, are not an uncommon Eskimo practice, even in recent times. In 1930 Henry Collins and I removed several skeletons from recent burials near Unalakleet. These had been laid out on platforms formed of parallel logs and covered by other logs placed over them tipi-fashion. At the Ipiutak Site at Point Hope, Larsen and Rainey found numerous Ipiutak and Near Ipiutak culture burials placed in rectangular log tombs, outlined by log frames, or on indistinguishable masses of rotted wood. So shallow were many of these burials that the excavators were uncertain that they had been intentionally covered with soil.[1]

CULTURAL CONTENT OF THE KUGOK BURIAL MOUNDS

The inventory of items from my excavations of the two burial mounds at the Kugok Site is by no means so extensive as the collections made by Van Valin and Hopson. Basically, this collection appears to be closely related to the cultural content of the Birnirk Site, described below. However, there are a few suggestions, based principally on decoration, that these burials may be slightly earlier than most of the material from Birnirk. Among these are the two ivory hooks (Fig. 10a–b) that bear the remnants of curvilinear Old Bering Sea style of decoration. The badly eroded ivory object shown in Fig. 10d appears to represent an animal with mouth open and teeth prominently featured. This is another motif of the Old Bering Sea style,[2] but the present example is too poorly preserved to show whether there was fine incised decoration on the modeled figure or not.

At the Kugusugaruk Site, Van Valin appears to have found a closed socket harpoon head with a simplified Old Bering Sea decoration of Style III.[3] This is the latest of the Old Bering Sea styles and is the one that can be expected as an occasional find in sites that date early in the Birnirk Period. Neither my work at Birnirk nor the recent, more extensive excavations of Wilbert Carter for Harvard University have uncovered any clearly recognizable Old Bering Sea style decorated artifacts from the Birnirk Site. In the Stefánsson Collection, reported by Wissler, there is a harpoon head of rather crude Old Bering Sea style of decoration, listed from

[1] Larsen and Rainey, 1948, 57–63.
[2] Collins, 1937, Pl. 27 B.
[3] Mason, 1930, Pl. 5, Fig. 1; cf. Collins, 1937, Pl. 26, Fig. 16.

Birnirk.[1] There is also an excellent example of an early Old Bering Sea Period harpoon, both in shape and decoration, shown as Wissler's Fig. 9. It conforms to Collins' Type Ix.[2] This is listed as from Utkiavik. Stefansson purchased the specimens in his collection from the Eskimo, and the report was probably correct. This harpoon head probably came from the Kugok mounds on the edge of Utkiavik Village.

The sites excavated by Van Valin, Hopson, and myself appear to give a very clear picture of the burial customs of the early part of the Birnirk Period. The bodies were wrapped in skins and placed upon wooden platforms more or less carefully prepared. Baleen buckets may have contained food and drink; weapons and tools were placed beside the bodies. Probably there was usually a covering of logs which, because it was subject to thawing in the summer, has almost completely decayed.

Physiography Related to the Burial Sites

Figure 5 is a sketch map of the Nunavak vicinity, the lagoon of that name, and another lagoon about half a mile down the coast to the southwest which, for the sake of convenience, is herein referred to as "South" Nunavak Lagoon. As can be seen there are five small mounds to the south of the mouth of this southern lagoon. These were also excavated by Hopson, and he stated that they contained burials, but I obtained no clear account as to exactly what was found in them.

It appears that the knolls at Kugok, Nunavak, South Nunavak, and Kugusugaruk are all of natural origin. The method of formation is clearest in the case of the low mounds beside the two Nunavak lakes; they are obviously frost features, a result of the ground ice wedges so ably described by Leffingwell.[3] In the vicinity a number of young knolls, unused by the Eskimo for burial purposes, could be seen in the process of formation. As can be observed, many of the Nunavak mounds lie at the intersection of ground ice cracks, particularly where cracks intersect in the form of a T. At these intersections there is often a small pond. The mounds are found just above the stem of the T, adjacent to what may be considered the crossbar. The sides of what appear to be fresh mounds are steeper towards the ice crack and slope more gently on the other sides. The turf on these young mounds is broken into blocks, more or less evenly spaced over the hillocks, and the subsoil can be seen through the wide cracks between the turf blocks. This suggests that these hillocks were raised by pressure from below the surface. Apparently older mounds are evenly covered with sod, but this coverage seems to be by a slow process. The force that has raised these mounds is probably provided by the longitudinal expansion of the ice wedges that occupy the stem portions of these T-like intersections. The ancient Eskimo merely took advantage of these knolls as resting places for their dead.

As far as I could discover, the rather extensive excavations of the Eskimo, who have been mining the abandoned portions of Utkiavik for specimens for a number of years, have not located any area with dwelling refuse of an age comparable with the burials at the Kugok mounds. A similar situation appears to exist at Nunavak and at South Nunavak; we found no dwelling site refuse, although we searched the vicinity with great care, digging a number of holes in the tundra at likely places.

Usually Eskimo burials are placed back on the tundra away from the shore, only a short distance from the dwellings. The lack of any evidence of dwellings in the vicinity of these sites is somewhat strange and requires some attempt at explanation. The 25-foot cliff at the village of Utkiavik is still retreating, as is demonstrated yearly by fresh slumping of the bank. It has been argued that this results from a sinking of the coast line so that possibly the dwellings of a date comparable with the burials described have already eroded into the ocean. The conditions at Nunavak lagoons are slightly different in that the banks are low, and probably the coast is not retreating as fast as at Utkiavik. There is a possibility that village site remains have been lowered by regional subsidence beneath the water of the drowned river mouths or the sand beach formation that separates these lakes from the ocean. It would be interesting to do some test drilling in the areas in an attempt to find refuse deposits.

[1] Wissler, 1916, Fig. 6a.
[2] Collins, 1937, 100–101, Pl. 23, Fig. 1.
[3] Leffingwell, 1919, 205–242.

BIRNIRK SITE

The ruins at the old site, called Birnirk in recent literature, were first mentioned by Lieutenant Patrick Henry Ray and Sergeant John Murdoch in their reports on the work of the Point Barrow expedition conducted by the United States Army in 1881–1883. On maps and in the text the name was spelled in various ways.[1] The current spelling of the name derives from Stefánsson who arranged to have Eskimos dig at this locality and purchased the antiquities recovered. This collection is in the American Museum of Natural History, and the harpoon heads and dart points in it were described by Wissler in 1916.[2] Admittedly, Eskimo names are usually difficult to represent in English orthography, but all the variations seem rather poor approximations of the name that the present inhabitants of Barrow apply to this ruin. A closer approximation would be "Piġ-i-nik." However, I have no desire to offer still another spelling for the name of this site and continue to use Stefánsson's name "Birnirk," as this is the form that has been used most often in publications dealing with Eskimo archeology.

The Birnirk Site is located near the beach, approximately midway between the village of Barrow and the Point, at the southern end of the sand spit that separates Elson Lagoon from the Arctic Ocean (Fig. 1). This spit is only about 400 yards wide, and there is easy access to both bodies of water. Today, as in the past, it is an excellent place to shoot eider ducks. The migrating birds follow the coast and cross over the spit from the Arctic Ocean to Elson Lagoon at this place. Ray's brief description is worth repeating:

> . . . also at Perigniak a group of mounds mark the site of an ancient village. It stands in the midst of a marsh; a sinking of the land causing it to be flooded and consequently abandoned, as it is their custom to select the high and dry points of land along the sea-shore for their permanent villages.[3]

As is shown below, Ray's interpretation appears to be correct; there has been a change in relative elevation of sea and land since the Birnirk Site was settled.

A 1-foot-interval contour map of the Birnirk Site, made in 1953, is given as Fig. 11. An official Coast and Geodetic Survey sea level has not been established for the Point Barrow Area, and the datum used for this plot was obtained by the very casual process of sending the rodman down to the edge of the water. However, the base elevation is very likely rather close to mean sea level as it will be determined, for the tide range at Barrow is only 6 to 7 inches.[4] Storm tides sometimes cause the Arctic Ocean to rise several feet along this coast, but the observation used in making the map (Fig. 11) was taken during a period of calm weather when sea level appeared to be normal.

The Birnirk Site is marked by 16 well-defined mounds, ranging from 2 to 10 feet in height. These mounds tended to be more or less round or oval in groundplan, 50 to 120 feet in diameter, and were approximately dome-shaped. The surfaces were very irregular and were pitted with depressions marking old houses and meat cellars. Casual inspection suggested that these mounds resulted from repeated construction of sod-covered houses on the ruins of older structures. Excavation demonstrated the correctness of this assumption.

The mounds at Birnirk were arranged roughly in three rows parallel to the beach of the Arctic Ocean. The present ground surface around them is typical wet tundra, interlaced with ice cracks forming polygonal structures and dotted with small shallow pools of water. The ice cracks show plainly in the air photograph of the site (Pl. 1). On the map (Fig. 11) these cracks have been indicated principally where they cross the mounds.

At present the tundra surrounding the Birnirk mounds lies from 1 to 6 feet above sea level. However, excavation has demonstrated that the mounds were not accumulated on this tundra surface. They rested on coarse clean sand mixed with small gravel, the same material that forms the present beach of the Arctic Ocean opposite the site. This surface is from 1 foot to 18 inches beneath the surface of

[1] Ray, 1885, "Perignax," map opposite 28; "Perigniak," 24; "Pergniak," 118.

[2] Wissler, 1916.

[3] Ray, 1885, 37.

[4] Ray, 1885, 678.

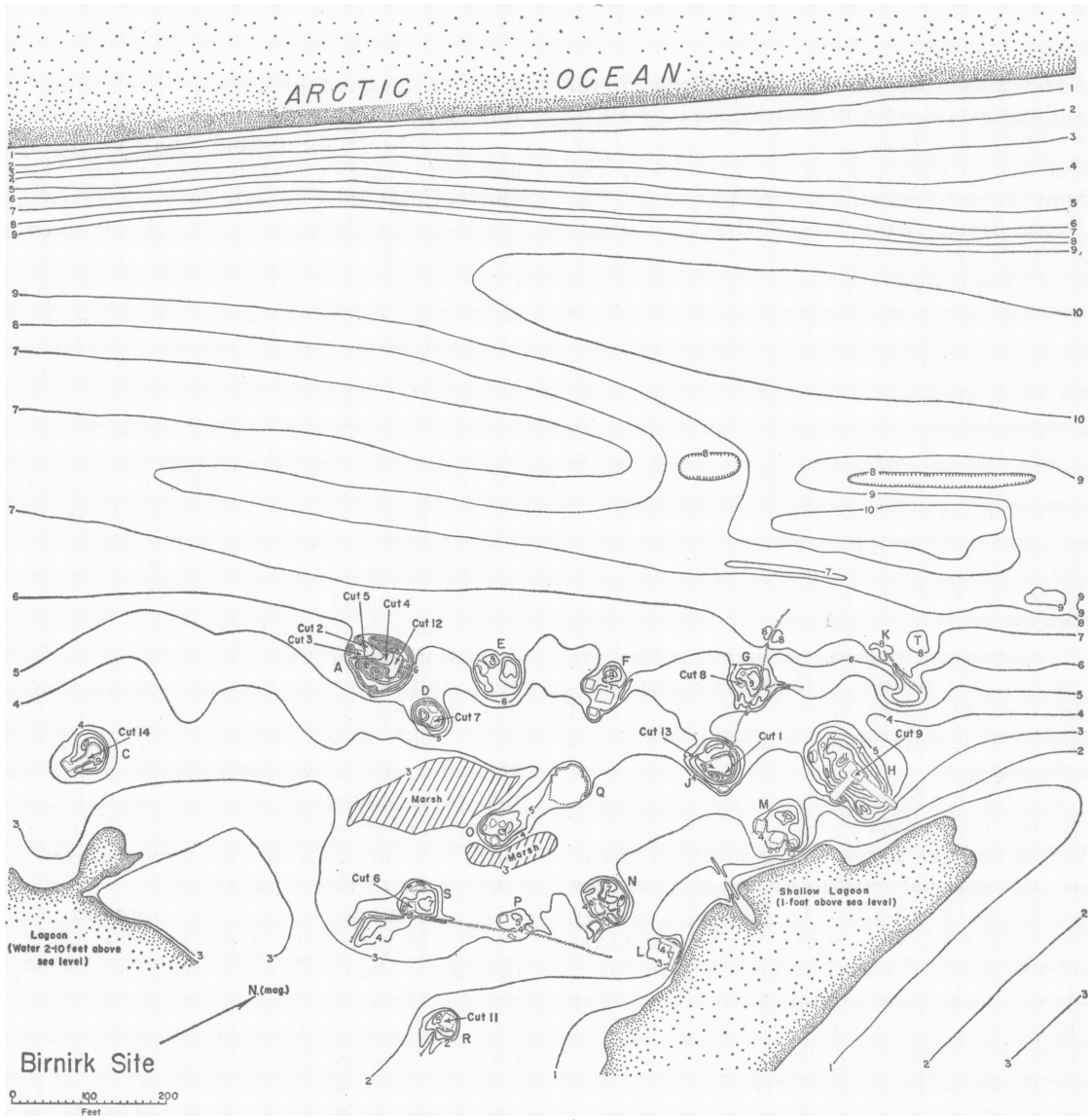


FIG. 11. Contour map of the Birnirk Site made in 1953. Excavated areas are enclosed by dotted lines. In 1932 and 1936 Ford made cuts in Mounds A, C, D, G, J, R, and S. The Harvard University party, directed by Wilbert Carter in 1951, 1952, and 1953, excavated Mounds H, I, K, L, M, and Q.

the tundra. Actually, then, the Birnirk Site is on a surface that is elevated only a few inches to 5 feet above the level of the sea.

As Ray said, this is not the sort of locality that Eskimo usually choose as sites for their village. In fact, the old beach surface upon which the mounds rest demonstrates that the ancient Eskimo did not build their houses in a tundra marsh. There is clear evidence that the entire northwestern coast has subsided about 5 feet since the period of the Birnirk Culture phase. This subsidence is probably continuing today. Because it has affected other prehistoric sites along this north coast, the subject is worthy of extended consideration here.

EVIDENCE FOR SUBSIDENCE IN THE VICINITY OF POINT BARROW

Figure 12 is a south to north cross-section of the Birnirk Site made from the information pre-

sented in the site map (Fig. 11). This section runs at right angles to the Arctic Ocean beach and cuts across Mounds D, S, and R. The vertical scale is exaggerated 10 times, as will be noted by comparing vertical and horizontal scales. As this section shows, the coast here has at least three parallel beach lines. The air photograph (Pl. 1) suggests the possibility that a fourth beach line may be involved. This is indicated by the long narrow slough that lies parallel to the beach line adjacent to Mound B.

The crest of the present beach, rising from 9 to 10 feet above sea level, has been built by the southwesterly storms that occur in September and October when the main ice pack has withdrawn, leaving this coast open. A practical demonstration was offered in 1936 when I had a camp on this beach crest, the highest ground in the vicinity except for the Birnirk mounds. I went to sleep one night with the pack ice in on the beach, barely loose enough to provide lanes through which one could travel in a skin boat. At midnight I was awakened by a wet sleeping bag. A strong southwest wind had cleared out the pack ice, raised the sea level substantially in a storm tide, and the wash from waves was pouring over the beach crest at many points. My umiak, which had been left halfway between the tent and the edge of the water, had disappeared, and the outboard motor left with it was buried in the sand. Two days later we found the skins of the umiak up the coast towards Point Barrow; waves had beaten it against stranded ice cakes and broken out all the wooden framework.

From the map, air photograph, and profile of the Birnirk Site, it is apparent that these beach ridges have been constructed successively, from the south towards the north. The ridge crests increase in elevation in the same direction. If it is safe to assume that storm waves built the earlier beach crests to a similar height, then it is obvious that the land has been slowly sinking while this series of ridges was in process of construction. The Birnirk Site was probably settled while some part of the middle complex of beach (Fig. 12) was the active beach. Abandonment of this locality as a permanent village may well have been caused by the lowering of the land in relation to the sea and the consequent invasion of wet tundra.

The air photograph (Pl. 1) shows that the present active beach ridge forms the body of the sand spit that extends 5 miles to the northeast to the present Point Barrow. If Birnirk was settled before this ridge was constructed, as the evidence suggests, it was situated at the then northernmost point of the North American continent, a geographical distinction which would titivate a modern chamber of commerce, but meant nothing to this small village of Eskimo. The strong northwesterly current that runs along this coast explains how the later spit extending to the present Point Barrow was built. Evidence of its progression is provided by a small curving spit that extends eastward into Elson Lagoon, a short distance north of Birnirk. Appropriately named Nixeruk (hook, little) by the Eskimo, this hook-shaped spit marks a former position where the northern terminus of the coast line was stabilized for a time.

Aside from the above-described situation at the Birnirk Site, there is considerable additional evidence that the region near Point Barrow has subsided in relation to sea level in recent times and is still continuing to sink slowly. For example, both the northern and western coasts of the northward-sloping coastal plain that lies north of the Endicott Mountains are being actively eroded by summer storms. Locally, the prevailing coastwise currents are depositing sand and finer materials at many places, thus building barrier sand spits, islands, and under-

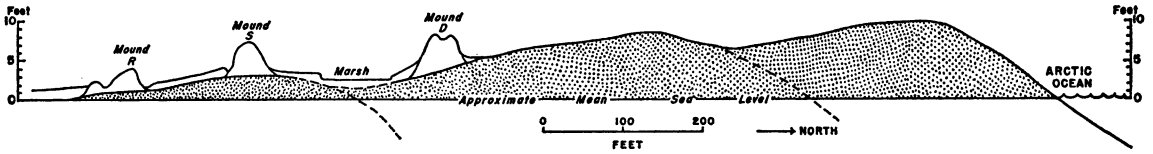


FIG. 12. South to north cross-section of the Birnirk Site based on the contour map (Fig. 11). This section, through Mounds R, S, and D, shows the height above sea level of the present sand beach crest and the heights of the two older beaches upon which the Birnirk mounds were accumulated.

water bars. But along most of the coast from Point Lay, at least as far east as Barter Island, on stretches of unprotected coast, there are active-wave-cut bluffs immediately behind the low sand beaches. Each year great blocks of frozen soil and ground ice are undercut and slump from the face of these bluffs. Where the bluffs are over 20 feet high, the erosion is progressing so rapidly that the buried clear ground ice is exposed; the cessation of cutting action for only a few summers would allow this exposed ice to melt, and the overlying tundra surface would slump down and hide these exposures. Leffingwell, in his excellent study of the Beaufort Sea coast east of Point Barrow, was aware that in some localities he was studying a retreating coast line.[1] Some of his photographs are excellent illustrations of a typical phenomenon observable along the coast line east and west of Point Barrow.[2]

With very few exceptions the streams that flow into the ocean along this coast have drowned mouths. The small stream at Barrow, the two streams at Nunavak 6 miles to the southwest, and the mouth of the larger Kuk River at Wainwright are typical examples. The drowned mouth of the Kuk forms Wainwright Inlet and provides good shelter for launches and small boats.

The lower valleys of the smaller streams are occupied by triangular lakes that extend inland 1 to 3 miles from the beach. These peculiar lakes warrant a brief description. During the greater part of the year they are cut off from the ocean by sand-beach ridges built across the mouths of the valleys by the autumn storms. The lakes are shallow. As do the streams that feed them, they freeze solid during the winter. In the spring, when the snow melts, quantities of water flow down these valleys and fill the lakes to the top of the beach barrier built by the sea the previous fall. Finding a low place in the beach a channel is cut through to the sea, not necessarily in the same place each year. When the lakes first flood they seem to be ice free, but they are not; the ice is frozen to the bottom. In a few days the ice comes to the surface and once again one can walk across the lakes.

In the foregoing it is suggested that subsidence may explain the lack of evidence of dwelling sites related to the burials at Kugok, Nunavak, and Kugusugaruk. More archeological evidence of subsidence is found at the Nunagiak Site 75 miles down the coast from Barrow. There the remains of a Punuk Culture house are buried in a lagoon beach below sea level. This is described in detail below.

[1] Leffingwell, 1919, 170–171.
[2] Leffingwell, 1919, Pls. 26B, 31, 35A.

Excavations at the Birnirk Site

Inspection of the mounds at Birnirk suggested that there was little possibility of making stratigraphic excavations in accumulations of refuse, uncomplicated by houses and other structures. Such dumps are generally located on either side of house entrance tunnels and usually are the most prolific source of artifacts in old Eskimo sites. However, the modern Eskimo are as well aware of this fact as the archeologist, and, since Stefánsson gave an impetus to the industry in 1912, they have been mining the refuse dumps about the flanks of the Birnirk mounds for specimens. But the height of the mounds did promise the possibility that each one would contain a succession of houses, constructed in sequence, atop earlier dwellings. In general this proved to be the situation, but the untangling of the sequence of artifacts in such a succession is extremely difficult. Complicating factors are the utilization of earlier house pits for later structures, the robbing of timbers from earlier structures, with consequent overturning of the cultural deposits, and the inclusion of earlier specimens in the soil that was placed on the roof of later houses.

The total time spent working at Birnirk was rather brief: only four days in 1931; six weeks in 1932; and two weeks in 1936. From two to four Eskimo assisted me during most of this time. The mounds were composed of sod, silt, and cultural refuse; consequently, the rate of thaw was somewhat slower than that in old sites containing appreciable amounts of coarser sand and gravel. We usually had from six to eight excavations under way at the same time and every other day lowered each 2 to 3 inches, the depth of the thawed soil.

In 1932 I made a map of the mounds at Birnirk, using a hand compass, measuring distances by pacing. This provided a rather crude sketch map inaccurate in many details. In 1953 when I was again at Barrow as a guest of the Peabody Museum of Harvard University group, a plane table and alidade were available

at the Arctic Research Laboratory. I took advantage of these to make a 1-foot-interval contour map (Fig. 11). This shows my excavations of earlier years and the extensive excavations of the Harvard group made from 1950 to 1953. As can be seen, the original shape of several of the mounds had been altered considerably.

Mound A

Mound A, the highest and next to the largest mound in the Birnirk group, was roughly circular, somewhat dome-shaped, 80 feet in diameter at the base, and about 12 feet high. A shallow pit near the summit indicated the location of the latest house. The entrance tunnel of this house ran southwestward down the slope of the mound. On the mound flank, near the entrance to this tunnel, were two small areas where the ground surface was relatively undisturbed by previous digging. Two strata cuts were made here in the hope of cutting through refuse dumps from the latest as well as earlier houses (Fig. 13). Cut 2, measuring 10 by 12 feet, penetrated through 32 inches of refuse to clean beach sand at the base of Mound A. Incidentally, this cut demonstrated that the surface upon which the mound had been accumulated was about 18 inches beneath the surface of the moss-covered tundra that now surrounds the mound. Cut 3 was also a rectangular excavation, 10 by 12 feet. The material from it was collected in seven levels, to a depth of 34 inches. The contents of these two excavations are listed below.

Cut 2, Section 1

1 Naulock open socket harpoon head
1 Birnirk open socket harpoon head
2 slate blades for harpoon
1 lance blade, chipped
1 bolas ball
1 chipped knife blade, stemmed
1 slate knife blade, stemmed
5 plain sherds
5 ulu blade fragments
1 bear canine, grooved

Cut 2, Section 2

1 Birnirk open socket harpoon head
1 slate blade for harpoon
3 bolas balls
1 composite knife handle
1 slate knife blade, stemmed
1 bone spindle point for bowdrill
5 ulu blade fragments
1 drum handle

Cut 2, Section 3

1 Thule 2 open socket harpoon head
1 Tipiruk open socket harpoon head
1 bow fragment
2 bolas balls
4 lamp fragments, pottery
2 ulu slate blade fragments
1 beamer of deer metapodial
1 oval wood bucket bottom

Cut 2, Section 4

1 Naulock open socket harpoon head
1 Birnirk open socket harpoon head
1 arrowhead with multiple unilateral barbs, straight tang
1 slate blade for harpoon
1 ice pick for harpoon, Type A
1 bow fragment
7 arrow fragments
1 atlatl dart butt piece
1 fish spearpoint
4 bolas balls
1 bone spindle point for bowdrill
1 shovel, scapula
1 plain sherd
1 ulu slate blade fragment
1 beamer of deer metapodial
1 bear canine, grooved

Cut 2, Section 5

2 decorated sherds
2 plain sherds
1 beamer of deer metapodial
1 bone awl
3 pegs for staking hides
1 pin-and-cup game
1 baleen ring for walking staff
1 swivel, baleen
— bird snares, baleen
— knots, baleen

Cut 2, Section 6

1 chipped knife blade, stemmed
1 ulu slate blade fragment
1 baleen cross
— bird snares, baleen
— knots, baleen

Cut 3, Section 1

2 Natchuk open socket harpoon heads
1 Birnirk open socket harpoon head
1 slate blade for harpoon
1 side prong for bird dart, Type A

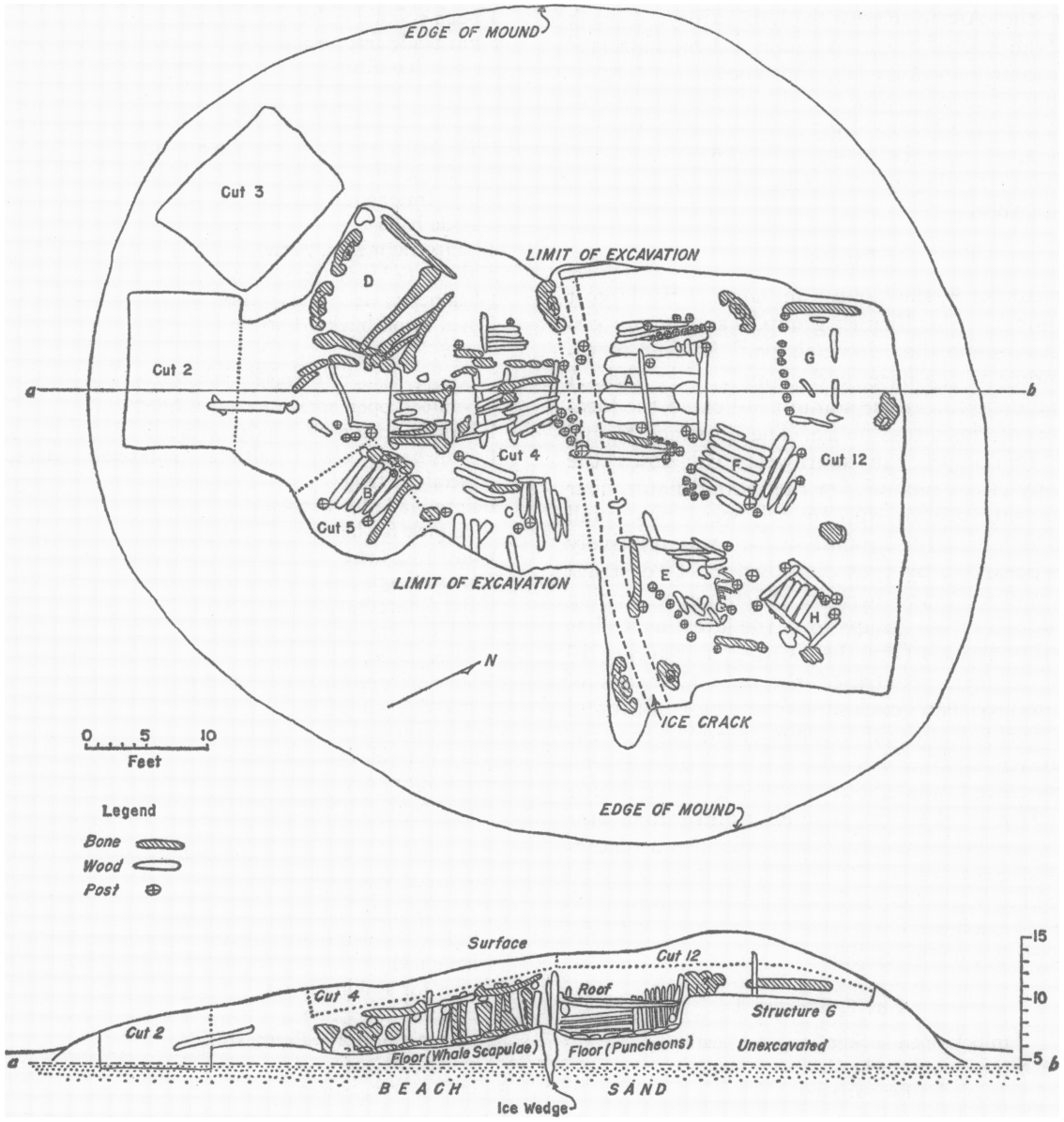


FIG. 13. Map and section of the excavations in Mound A, Birnirk. Cuts 2 and 3 were strata cuts intended to test refuse deposits. Cuts 4 and 12 were started to uncover structures in the top of the mound. Various structures are lettered A to H. Wooden timbers are unshaded; whale bones are shaded. (See also Pl. 5.)

2 crude bolas balls
2 slate knife blades, stemmed
1 bone wedge
2 lamp fragments, pottery
1 plain sherd
3 ulu slate blade fragments
1 endscraper blade
2 bone awls
1 inserted bird bone game
1 toggle, ornamental

CUT 3, SECTION 2

1 Tipiruk open socket harpoon head
1 arrowhead with multiple unilateral barbs, straight tang
1 hook for atlatl

1 bottom cross piece for umiak
1 fish spearpoint
2 composite engraving-knife handles
5 bone spindle points for bowdrill
4 lamp fragments, pottery
1 decorated sherd
3 ulu slate blade fragments
1 loon or duck sternum spoon
1 toy bow
1 toggle, ornamental

CUT 3, SECTION 3

1 Birnirk open socket harpoon head
1 atlatl dart butt piece
1 rib cut for bolas balls
2 bolas balls
1 composite engraving-knife handle
1 engraving tool
3 lamp fragments, pottery
4 ulu slate blade fragments
1 oval wood bucket bottom
1 scapula snow shovel
1 toy bow
3 toy arrows
3 bear canines, perforated

CUT 3, SECTION 4

1 plug for seal poke
1 kayak frame part
1 fish spearpoint
1 bolas ball
1 knife handle, blade slot in end
1 slate knife blade, stemmed
1 bowdrill
1 snowknife
1 adze handle
1 meat fork
1 shredded baleen insole
2 toy bull-roarers
1 bark doll
2 toy bows
1 baleen cross
— baleen bird snares

CUT 3, SECTION 5

1 bow splice reënforcement
1 bird dart side prong, Type B
1 wound plug
1 composite engraving knife
1 bone spindle point for bowdrill
5 lamp fragments, pottery
2 plain sherds
1 shredded baleen insole
— baleen bird snares

CUT 3, SECTION 6

1 bolas ball
1 lamp fragment, pottery
1 shredded baleen insole
1 toy baleen toboggan
— baleen bird snares

CUT 3, SECTION 7

3 ice picks for harpoons, Type A
1 finger rest for harpoon
1 toggle for seal poke
1 inflation plug and stopper for seal poke
1 inflation plug for seal poke
1 plug for seal poke
1 detachable lance for harpoon
1 bow splice
1 set of two marlin spikes
1 sinew wrench
2 antler stanchions for sled
1 stone net weight
1 antler rim for ice scoop
1 antler bottom and handle for ice scoop
1 two-piece ice scoop
1 wound plug
2 bolas balls
1 composite engraving knife
1 knife handle with blade slot in end
1 set of bowdrill and fire-making spindle
1 bone spindle point for bowdrill
1 mouthpiece of deer astragalus for bowdrill
1 adze handle, antler
1 adze blade for bone
1 lamp fragment, pottery
3 ulu handles
1 beamer of deer metapodial
1 cup-shaped fat scraper
1 bucket handle
1 meat fork
1 shredded baleen insole
1 toy bow, baleen
1 toggle, ornamental
1 bull-roarer
2 baleen whale effigies
1 baleen cross
1 antler strip, possibly kayak rib
— baleen bird snares

HOUSE A

The shallow depressions, one near the top of Mound A and the other leading southwestward down the slope, have been mentioned. This is the usual surface indication of a semi-subterranean igloo. Cut 4 was staked out so that the covering sod and soil could be removed from above the entrance of this structure. A somewhat larger excavation (Cut 12) was started for the same purpose above the depression that marked the location of the house. I intended to lower these cuts by arbitrary

levels until house timbers were encountered and the plan of the structure was apparent, and then continue the excavation by construction stages. Cut 4 was lowered to a depth of 18 inches and Cut 12 to a depth of 12 inches before a change in recording became necessary. No differences can be detected in the material recovered by the levels in these cuts, so their contents are merely listed without level designations in the tabulations that follow.

Building remains in Mound A were rather complex and difficult to interpret. Among the complicating factors was a ground crack filled with clear ice that ran across the front of the house where it joined the entrance. In the 1932 season, after we began to encounter timbers in Cut 12, we were under the impression that we were approaching the floor of House A. This, however, was an error. Actually in this season we dug down to and cleaned off the roofing timbers of this structure, finding quantities of material in the process, as listed below. The entrance to this house was also uncovered in the 1932 season, beneath Cut 4, and the floor deposit in the entrance partially cleaned out. In the 1936 season the excavation of Mound A was completed. The balance of the deposit in the entrance was cleaned out, and the roofing timbers of the house proper were removed. The actual floor of the structure, found some 30 inches lower down, was cleaned. A number of complete and partially complete artifacts was discovered in the process. These date the house as within the Birnirk Period.

When finally excavated, House A proved to be rectangular, about 9 feet wide at the back, 7 feet wide at the front, and 10 feet front to back. The floor consisted of flattened log puncheons running crosswise, that is, at right angles to the entrance tunnel. This floor sagged slightly in the center, but was otherwise level. No evidence of a sleeping platform was discovered.

The walls of the house were built of horizontal logs and whale jaws. In addition a number of small stakes were placed vertically on the inside of the horizontal timbers, apparently to support them. In the corners were clusters of four to six vertical posts, 8 to 10 inches in diameter, which appear to have been the roof supports. These extended upward within 18 inches of the surface, and their badly decayed upper ends in the zone of annual thaw suggest that they might have been higher.

The roof timbers were a spongy mass of badly decayed parallel logs that extended from the back towards the front of the house. These logs were about 18 inches short of the front wall, but this seems to have been due to earth movement caused by the ice wedge that ran across the structure at this point. Near their ends towards the front wall the timbers bent sharply upward, which indicates that they had bent or broken under the weight of the earth covering. So far as could be determined no ridgepole ran crosswise of the house to support a gabled roof, as in the recent Point Barrow house. Two substantial posts placed slightly out from the walls might have been intended to support such a ridgepole, but they may have been merely additional supports for roof logs that extended from wall to wall. Also, these posts may mark the limits of the sleeping area, presumably located at the back of the house.

The entrance tunnel led southward down the mound slope for a distance of 22 feet. The tunnel was 4 to 5 feet wide and about 4 feet high. The floor, formed of the scapulae of young whales, was at the same level as the floor of the house where it left the house and sloped downward, with approximately the same slope as the surface of the mound. Vertical logs and whale jawbones and scapulae formed the walls of the entrance passage. The roof was supported by logs laid across the passage from wall to wall every 5 or 6 feet. On these were placed small whale jawbones and logs running lengthwise to the entrance. These supported the blocks of cut sod that covered the entrance. A view across the entrance of House A towards the west is given in Pl. 3a. The roof timbers of the entrance can be seen. Structure D is shown in the background.

ABOVE ROOF OF HOUSE A

1 Birnirk open socket harpoon head
1 Tuquok open socket harpoon head
2 toggles for seal poke
1 bow fragment
1 arrow fragment
7 arrowhead blanks
1 atlatl, Birnirk type
1 bow piece for sled
1 pair snow goggles, one-piece
1 rib cut for bolas balls
8 bolas balls
1 composite engraving knife

1 chipped knife blade, stemmed
1 shovel, scapula
1 shovel, wood
1 wood shovel with antler shovel edge
1 adze blade for bone
2 whetstones
1 bone wedge
1 engraving tool
4 lamp fragments, pottery
1 pottery paddle
3 ulu slate blade fragments
1 beamer, deer metapodial
1 complete baleen bucket
1 baleen bucket side wall
2 pegs for staking hides
1 shredded baleen insole
1 bark doll
1 wood doll
1 toy sled
1 toy kayak
2 toy bows
1 bear canine, grooved
1 birchbark roll
— seal vertebrae on rib
— baleen knots

Floor of House A

3 Tuquok open socket harpoon heads
1 Naulock open socket harpoon head
2 Birnirk open socket harpoon heads
1 arrowpoint with multiple unilateral barbs, tapering tang
1 arrowpoint without barbs, tapering tang
1 whale harpoon head
1 slate blade for harpoon
2 foreshafts for harpoon
1 harpoon shaft
2 ice picks for harpoon
1 toggle for seal poke
1 plug for seal poke
1 stone point for lance
1 marlinspike
1 arrow fragment
2 arrowhead blanks
3 dart shaft fragments
5 side prong bird darts, Type A
1 side prong bird dart, Type B
1 kayak frame fragment
3 ribs cut for bolas balls
2 sets of bolas balls, nine to a set
1 set of 10 bolas balls
3 composite engraving-knife handles
2 slate knife blades, stemmed
1 bowdrill spindle
1 fire-making spindle
1 bone spindle point for bowdrill
1 antler bow for bowdrill
1 wood shovel handle
1 antler shovel edge
4 whale-rib mattocks
7 ulu slate blade fragments
1 complete baleen bucket
1 oval wood bucket bottom
2 bucket handles
6 meat forks
3 bone awls
1 bark doll
1 toy kayak
1 toy umiak
2 toy bows
5 toy arrows
1 toy harpoon foreshaft
1 baleen whale effigy
1 bear canine, perforated
1 bear canine, grooved
2 musk-ox horn fragments
2 whetstones

Ice Crack, House A

1 bolas ball
3 lamp fragments, pottery
1 ulu slate blade fragment
1 oval wood bucket bottom
1 bark toy winged object
1 toggle, ornamental

Cut 4, 0–18 Inches

3 Tuquok open socket harpoon heads
1 Birnirk open socket harpoon head
2 foreshafts for harpoon
1 ice pick for harpoon, Type A
1 stone point for lance
1 bird dart side prong, Type A
4 bolas balls
1 chipped knife blade, ovate
1 chipped knife blade, stemmed
1 flint flaker point
3 plain sherds
1 meat fork
1 seal effigy of bark
1 toy spoon
2 bear canines, perforated
2 seal vertebrae on rib

Cut 4, Over Entrance to House A

7 bolas balls
1 knife handle with blade slot in end
1 adze blade for bone
3 whale-rib mattocks
2 bone wedges
1 lancet point, chipped
2 lamp fragments, pottery
2 ulu slate blade fragments

Floor of Entrance to House A

1 Tasik open socket harpoon head

1 arrowhead with single barb, tapering tang
1 ice pick for harpoon, Type A
1 toggle for seal poke
3 bow fragments
4 arrow fragments
1 set of two marlinspikes
1 sinew wrench
6 arrowhead blanks
2 atlatls, Birnirk type
1 dart shaft, fragment
1 bow piece for sled
10 wound plugs
1 rib cut for bolas balls
1 set of eight bolas balls
5 additional bolas balls
1 composite engraving-knife handle
1 stemmed knife blade, chipped
1 fire-making bowdrill spindle
1 bone point for bowdrill spindle
1 complete adze with blade for cutting bone
1 adze socket piece
1 adze blade for cutting bone
1 blubber hook handle
3 bone wedges
4 lamp fragments, pottery
1 plain sherd
9 ulu slate blade fragments
1 beamer of deer metapodial
1 endscraper handle
2 meat forks
1 oval wood bucket bottom
1 bucket handle
42 pegs for staking hides
1 engraving tool
1 shredded baleen insole
1 pin-and-cup game
1 simple bone point
1 toy arrow
1 toy bow
1 toy umiak
1 drum rim with handle
1 toggle, ornamental
1 roll of prepared baleen lashing
1 baleen toboggan
1 bear canine, perforated
1 bear canine, grooved
1 birchbark roll
1 seal vertebra on rib
2 sealskin line fragments
1 pair of baby's pants, fur-lined
1 antler strip, possibly kayak rib

STRUCTURE B, CUT 5

Few of the other structures uncovered in Mound A could be interpreted as confidently as House A. Undoubtedly this was partially due to the prehistoric practice of re-using timbers from abandoned constructions. Structure B was uncovered by Cut 5, just to the east of the lower end of the entrance to House A (Fig. 13). The floor was formed of parallel flattened logs, covering an area approximately 4 feet square. The basal portion of a large whale skull formed the northern wall, and a horizontally placed whale jaw marked the east wall. Wooden posts marked the corners. The rather varied contents found on the floor of Structure B are listed below. Included is the material removed from beneath this structure in 1932 and in 1936. Two Tasik and one Natchuk open socket harpoon heads from the floor deposit appear to date this structure as late in the Birnirk Period.

Judging from the size and lack of entrance passage, Structure B is identified as a cache or meat cellar rather than a house.

FLOOR OF STRUCTURE B

1 Natchuk open socket harpoon head
2 Tasik open socket harpoon heads
1 bolas ball
1 knife handle with blade slot in end
1 mattock handle
3 whale-rib mattocks
3 lamp fragments, pottery
3 ulu slate blade fragments
1 beamer of deer metapodial
1 oval wood bucket bottom
1 bark doll
1 toy kayak
— bird snares of baleen
1 musk-ox horn fragment

BELOW STRUCTURE B

2 Birnirk open socket harpoon heads
1 arrowhead with multiple unilateral barbs, tapering tang
1 foreshaft for harpoon
1 detachable lance for harpoon
1 ice pick for harpoon, Type A
1 toggle for seal poke
1 side prong bird dart, Type A
1 baleen arrow with knobbed tang point
1 canoe paddle
8 bolas balls
1 composite engraving-knife handle
1 bone spindle point for bowdrill
3 whale-rib mattocks
1 bone wedge
3 lamp fragments, pottery
5 ulu slate blade fragments
1 oval wood bucket bottom
2 meat forks

1 toy spoon
1 drum rim
1 toggle, ornamental
1 baleen ring
1 baleen swivel
1 baleen knot
1 musk-ox horn fragment
1 arrow fragment
1 atlatl dart butt piece
1 set of four fish spearpoints
2 additional points
6 bolas balls
1 composite engraving-knife handle
1 adze socket piece
1 whale-rib mattock
2 lamp fragments, pottery
4 ulu slate blade fragments
1 ulu handle
1 beamer of deer metapodial
1 meat fork
1 wound pin
1 gut snow-shirt fragment
— baleen bird snares
— baleen knots
1 antler strip, possibly kayak rib
1 seal vertebra on rib
1 bucket handle

STRUCTURE C

A rather hopeless tangle of logs lying to the east of the entrance of House A, and north of Structure B, was designated as Structure C (Fig. 13). The logs, approximately on the same level, about 18 inches beneath the surface of the mound, were underlain by a layer of seal bones. There were no wall timbers. The four posts that appeared to be associated were not arranged to bound a rectangular area. It is somewhat uncertain whether this structure represents the remains of a building, house, or meat cellar.

One Tasik, one Natchuk, one Birnirk, and two Tuquok open socket harpoon heads were associated with the timbers and suggest that the deposits of this area and level of the mound were made about the middle of the Birnirk Period.

FLOOR OF STRUCTURE C

1 Natchuk open socket harpoon head
1 Tasik open socket harpoon head
2 Tuquok open socket harpoon heads
1 Birnirk open socket harpoon head
2 stone points for lance
1 bow fragment
1 dart shaft fragment
1 kayak frame part
2 fish spearpoints
8 bolas balls
1 slate knife blade, stemmed
1 bone spindle point for bowdrill
2 bone wedges
2 plain sherds
2 decorated sherds
1 ulu handle
6 ulu slate blade fragments
3 oval wood bucket bottoms
1 bone awl
1 toy bow
1 antler strip, possibly kayak rib
1 seal vertebra on rib

BELOW STRUCTURE C

1 Birnirk open socket harpoon head
1 ice pick for harpoon, Type A
1 dart shaft fragment
1 sled floor board
2 kayak frame parts
2 canoe paddle fragments
3 simple bone points
6 bolas balls
1 adze blade for wood
1 whale-rib mattock
2 bone wedges
7 ulu slate blade fragments
2 oval wood bucket bottoms
2 pegs for staking hides
1 bark doll
1 bear canine, perforated

10 TO 15 INCHES BELOW STRUCTURE C

2 arrow fragments
1 kayak frame part
1 baleen rimmed ice scoop
6 bolas balls
1 chipped knife blade, stemmed
1 bowdrill
1 bone spindle point for bowdrill
1 whale-rib mattock
1 walrus-rib pick
2 bone wedges
2 lamp fragments, pottery
5 ulu slate blade fragments
1 beamer, deer metapodial
2 oval wood bucket bottoms
1 wound pin
1 needle case
1 toy bark bull-roarer
1 toy bow
1 drum rim
2 toggles, ornamental
— baleen bird snares
— baleen knots
1 bear canine, grooved

20 Inches Below Structure C

1 stone point for lance
1 bow splice reënforcement
1 atlatl, Birnirk type
1 fish spearpoint
1 set of six bolas balls
6 additional bolas balls
1 antler bottom for ice scoop
1 composite engraving-knife handle
1 slate knife blade, stemmed
1 mouthpiece for bowdrill of deer astragalus
1 shovel of wood
2 whale-rib mattocks
1 flint flaker point
5 plain sherds
4 ulu slate blade fragments
1 bone awl
1 gut snow-shirt fragment
2 toy bows
2 bear canines, perforated

STRUCTURE D

Structure D lay to the west of the end of the entrance to House A (Fig. 13). It consisted of an area about 9 feet square, bounded on the southwest by two whale skulls and on the other three sides by horizontally placed jawbones of large whales. Three other jawbones extending across the structure may have been roof supports. The area bounded by these bones was excavated to a depth of 2.5 feet in 1932 and for 2 feet more in 1936, with the results listed below. However, no clearly defined floor level was discovered. The lack of harpoon heads from this area makes a very precise estimate of age impossible, but other artifacts were typical of the Birnirk Period.

Floor of Structure D

1 arrowhead with multiple unilateral barbs, tapering tang
1 toggle for seal poke
1 inflation plug for seal poke
1 sled runner of whale rib
1 shovel of scapula
1 mattock handle
2 lamp fragments, pottery
1 ulu slate blade fragment
2 complete baleen buckets
2 baleen bucket side walls
1 peg for staking hides
1 baleen toy bow
1 baleen ring for walking-staff
— baleen bird snares
— baleen knots

Below Structure D

1 slate blade for harpoon
1 detachable lance for harpoon
1 bow fragment
1 fish spearpoint
3 bolas balls
2 ovate knife blades, chipped
1 shovel of scapula
1 wood shovel
1 shovel edge of antler
1 flint flaker point
3 lamp fragments, pottery
4 ulu slate blade fragments
3 birchbark rolls

CUT 12

In late June, 1932, it became apparent that the excavation of Cut 4, which was being dug in order to expose the living quarters of House A, was actually uncovering the upper portion of its entrance tunnel. Accordingly, another excavation, Cut 12, was laid out adjacent to and just north of Cut 4. This comprised a rectangular area about 25 feet north to south and 32 feet east to west. My plan was to lower this excavation by arbitrary levels until evidence of structures was found and then to excavate by these units. When the area in Cut 12 had been lowered an average of 18 inches, it exposed the A, E, F, G, and H structures so designated on the map of Mound A (Fig. 13). The material recovered in the course of this exploratory stripping is listed below.

Cut 12, 0 to 12 Inches

2 Natchuk open socket harpoon heads
1 Tasik open socket harpoon head
1 Birnirk open socket harpoon head
2 arrowheads with single barb, tapering tang
2 arrowheads with multiple unilateral barbs, tapering tang
1 inflation plug for seal poke
1 atlatl, Birnirk type
1 side prong bird dart, Type B
1 bird dart point
1 kayak frame part
3 wound plugs
2 bone spindle points for bowdrill
1 whale-rib mattock
2 ulu slate blade fragments
1 cup-shaped fat scraper

Among Timbers Between Structures A, E, and C

1 lamp fragment, pottery
2 ulu slate blade fragments
1 oval wood bucket bottom
1 bark doll

STRUCTURE E AND INCLUDED BURIALS

The tangle of timbers, whale bones, and posts to the east of House A was designated as Structure E (Fig. 13). At 2.5 feet below the surface, the extent of excavation in 1932, several short horizontal timbers and a whale jawbone were exposed. Scattered posts had no apparent order, except for a straight row of six on the south side of the area. A single semi-flexed burial was discovered. The harpoon heads from this level indicate a Late Birnirk dating: three Tasik, one Naulock, and seven Natchuk open socket types.

Work in this area was continued in 1936. A few inches below the flexed burial mentioned above, five more burials were found. The bones were only partially in anatomical order, and many were missing (Fig. 14; Pl. 4a). Fragments of bearskin and duckskins with the feathers covered the bones except Burial 2, which was a single skull. These are probably remnants of clothing in which the bodies were dressed. However, no complete garments were recovered, so the patterns must remain in doubt. Alongside Burial 5 was a large, shallow, wooden, dish-like object. This thin, slightly curved object is shown in Fig. 15. There are lashing holes along the edges and a shallow notch in the end that has been preserved.

About 5 feet below the surface, on the same level as the floor of House A, we uncovered what appeared to be the floor level of a house, although there was no wooden floor as is usual in Birnirk houses. A quantity of specimens lay on this level, as listed below. The one unfinished Naulock Type harpoon head dates this level as within the Birnirk Period, but is insufficient evidence for more accurate placement.

Remains of structures on this 5-foot level consisted of three horizontal logs outlining a portion of a rectangle. The log marking what appeared to be the back of the house lay parallel to the side wall of House A, about 7 feet to the east. This side of the house measured 9 feet. Posts stood inside the house corners, and the two logs marking the supposed side walls were at right angles to the back wall. Unfortunately, the frozen 5-foot bank of earth to the eastward prevented us from tracing out the side walls and entrance to this house.

FLOOR OF STRUCTURE E

7 Natchuk open socket harpoon heads
3 Tasik open socket harpoon heads
1 Naulock open socket harpoon head
1 arrowhead with single barb, tapering tang
2 slate blades for harpoon
1 two-piece snow goggles
1 fish spearpoint
9 bolas balls
1 antler bottom for ice scoop
1 knife handle with blade slot in end
1 slate knife blade, stemmed

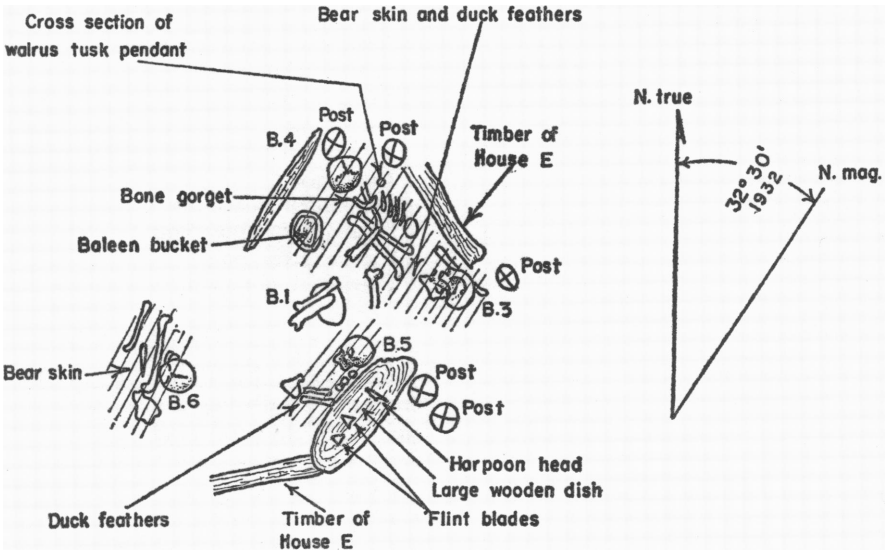


FIG. 14. Burials in Structure E, Mound A, Birnirk.

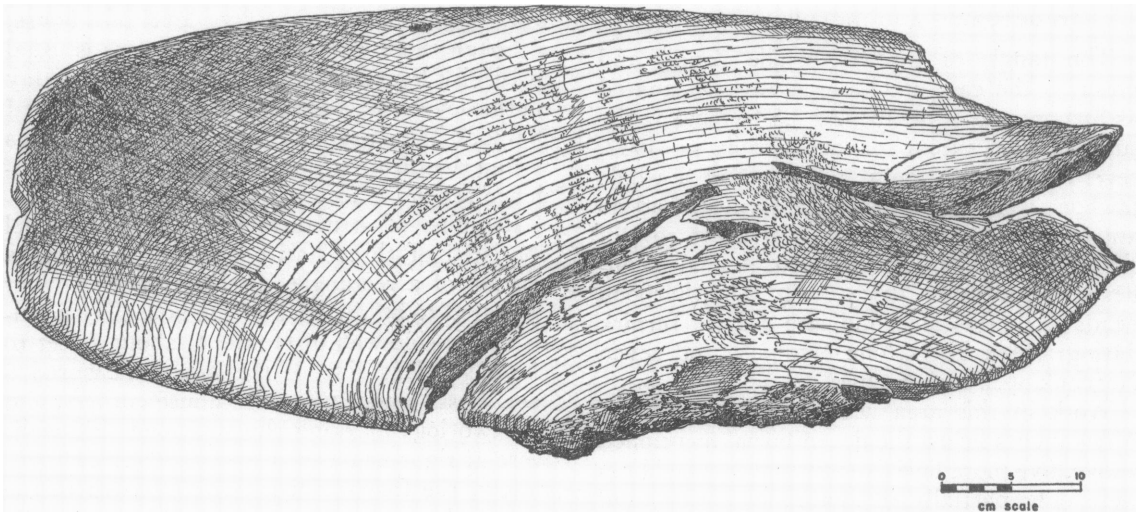


FIG. 15. Thin, wooden, dish-like object found with burials in Structure E, Mound A, Birnirk. (See location of this object in Fig. 14.)

1 bone spindle point for bowdrill
1 adze blade for bone
2 whale-rib mattocks
2 walrus-rib picks
2 whetstones
1 flint flaker point
4 lamp fragments, pottery
1 pottery paddle
6 ulu slate blade fragments
2 oval wood bucket bottoms
1 bone awl
2 pegs for staking hides
1 seal effigy, bark
1 bear canine, grooved
1 lump iron pyrites

BURIAL 3, STRUCTURE E

1 arrow fragment
1 feather cutting board
1 dart shaft fragment
1 canoe paddle fragment
1 whale-rib mattock
2 ulu slate blade fragments
1 pin-and-cup game
1 baleen toboggan

BELOW STRUCTURE E

1 Naulock open socket harpoon head
1 slate blade for harpoon
1 ice pick for harpoon, Type A
1 detachable lance for harpoon
3 stone points for lance
1 dart shaft fragment
1 atlatl dart butt piece
1 side prong bird dart, Type A
1 antler rimmed ice scoop
1 wound plug
2 ribs cut for bolas balls
14 bolas balls
1 composite engraving-knife handle
2 chipped knife blades, stemmed
3 slate knife blades, stemmed
2 adze handles
1 adze blade for wood
1 walrus-rib pick
4 whale-rib mattocks
1 whetstone
3 ulu handles
15 ulu slate blade fragments
1 ulu cutting board
2 oval wood bucket bottoms
1 wood meat dish
2 meat forks
2 bone awls
1 shredded baleen insole
1 bundle of human hair
1 antler strip, possibly kayak rib
1 seal vertebra on rib

STRUCTURE F

Structure F, adjacent to the northeast corner of House A, was only 8 inches below the surface of the mound (Fig. 13). Its most prominent feature was a platform of planks, hewn to a thickness of only 1 inch. Seven parallel planks and four at right angles to these formed a space that measured roughly 8 by 9 feet. A clus-

ter of small posts at the southern corner and additional posts to the east and north of the floored area may have marked the corners. No wall timbers were found, nor was there evidence of an entrance. This presumed dwelling structure had obviously been extensively robbed for timbers.

Very little archeological material was found on this floor. The single harpoon head of the Tasik Open Socket Type suggests a date late within the Birnirk Period, but is insufficient evidence for any firm conclusion to be reached.

Excavations made in 1936 beneath the floor level of Structure F uncovered additional archeological material. However, no constructional features could be determined in this area.

FLOOR OF STRUCTURE F

1 Tasik open socket harpoon head
1 barbed arrowhead with stone blade, knobbed tang
1 harpoon shaft fragment
2 bone spindle points for bowdrill
1 bone wedge
3 ulu slate blade fragments
1 meat fork
1 birchbark roll

15 INCHES BELOW FLOOR OF STRUCTURE F

1 box for harpoon blades
1 harpoon shaft
2 dart shaft fragments
1 bottom crosspiece for umiak
1 knife handle with blade slot in end
1 bone wedge
4 lamp fragments, pottery
1 decorated sherd
1 meat fork
1 bear canine, grooved
1 birchbark roll

STRUCTURE G

North of House A, on the flank of Mound A, a rectangular area measuring 9 by perhaps 6 feet was outlined by a row of small posts on the southwestern side and by whale jaws and fragments of logs on the other sides (Fig. 13). There was a considerable quantity of clear ice on the level at which these supposed side wall timbers lay, but no clear-cut evidence of a floor could be found. Nevertheless, the small quantity of material gathered here is listed as floor deposit. One Tasik, two Natchuk, and one Birnirk open socket harpoon heads from Cut 12, immediately above, suggest a Middle Birnirk Period dating for this deposit.

Further excavation in this area in 1936 yielded additional specimens, but offered nothing to clarify the nature of the structure.

FLOOR OF STRUCTURE G

4 barbed arrowheads with stone blade, knobbed tang
1 inflation plug and stopper for seal poke
1 detachable lance for harpoon
2 dart shaft fragments
1 whale-rib sled runner
1 bolas ball
1 knife handle with blade slot in end
2 chipped ovate knife blades
2 beamers of deer metapodial
— baleen knots

STRUCTURE H

Despite the fact that its wooden floor was only 10 inches below the surface of the mound, Structure H was clearly a meat cellar. Possibly this portion of the mound had been graded down to obtain sod for subsequent constructions. The parallel floor planks, about 8 inches wide, had been hewn to a thickness of 2 inches. Single horizontal logs marked the four walls, enclosing a rectangular space 3.5 by 5.5 feet. Posts stood at three of the corners. In addition to considerable blubber on the floor of this cache, there were a number of archeological specimens, primarily hunting gear. A group of harpoons found together included one Tipiruk, one Tasik, two Oopik, and two Natchuk open socket types, suggesting a date late in the Birnirk Period.

FLOOR OF STRUCTURE H

2 Natchuk open socket harpoon heads
1 Tasik open socket harpoon head
1 Tipiruk open socket harpoon head
2 Oopik open socket harpoon heads
1 arrowhead with barbs, stone blade, knobbed tang
1 arrowhead with single barb, tapering tang
1 slate blade for harpoon
2 harpoon shaft fragments
1 toggle for seal poke
1 inflation plug for seal poke
4 detachable lances for harpoon
2 bow fragments
1 marlinspike
1 dart shaft fragment
1 atlatl dart butt piece

1 simple bone point
1 set of seven bolas balls
5 bolas balls
2 composite engraving-knife handles
3 chipped knife blades, stemmed
1 shovel of scapula
1 adze socket piece
1 adze socket piece with blade for bone
3 whale-rib mattocks
1 whetstone
4 bone wedges
1 engraving tool, ivory
1 lamp fragment, pottery
2 decorated sherds
2 ulu handles
10 ulu slate blade fragments
1 sidescraper, chipped
2 beamers of deer metapodial
6 oval wood bucket bottoms
1 loon or duck sternum spoon
1 bone awl
10 pegs for staking hides
1 seal effigy of bark
1 toy lamp of bark
1 toy umiak
1 toy arrow
2 bundles of human hair
1 antler strip, possibly kayak rib
2 bear canines, perforated
1 birchbark roll

Mound C, Cut 14

The southernmost of the well-defined mounds at the Birnirk Site was a small rise about 4 feet high and 60 feet in diameter. Late in the 1932 season a 12-foot square cut was started in the top of this mound and designated as Cut 14. However, little more than the removal of the sod was accomplished in this season. In 1936 it was found that the mound had not been molested by the Eskimo and that the exposed soil had thawed to a depth of 18 inches, so excavation proceeded without delay.

Mound C (Fig. 16) contained only one house, a welcome relief from the unsolvable complexity of many of the structures in Mound A. The rectangular cut blocks of sod that had been placed over the roofing timbers lay directly on the floor of the house. Evidently, most of the roofing timbers had been removed soon after the building was abandoned. The floor, only 18 inches below the present surface, had also been partially removed. Five planks, each about 10 inches wide, adzed to a thickness of about 2 inches, were all that was left of the roof. These lay parallel and extended from the front of the house about halfway to the back wall. Beneath these planks several round logs, about 6 inches in diameter, extended crosswise of the house. These were not well adzed but may be the remains of flooring.

The house was roughly square, about 11 by 11 feet. Single horizontal logs marked the base of two walls (Pl. 5). The southwestern wall, formed by two short logs, turned inward slightly along the front half of the house. Single or double posts stood inside each corner, and a single post was placed inside the break in the line of the southwest wall. The posts did not extend over 12 inches above floor level, and there is no positive evidence as to how the upper portions of the walls were built; the timbers have all been removed. Presumably they also were made by the stacking of horizontal logs against the corner posts. Nor is there clear evidence as

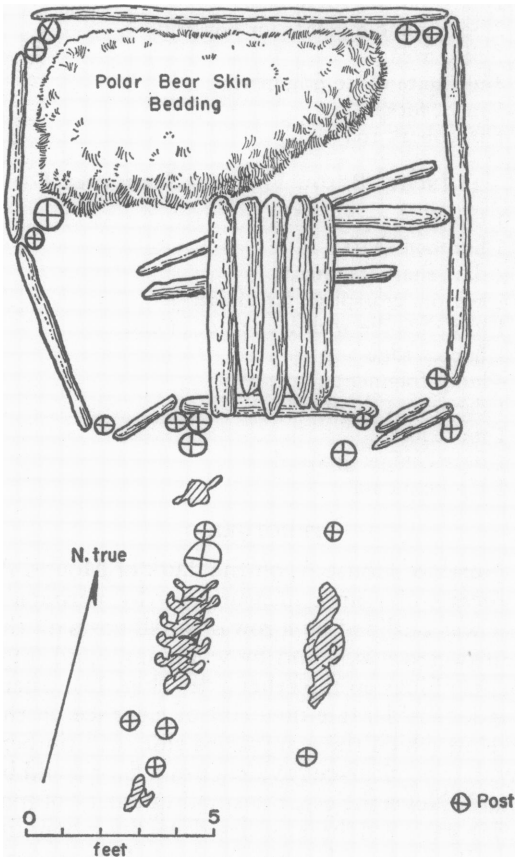


Fig. 16. House in Mound C, Birnirk Site. (See also Pl. 5.)

to roof construction. The two posts near the center of the side wall, on the southwest side, may have supported a ridgepole, but there are no corresponding supports on the opposite side of the house.

The sleeping area was in the back half of the house and on the same level as the floor. Two polar-bear skins rested on quantities of wood shavings and chips. These undoubtedly had been intentionally placed as insulation.

The entrance tunnel, about 3 feet wide, extended southward from the southeastern side of the house for a distance of about 12 feet. The floor, at the same level as the house floor where it left the house, sloped downward very slightly to the south. Only the lower parts of the entrance walls remained. These were built of posts, a small whale skull, and an articulated portion of the vertebral column of a whale. No storage rooms opened into this tunnel.

A good sample of the material culture was recovered from the floor, and immediately below the floor, of House A, Mound C, as is listed below. Three harpoon heads were found: one was of the Naulock Type and two were of the Birnirk Open Socket Type. These appear to date the structure fairly early in the Birnirk Period.

Over Roof of House A

1 Birnirk open socket harpoon head

Floor of House A

1 Naulock open socket harpoon head
2 Birnirk open socket harpoon heads
3 arrowheads with single barb, tapering tang
1 arrowhead with multiple unilateral barbs, tapering tang
1 arrowhead with slot for stone blade, tapering tang
5 toggles for seal poke
1 inflation plug for seal poke
2 detachable lances for harpoon
2 arrow fragments
1 atlatl dart shaft fragment
2 side prongs for bird dart, Type A
2 side prongs for bird dart, Type B
1 dart point
1 sled stanchion of antler
2 one-piece snow goggles
1 set of three fish spearpoints
1 group of two bolas balls, group of 18, group of three
2 composite engraving-knife handles
1 chipped ovate knife blade
1 chipped stemmed knife blade
1 bowdrill
1 bone spindle point for bowdrill
1 mouthpiece of deer astragalus for bowdrill
5 whale-rib mattocks
1 flint flaker, point and handle
3 bone wedges
1 engraving tool
1 plain sherd
3 ulu handles
4 ulu slate blade fragments
1 endscraper blade
2 beamers of deer metapodial
1 complete baleen bucket
4 oval wood bucket bottoms
1 ice scoop with antler rim
1 loon or duck sternum spoon
1 fish scaler
2 bone awls
1 snow-shirt fragment, gut
1 boot, Birnirk type
— fringe
1 toy seal effigy, ivory
1 toy kayak
1 toy baleen bow
2 pairs of toggles, ornamental
1 baleen whale effigy
1 bear canine, perforated
1 bear canine, grooved
1 three-strand braided sinew
1 toggle, ornamental

Below Floor of House A

1 ulu handle
4 bolas balls
2 ulu slate blade fragments
1 fish scaler
1 toggle, ornamental
1 human hair bundle

Mound D, Cut 7

Mound D lies just to the east of Mound A (Fig. 11). It had been extensively disturbed by excavations made by the Eskimo, but an undisturbed area was found near its high point, and an 8-by-11-foot rectangle was marked for excavation. This was taken down in seven arbitrary levels to a total depth of 31 inches. The base of the mound was approximately 1 foot beneath the surface of the tundra about its flanks, and the accumulation rested on clean beach sand rather than a layer of vegetation such as now surrounds the mounds of the Birnirk Site.

The relatively scanty results from Cut 7 are listed below. One Tuquok and two Naulock open socket type harpoon heads from this cut date it within the Birnirk Period.

CUT 7, SECTION 1

2 bone spindle points for bowdrill
2 bolas balls
1 ulu slate blade fragment

CUT 7, SECTION 2

1 Tuquok open socket harpoon head
1 bolas ball
4 lamp fragments, pottery
— baleen knots

CUT 7, SECTION 3

1 Naulock open socket harpoon head
1 bolas ball
3 lamp fragments, pottery
1 ulu slate blade fragment
1 toy bow, wood

CUT 7, SECTION 4

1 Naulock open socket harpoon head
1 Birnirk open socket harpoon head
1 shovel of scapula
1 ulu slate blade fragment
1 beamer of deer metapodial

CUT 7, SECTION 5

Nothing

CUT 7, SECTION 6

1 arrowhead with multiple unilateral barbs

CUT 7, SECTION 7

1 arrowhead with multiple unilateral barbs, tapering tang
2 decorated sherds
1 complete baleen bucket
1 baleen toy bow
— baleen knots

CUT 7, MISCELLANEOUS

1 canoe paddle fragment
1 shovel of scapula
1 antler strip, possible kayak rib

MOUND G, CUT 8

In 1932 a rectangular excavation measuring 6.5 by 11.5 feet was made in Mound G of the Birnirk group (Fig. 11). Eight arbitrary levels were made in excavating this cut to a depth of 40 inches, the base of the accumulation. Some timbers were uncovered at a depth of 29 inches, but their arrangement was not regular enough to warrant enlarging the excavation in the hope of exposing a house or other structure. The relatively small amount of archeological material recovered is listed below. Again the base of this deposit rested on clean beach sand rather than tundra. This contact was about 18 inches below the surrounding ground level.

CUT 8, SECTION 1

Nothing

CUT 8, SECTION 2

3 bone spindle points for bowdrill
1 plain sherd
1 ulu slate blade fragment

CUT 8, SECTION 3

Nothing

CUT 8, SECTION 4

2 wound pins

CUT 8, SECTION 5

1 atlatl dart shaft fragment
2 bolas balls
1 bone wedge
1 decorated sherd
1 plain sherd
2 pegs for staking hides
1 toy arrow

CUT 8, SECTION 6

1 side prong atlatl, Type A
1 shovel of scapula
2 lamp fragments, pottery
1 ulu slate blade fragment
1 baleen toboggan
— baleen knots

CUT 8, SECTION 7

Nothing

MOUND H, CUT 9

Mound H at the northeastern end of the site was the largest, as well as the highest, of the Birnirk mounds (Fig. 11). Cut 9, measuring 10 by 11.5 feet, was marked out in a slight depression believed to indicate the presence of a house in the highest part of the mound. I intended to lower this excavation as rapidly as possible, cutting through any buildings encountered, in an attempt to reach the base of the mound. This goal was not achieved. The seven levels dug carried the cut only to a depth of 36 inches. Mound H rises at least 8 feet above the surrounding flat land.

Little structural evidence was encountered. At 16 inches, timbers and a layer of gravel firmly cemented by blubber were uncovered. A layer of clear ice found at 25 inches suggested

the possibility that this ice may have formed on the floor of a building, but no definite evidence of a building was obtained.

The archeological material recovered by this cut is listed below. Two Birnirk Open Socket Type harpoon heads were found, which suggests that the deposit may date from the early part of the Birnirk Period.

Mound H was trenched extensively by the group of archeologists from Harvard University working under the direction of Wilbert Carter from 1951 to 1953.

Cut 9, Section 1

1 slate blade for harpoon
1 bolas ball
1 chipped ovate knife blade
1 stemmed slate knife blade
1 plain sherd
1 endscraper blade

Cut 9, Section 2

1 arrow fragment
1 bone wedge
1 decorated sherd
3 plain sherds

Cut 9, Section 3

1 Birnirk open socket harpoon head
2 lamp fragments, pottery
5 plain sherds

Cut 9, Section 4

1 decorated sherd
1 plain sherd

Cut 9, Section 5

1 side prong bird dart, Type A
1 plain sherd
1 ulu slate blade fragment

Cut 9, Section 6

1 bolas ball
3 plain sherds
2 ulu slate blade fragments
— baleen knots

Cut 9, Section 7

1 Birnirk open socket harpoon head
1 ice pick for harpoon, Type A
1 arrow fragment
1 bolas ball
1 sealskin bow case fragment
1 bone wedge
2 decorated sherds
2 plain sherds
1 ulu slate blade fragment

Mound J, Cuts 1 and 13

Mound J, roughly 3 feet high and 70 feet in diameter, lay in the second "street" of the Birnirk Site, just southwest of Mound H (Fig. 11). Cut 1, 10 feet square, was started in the hope of uncovering a house. The first 8-inch arbitrary level revealed posts and wall timbers, so digging according to levels was abandoned.

When completely uncovered, House A of Mound J proved to be rectangular, measuring 9 by 10 feet (Fig. 17). The floor, 35 inches below the surface of the mound, was formed by parallel logs hewn flat. However, they were not parallel to the walls of the house, but crossed the structure at almost a 45-degree angle. Large posts, about 10 inches in diameter, marked two of the corners; three posts were grouped at the southern corner. The western two-thirds of the house was occupied by what appears to have been the sleeping platform which was elevated about 12 inches above the floor and partially floored by flattened logs, also laid at an angle to the walls. Quantities of archeological material were recovered from both the floor surface and the sleeping platform. Logs about 8 inches in diameter had been laid outside the corner posts to form the base of the house walls. Inside these walls, along portions of three sides, the vertical wall timbers, small logs 4 to 6 inches in diameter, stood side by side. These extended to within a foot of the surface where decay had destroyed them.

An entrance tunnel about 4 feet wide, with a floor 12 inches below the floor of House A, could be traced from the southwestern corner of the building for a distance of 15 feet. The walls and roof timbers had been disarranged and many removed, but, as usual, both logs and whale bones were among the remaining timbers. How this tunnel connected with the house is not clear. There was no hole or depression in the floor, and the fact that the wall timbers were missing on that side made it impossible to determine how the two house units were connected—if they actually were. An entrance tunnel running at an angle breaks all known canons of Eskimo architecture.

Three harpoon heads found on the floor and sleeping platform of House A appear to date it te in the Birnirk Period. They were one Naulock, one Tipiruk, and one Natchuk open socket types.

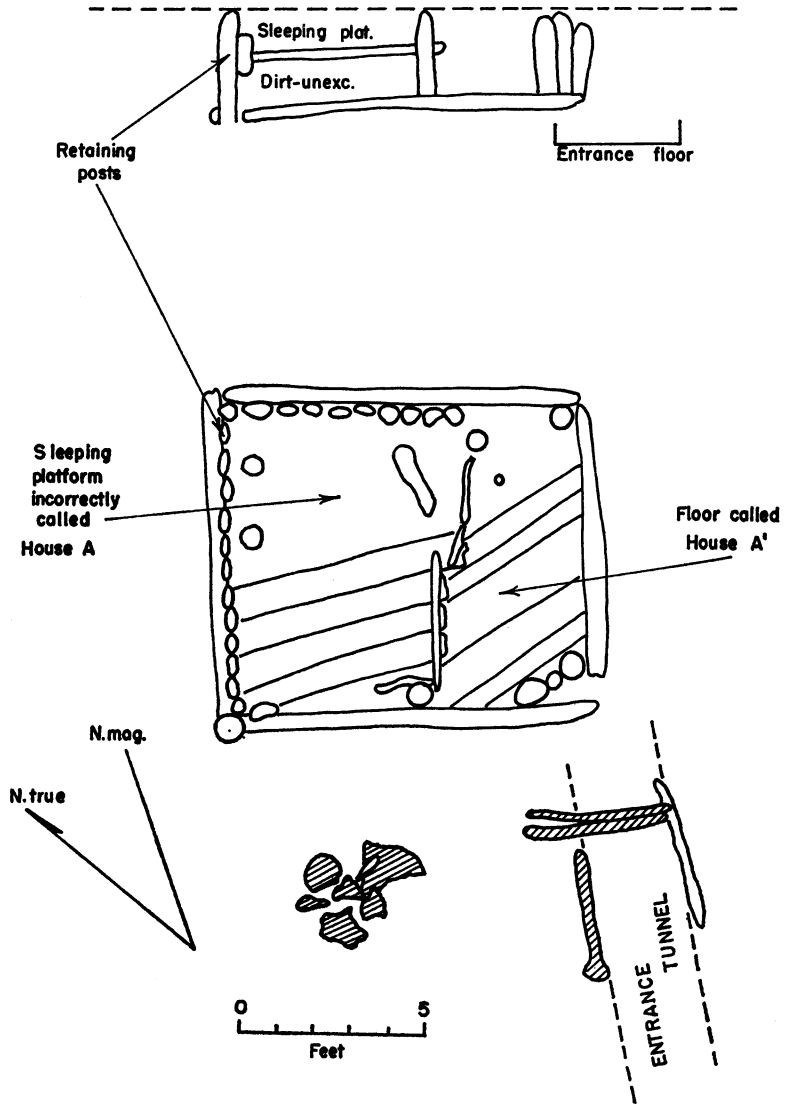


FIG. 17. Plan and section of House A, Mound J, Birnirk.

CUT 1, SECTION 1

1 Alilu closed socket harpoon head
1 bolas ball
1 bone wedge
1 ulu slate blade fragment
— baleen knots

CUT 1, SECTION 2

Nothing

CUT 1, SECTION 3

2 side prongs for bird dart, Type A

FLOOR NO. 1 OF HOUSE A

1 Natchuk open socket harpoon head
1 Tipiruk open socket harpoon head
1 Naulock open socket harpoon head
1 arrowhead with multiple unilateral barbs, tapering tang
1 ice pick for harpoon, Type A
1 detachable lance for harpoon
1 antler stanchion for sled
1 kayak frame part (?)
1 fish spearpoint
2 antler rimmed ice scoops

1 group of 13 bolas balls
1 group of 21 bolas balls
1 composite engraving-knife handle
1 ovate knife blade, chipped
1 bone spindle point for bowdrill
1 mouthpiece of deer astragalus for bowdrill
1 antler shovel edge
1 adze blade for bone
2 whale-rib mattocks
2 whetstones
1 bone wedge
4 lamp fragments, pottery
9 plain sherds
9 ulu slate blade fragments
1 beamer of deer metapodial
1 sealskin bag
1 toy baleen bow
1 toggle, ornamental
1 baleen knot
1 antler strip, possible kayak rib
2 seal vertebrae on ribs
1 needle case

Floor No. 2 of House A

1 toggle for seal poke
2 stone points for lance
1 marlinspike
2 arrow fragments
1 atlatl dart shaft fragment
1 antler rimmed ice scoop
1 bark wound plug
6 bolas balls
1 composite engraving-knife handle
1 knife handle with blade slot in end
1 ovate knife blade, chipped
1 bone spindle point for bowdrill
1 mattock handle
2 whale-rib mattocks
2 plain sherds
5 ulu slate blade fragments
2 oval wood bucket bottoms
2 pegs for staking hides
1 drum rim
1 baleen whale effigy
3 antler strips, possible kayak ribs
1 bear canine, perforated
2 seal vertebrae on ribs

Cut 13, Section 1

1 Birnirk open socket harpoon head
1 slate blade for harpoon
1 bow splice reënforcement
1 atlatl dart point
2 knife handles with blade slot in end
1 stemmed knife blade, chipped
1 decorated sherd
3 plain sherds
5 ulu slate blade fragments
1 bone awl
1 bark doll
— baleen knots

Cut 13, Section 2

2 slate blades for harpoon
1 ice pick for harpoon, Type A
1 stone point for lance
1 fish spearpoint
8 bolas balls
1 knife handle with blade slot in end
1 ovate knife blade, chipped
3 bone spindle points for bowdrill
1 adze blade for wood
1 bone wedge
4 lamp fragments, pottery
3 decorated sherds
6 plain sherds
4 ulu slate blade fragments
1 oval wood bucket bottom
1 loon or duck sternum spoon
1 fish scaler
3 seal effigies of bark
1 toy pick handle
1 toy kayak
1 baleen bird snare
4 baleen knots
1 birchbark roll
1 three-strand braided sinew
1 arrow blank

Cut 13, Section 3

1 arrowhead with opposing barbs, tapering tang
1 ice pick for harpoon, Type A
1 arrow fragment
1 fish spearpoint
1 antler rim for ice scoop
1 bolas ball
3 decorated sherds
1 complete baleen bucket
1 peg for staking hides
1 toy bow
1 baleen bird snare
1 seal vertebra on rib
— baleen knots

Cut 13, Section 4

1 bow fragment
1 marlinspike
1 arrow fragment
1 atlatl dart shaft fragment
1 baleen rim for ice scoop
1 lamp fragment
2 pin-and-cup games
1 toy bull-roarer
1 toy baleen toboggan

— baleen knots
1 seal vertebra on rib
1 bolas ball

CUT 13, SECTION 5

1 arrow fragment
— baleen knots

CUT 13, SECTION 6

1 detachable lance for harpoon
1 ulu slate blade fragment
1 boot, Birnirk type

MOUND O

From excavations that had been made by Eskimo, there were collected the following items:

1 whale-rib mattock
2 complete baleen buckets
2 boots, Birnirk type

MOUND R, CUT 11 AND INCLUDED BURIALS

Mound R, a small rise about 3 feet high and 40 feet in diameter, was located farthest from the beach on the southeastern side of the site (Fig. 11). In consideration of its locality, it was possible that it was one of the older mounds at the site. Because it was small it might be expected to contain only a single house, a relief from the complexity of Mound A. Accordingly, a rectangular area 18 by 20 feet was laid out over the mound, and the sod was removed to a depth of 6 inches. This revealed the decayed tops of several posts and the remains of three or more partially disarticulated skeletons. Burial 1 lay on its back, with both arms and legs tightly flexed. Nearby were an unworked deer jaw, a baleen bucket, an ivory needle case (Fig. 103e, e'), and several flint blades for a man's knife. The skull of this skeleton was in place, a condition not true of the other two burials.

Burial 2 was extended on the back, but only a few bones of the upper part of the body were present. There were no grave goods.

Burial 3 lay on its back, and, as with Burial 1, the arms and legs were tightly flexed. The skull was missing. There were no accompanying grave goods.

Obviously these burials were not recent and must be later than the house in Mound R, because they were placed on the surface of the ground after the house had been abandoned and had collapsed. Of the artifacts with Burial 1, only the needle case offers a possible basis for dating.

As excavation proceeded beneath the burials in Mound R, the outlines of the house were not immediately traceable. The mound was untouched for several weeks in the summer of 1932. The thawing of the accumulated layer of ice on the floor of the building before it collapsed caused a rectangular area to sink and outlined its shape. The house had been approximately 10 feet square, and its floor was 2 feet below the surface (Fig. 18). Nearly all the timbers had been removed. Only a layer of matted refuse and the clear ice mentioned above indicated the floor area. Only the two corner posts at the back of the house and a small section of the front wall, formed by five vertical posts, remained.

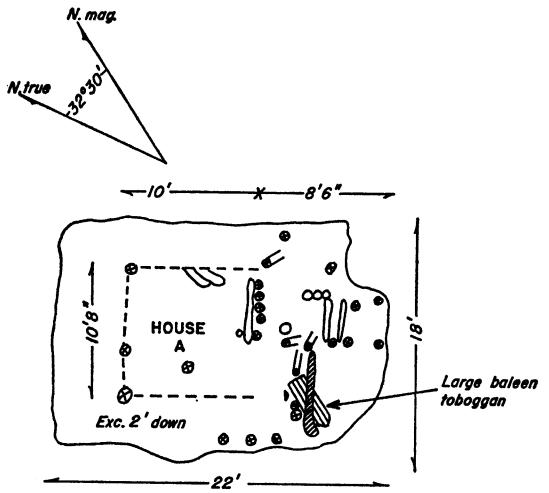


FIG. 18. Plan of house, Mound R, Birnirk. Most of the timbers have been robbed from this structure.

Remnants of the entrance tunnel could be traced for 10 feet, extending southward from the south side of the house. It was about 3.5 feet wide; the floor was at the same level as the floor of the house. Most of the timbers from the entrance had also been removed. Only 11 of the posts that formed the side walls and two logs laid across as roof supports were left.

West of the entrance tunnel there were other posts, a whale jaw, and a large baleen toboggan. Near the toboggan was a Birnirk open socket harpoon head. Possibly these items indicate the

location of an underground meat cellar which also had been robbed of most of its timbers. Apparently the preliminary guess that Mound R contained only one house structure was correct. The condition of the ruin, as well as the single harpoon head, suggests that the house was abandoned during the early phase of the occupation of the Birnirk Site.

Cut 11 Above House A

1 sled floor board
2 plain sherds
1 gut snow-shirt fragment
1 four-strand baleen strip
2 rolls of prepared baleen lashing
1 bundle of human hair
1 needle case

Floor of House A

1 Birnirk open socket harpoon head
1 arrowhead with single barb, tapering tang
1 toggle for seal poke
2 arrow fragments
1 atlatl dart shaft fragment
1 dart point
1 kayak frame part (?)
1 two-piece snow goggles
1 lance blade, chipped
1 bolas ball
1 slate knife blade, stemmed
1 bone spindle point for bowdrill
1 shovel of scapula
1 flint flaker point
1 bone wedge
3 lamp fragments, pottery
12 plain sherds
5 ulu slate blade fragments
1 beamer of deer metapodial
1 oval wood bucket bottom
1 meat fork
1 boot, Birnirk type
1 toy bull-roarer
1 toy kayak
1 toy arrow
1 roll of prepared baleen lashing
1 baleen bird snare
1 baleen knot
1 bundle of human hair

Miscellaneous

1 antler rim for ice scoop
1 bolas ball
1 boot, Birnirk type

Mound S, Cut 6

Mound S, about 2 feet high and 60 feet in diameter, lies at the southeastern side of the Birnirk Site, between Mounds R and A (Fig. 11). A small cut, 9 feet square, was laid out near the top of this mound and carried to a depth of 24 inches, the base of the mound. The rather small quantity of items found is listed below. No harpoon heads were discovered.

Cut 6, Section 1

1 simple bone point
1 bolas ball
2 lamp fragments, pottery
4 decorated sherds
1 ulu slate blade fragment
1 bone awl

Cut 6, Section 2

1 knife handle with blade slot in end
5 ulu handles
1 two-piece ice scoop of antler
1 loon or duck sternum spoon
1 gut snow-shirt fragment
1 boot, Birnirk type
1 face piece for parka
1 wood bucket bottom, round
— baleen knots

Cut 6, Section 3

1 plain sherd
1 seal vertebra on rib
— baleen knots

Cut 6, Section 4

Nothing

Cut 6, Section 5

1 ulu slate blade fragment
2 baleen bird snares
1 baleen toboggan, complete (Pl. 4b)
— baleen knots

NUVUWARUK

At the present Barrow Village a lake called "E-set-quok"[1] is cut off from the sea by a sand spit. This obviously is the drowned valley of a small stream flooded by the lowering of the land, as is described above (pp. 34 ff.). In 1881 when P. H. Ray arrived at Barrow with his party to establish an observation station for the International Polar Year, he found the sod-

[1] Murdoch, 1892, 27, spells this "Isûtkwa."

covered houses and recent ruins of the village of Utkiavik situated on the high land to the south of the mouth of this lake. In order to keep his party somewhat apart from the natives, Ray chose the low point to the north of the mouth of the lake as the site for his station.

Later, Charles D. Brower, trader at Barrow for more than 50 years, erected his trading post, warehouses, and dwelling on the approximate site of Ray's original building and utilized as a meat cellar the pit which Ray's party had dug to take earth temperatures. A few Eskimo families also built their homes on this side of the lagoon, and this area became a part of the Barrow Village. However, the spot had been inhabited in prehistoric times. In his report, Ray casually mentions these remains: "On the point where the station was established were mounds marking the site of three huts dating back to the time when they had no iron and men 'talked like dogs.'"[1]

Most of the area of this small point of land was occupied by houses, meat cellars, and storage racks in 1932. However, I was able to put down three 12-foot-square cuts on the edge of the bank adjacent to the sand spit (Fig. 6). During the oil field activity at Barrow in the early 1950's, this point was cut back by a bulldozer, and the terrain where the cuts were located was destroyed. The Eskimo name for this point is "Nu-vu-waruk," and that name is used to designate the site.

[1] Ray, 1885, 37.

Cut 1

This excavation was taken to a depth of 22 inches, the base of the deposit, in three arbitrary levels. All levels yielded iron, glass, and other items of European manufacture.

Cut 2

This excavation yielded so little material that there is no point in listing it.

Cut 3

Four arbitrary levels took this cut down to a depth of 30 inches, the base of the deposit. Little material was obtained in this excavation. Most notable was a Thule 2 harpoon point from the bottom level.

THE NUNAGIAK SITE

Point Belcher, situated about 85 miles southwest of Point Barrow and 18 miles northeast of the village of Wainwright, forms a slight bend in the coast line (Fig. 1). The present coast is a barrier beach that rises 6 to 10 feet above sea level, and is from 300 yards to ½ mile wide. This beach, 1 to 2 miles from the low rolling mainland hills along this part of the coast, has enclosed a series of lagoons that lie parallel to it. These normally contain fresh water. The Nunagiak Site, located on the barrier beach at Point Belcher, consists of some 13 mounds arranged along an old beach line about 700 feet inland from the present shore of the Arctic Ocean. The mounds are beside the shore of an enclosed lagoon. Near the site there is a strip of land that extends from the barrier beach to the mainland, so that in summer there is easy access to the interior. Doubtless the inhabitants of Nunagiak made the same use of this route that we did: to hunt the caribou that come down to the coast in summer.

The 13 mounds at Nunagiak range up to 10 feet in height. Several are quite extensive (Fig. 19). As were the mounds at the Birnirk Site near Point Barrow, these were obviously accumulated by the construction of new houses atop the ruins of old ones. The outlines of the most recent houses are plainly visible and are indicated on the map. These structures were not abandoned until well after contact with the whalers, as is demonstrated by the quantities of barrel hoops, old buckets, and objects of metal found in them. About ½ mile to the northeast of this village, up the beach, are the foundations of what evidently was a building constructed by white men, probably a trading post established here before the site was abandoned.

The recent houses in the Nunagiak mounds average about 12 feet square. Few timbers were visible in a surface examination of the house pits, 3 to 4 feet deep, but there were enough to suggest that the buildings conformed to the pattern of the Point Barrow house described by Murdoch with vertical wall timbers and a ridgepole running crosswise of the house. The houses were situated so that the entrance tunnels, 20 to 30 feet long, sloped down the sides

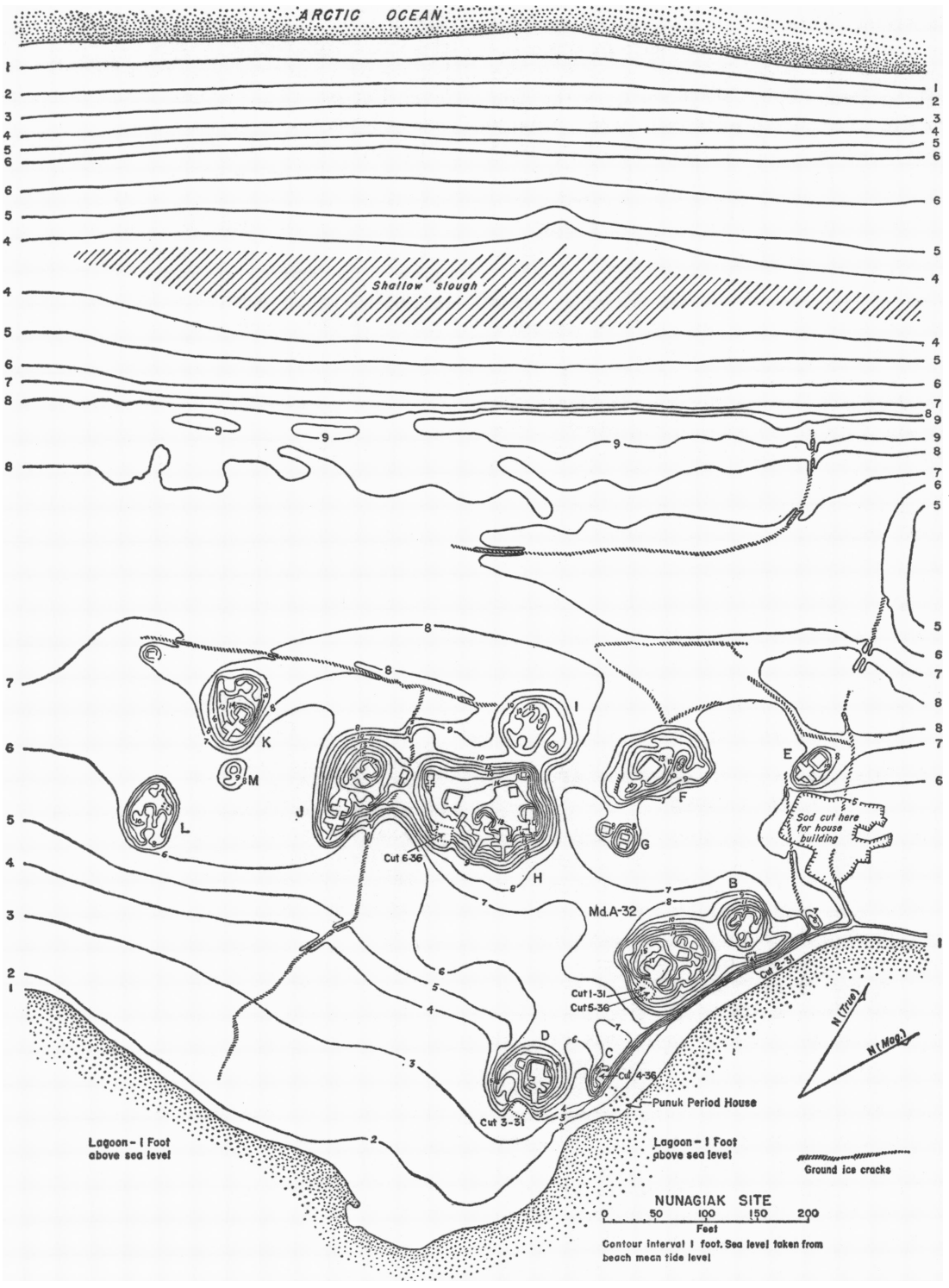


FIG. 19. Contour map of Nunagiak Site made in 1953. Recently abandoned houses are shown as rectangles; excavations are bordered by dotted lines.

of a mound. Two to four storage and cooking rooms opened off these tunnels; in some instances an attached room was as large as the dwelling area. Behind the houses, on the side opposite the entrance tunnel, were usually found four cut-off stumps of rack posts, usually whale jawbones, spaced about 10 feet apart. Three of the supports for the elevated cache were still standing behind the recent house on Mound A, providing a landmark for travelers along this monotonous coast line (Pl. 7a).

One of the mounds, F, contained a larger house outline than the others; this structure had no entrance tunnel. The modern Eskimo are doubtless correct in identifying it as a *katregi*, or men's house, for there is a large pile of wood chips on its south flank. Much of the work of making boats, tools, and weapons was done in these club houses.

Scattered about on the mounds and on the surrounding flat ground were a number of meat cellars. They were generally rather well preserved, and apparently several had been cleaned out and used recently. In several areas around the houses, as is shown on the map (Fig. 19), the sod had been cut for the construction of houses and meat cellars. Apparently it takes the slow-growing tundra decades to recover from such operations.

Nunagiak and the Question of Subsidence

My attention was initially called to the Nunagiak Site in August, 1931, when Mr. Evans, a school teacher at Wainwright, showed me a harpoon head of Punuk style, a head not only typical of the Punuk Period, but with features almost peculiar to St. Lawrence Island below Bering Strait. This had been found at Nunagiak. Upon arrival at the site it was discovered that an Eskimo family was camped there, busily mining for artifacts. The Punuk style ivory specimens were being recovered from building remains under the narrow sandy beach of the lagoon, below the half cut-away remains of the small house mound, C (Fig. 19). I could not dispossess the Eskimo from this rich claim and had to be content with buying the specimens as they found them. However, in 1936, when I came up this coast again, there was no local competition, and I was able to excavate what remained after the unsystematic digging of the natives. This is described below. The notable feature was that the remains of this structure extended below the water of the lagoon, which at that time was 1 foot above sea level. For practical purposes, the construction was at sea level.

Eskimo would not construct a dwelling so near sea level. They would be least likely to in a situation such as this, where the lagoon outlet is certain to be dammed up by autumn storms and winter ice pressure so that in the spring the water in the lagoon rises several feet above normal before it can overflow and cut a new outlet to the sea. The logical conclusion seems to be that the area has subsided since this house was constructed.

Cut 1

The first excavation at Nunagiak was a strata cut, 12 feet square, placed on the sloping flank of Mound A on the south side, to the entrance of the latest house that was built atop this mound (Fig. 19). This cut was taken down only two levels in 1931. When I returned to work at this locality in 1936, this cut had been thoroughly disturbed by the Eskimo, and it was useless to continue work there.

Mound A

Cut 1, Section 1

2 Nuwuk closed socket harpoon heads
1 sled shoe, whale bone
1 antler rim for ice scoop
1 bolas ball of deer astragalus
1 composite engraving-knife handle
1 knife handle with blade slot in end
1 adze socket piece
1 lamp fragment of soapstone
4 plain sherds
1 ulu slate blade fragment
2 endscraper blades
1 toy bow fragment

Cut 1, Section 2

1 shovel edge, bone
6 ulu slate blade fragments
1 toy ulu blade
1 endscraper blade
3 thimble holder fragments
1 toy bow fragment
1 toggle, ornamental
1 drum rim splice, antler
1 slate blade for harpoon
1 ice pick for harpoon
1 bow fragment
1 simple bone point

1 composite engraving-knife handle
2 large slate blades
1 adze socket piece
1 plain sherd
1 needle case
1 boot sole
1 bear canine, perforated

Cut 2

In 1931 a 12-foot-square excavation was started adjacent to the toe of Mound B, on the top of the cut bank over the lagoon beach (Fig. 19). The vertical face of this retreating bank showed that there were at least 3 feet of refuse at this spot. The Eskimo, who had been digging in the face of the bank, produced some Thule 2 harpoon heads that they said came from here.

Cut 2 was lowered to sterile earth, 37 inches below the surface, in six levels. These levels were begun in the 1931 season and finished in 1936.

Evidently the report of the Eskimo was correct. In Section 5, at the base of the midden, we found one Thule 2 harpoon head. Above this in Section 2 were five examples of Nunagiak barbed closed socket heads, a type that apparently developed out of the open socket form. It is very tempting to cite this as evidence of age difference. Fortunately, this is not the sole evidence on this point. Other artifacts from Cut 2 are listed below.

Mound B

Cut 2, Section 1

3 slate blades for harpoons
2 arrowpoints, chipped
1 slate knife blade, stemmed
1 walrus-rib pick
1 bone wedge
1 labret

Cut 2, Section 2

5 Nunagiak closed socket harpoon heads
2 arrowheads with single barb, spurred tang
1 slate blade for harpoon
1 toggle for seal poke
1 bow fragment
7 arrow fragments
1 arrowpoint, chipped
1 small arrowpoint
2 sled shoes
1 knife handle with slot in end
1 slate knife blade, stemmed
1 crooked knife
1 flint flaker point
1 bone wedge
1 ulu slate blade fragment
1 wound pin
1 flat comb

Cut 2, Section 3

1 Sicco open socket harpoon head
2 slate blades for harpoons
1 plug for seal poke
10 arrow fragments
1 arrowpoint, chipped
1 lance blade, chipped
1 single-edged slate blade knife
2 sidescrapers, chipped
1 wood oval bucket bottom
1 toy bow
2 toy arrows
1 drum rim
1 ornamental pin
— knots

Cut 2, Section 4

3 slate blades for harpoon
1 ice pick for harpoon
1 sinew wrench
12 arrow fragments
3 arrowpoints, chipped
2 small arrowpoints
1 dart shaft fragment
1 bolas ball
1 chipped ovate blade knife
1 chipped stemmed blade knife
1 slate blade knife, stemmed
1 plain sherd
1 chipped scraper, double-edged
5 ulu slate blade fragments
1 sidescraper, chipped
1 fragment of wooden spoon handle
1 toy bow
2 toy arrows
1 arrow blank

Cut 2, Section 5

1 Thule 2 open socket harpoon head
1 arrowhead without barbs, spurred tang
1 arrowhead with multiple unilateral barbs, spurred tang
2 arrowheads with single barb, spurred tang
2 slate blades for harpoon
1 harpoon socket piece
7 bow fragments
1 dart shaft fragment
1 salmon spear barb
1 knife handle with blade slot in end
1 walrus pick
3 plain sherds
1 chipped scraper, double-edged
2 endscraper blades

1 wood oval bucket bottom
1 bucket handle
1 bear canine, perforated
— human hair

Cut 2, Section 6

2 slate blades for harpoons
2 marlinspikes
1 arrow fragment
4 points, chipped
1 bird dart side prong
1 gorge hook
1 salmon spear barb
2 bolas balls
4 slate blade knives, stemmed
2 large slate blade knives
1 crooked knife
1 seal scratcher
1 snow-shovel handle
1 bone wedge
2 plain sherds
1 ulu blade fragment, reddish slate
4 endscraper blades
1 sidescraper, chipped
1 toy ulu blade fragment, reddish slate
2 pegs for staking hide
2 hanks of human hair

Cut 3

Cut 3 was laid out on the southern slope of Mound D, at one side of the entrance of the most recent house on the mound. The material from three of the four levels of this cut has been misplaced, so this excavation is not reported.

Cut 4

The Punuk style artifacts recovered by the Eskimo from the lagoon beach at Nunagiak are mentioned above. The locality was immediately to the east of the remnant of a house mound designated as C on the site map (Fig. 19). It appears that the structures in which the natives were mining in 1931 were originally at the base of Mound C. The lagoon was still cutting away the bank adjacent to the site, and, judging from the shape of Mound C, the major portion of the mound had already been removed.

In 1936 there was no competition from the Eskimo, so Cut 4, a rectangular area 8 by 14 feet, was laid out on the remnant of Mound C, adjacent to the bank cut by the waters of the lagoon, above the narrow beach where the Eskimo had worked in 1931. Three levels took this cut down 24 inches from the surface where timbers and posts were exposed, evidently connected with those projecting from the beach sand. A fourth level, 32 inches, began to expose timbers of structures that obviously were connected with the building remains that were visible and projected from the sandy beach. For this reason the excavation of arbitrary levels was abandoned. The excavated area was expanded to include the adjacent beach, and the material recovered was saved by what appeared to be units of building remains (Pl. 7).

The sand of the lagoon beach was only a few inches thick. Underlying it was typical black midden soil with a number of timbers and posts still in place (Fig. 20). Others undoubtedly had been removed by the Eskimo in the course of their digging mentioned above. Whatever the reason, this tangle of timbers is not easily interpreted. Cache A, exposed in Cut 4, was outlined by oil-soaked earth and masses of blubber; there was no wooden construction. The same is true of Cache B. Evidently these holes, dug from some undetermined level higher up in the midden, are of later date than the other constructions exposed in the beach. Structure C was a small hole lined with a few pieces of driftwood. Although labeled as a cache on the map, it is impossible to say whether this was actually its function. The unit marked D is evidently an entrance tunnel. All that remained of it were horizontal logs placed along the floor. These lay 8 inches below the water of the lagoon, about 4 inches above sea level. A number of artifacts were recovered from what appeared to be the earth floor of this tunnel. These are listed below; several items are illustrated in Fig. 21.

Best preserved was Structure E, a rectangular wooden floor, measuring 4 by 8 feet, with posts at the corners. Horizontal logs that bordered the floor were evidently the bases of the walls. The floor lay about 1 foot above the lagoon water (2 feet above sea level). It was not symmetrically arranged with the entrance tunnel, but was possibly a storage room that opened off the tunnel. It does not appear to have been large enough for the principal room of the house.

The main room of the house was possibly outlined by the posts and timbers designated as Structure F, by the posts labeled Structure G, and by the horizontal logs and posts that lay on the southern edge of the area marked Cache B.

Burial 1

In Structure F, apparently the northeast corner of the house, at an elevation of 1 foot

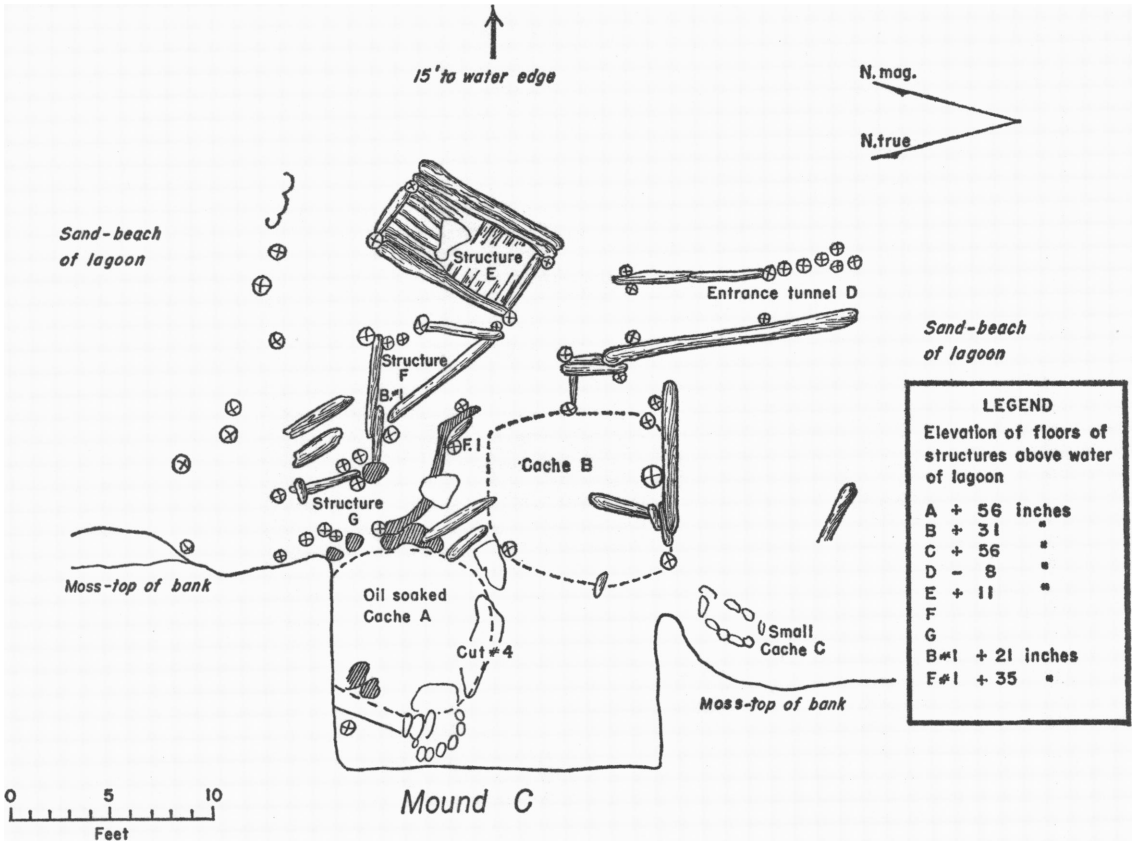


FIG. 20. Structures uncovered in the lagoon beach below Mound C, Nunagiak. This is the area from which the artifacts decorated in Punuk Style were obtained.

above the water of the lagoon, we found a human jaw and a rib lying on fragments of polar bearskin. Accompanying these was one complete arrow (Fig. 22), fragments of arrowshafts, and three detached antler points (Fig. 59c). These heads were of the knobbed tang variety: two with slots for inserted stone blades, and two with single barbs. A toy arrow without a head and flared at the butt end to simulate feathering (Fig. 21a), a beamer (Fig. 21b), and two complete ulus (Fig. 21c–d) were also found.

FIND NO. 1

Another cache of artifacts, found not far distant on the same level, was designated as Find 1, although a human jaw and scattered bone fragments suggest that these artifacts accompanied a second burial. The items recovered here (Fig. 21e–j) include a bowdrill spindle, an unidentified curved wooden object capped with an ivory tip, a decorated inflation plug for the seal poke, a short, double-edged slate knife blade, decorated snow goggles, and the complete handle of a composite knife.

ARTIFACTS FROM STRUCTURES BELOW MOUND C

The floor levels of the structures below Mound C and under the beach sand yielded a rather representative sample of artifacts. Most of these are listed in the tabulations below. The few objects decorated in the Punuk style are omitted from this tabulation because they do not conform to the typology set up for the Point Barrow Area. These are illustrated in Fig. 21k–p.

The harpoon head found in the area of Find 1 (Fig. 21k) is particularly worthy of note. It conforms to Collins' Type III(a)x,[1] a form especially characteristic of the Punuk Period on St. Lawrence Island. This specimen, made of ivory, has the sharp angles and flattened facets that

[1] Collins, 1937, 118–120.

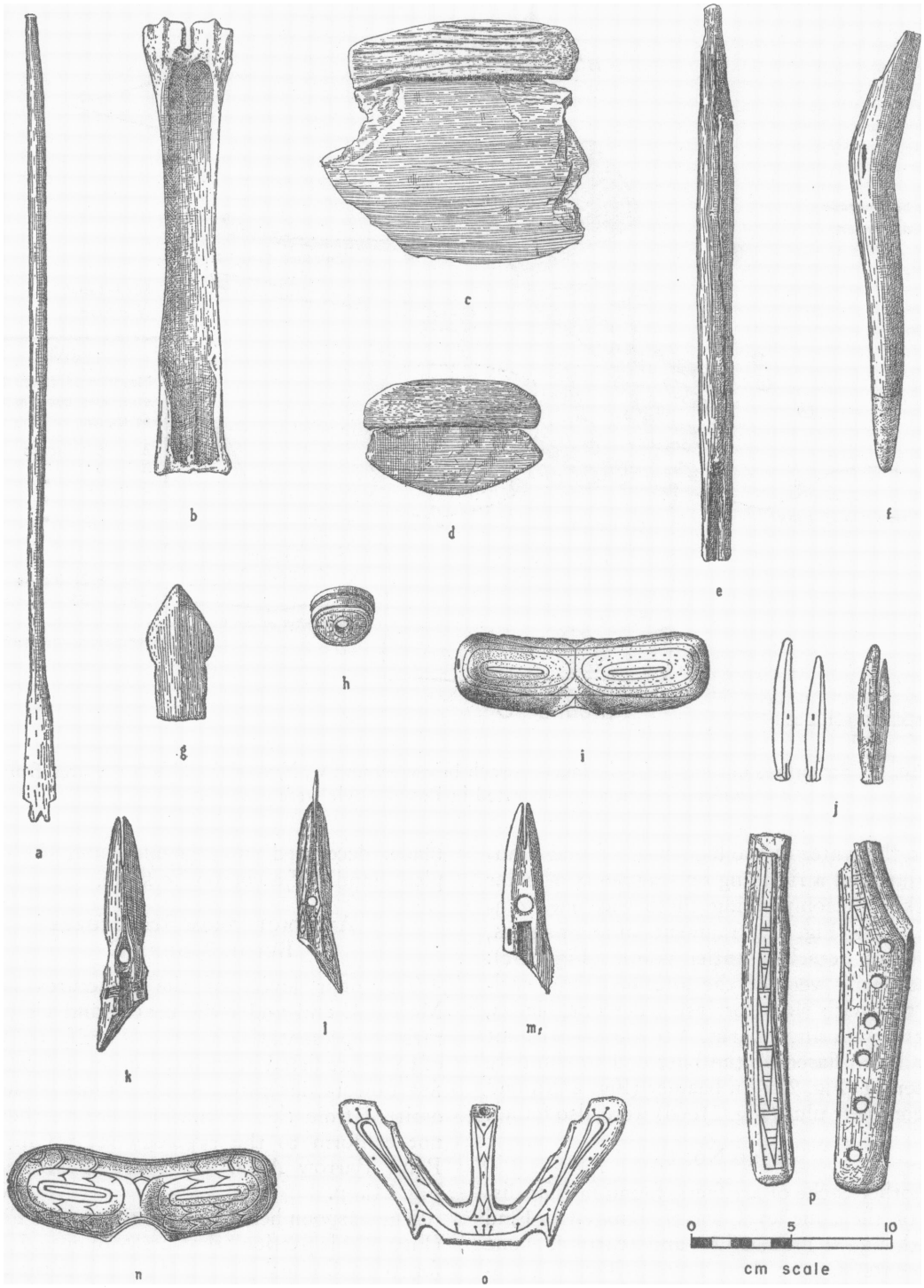


FIG. 21. Artifacts from the structures beneath Mound C, Nunagiak, and from the adjacent beach of the lagoon. a. Wood arrowshaft. b. Beaming tool. c–d. Slate ulus with wood handles. e. Bowdrill spindle. f. Unidentified. g. Slate knife blade. h. Inflation nozzle for float. i, n. Snow goggles made of ivory. j. Composite knife handle. k–m. Harpoon heads. o. "Winged" object. p. Blubber hook.

are a Punuk feature. However, it does not have the decoration found on many of the harpoon heads from the Bering Strait Region.

The harpoon head (Fig. 21 l) given to me by Evans, then the school teacher at Wainwright, was the artifact that focused my attention on the Nunagiak Site. It is a closed socket harpoon head made of ivory, bearing typical Punuk style decoration, and conforms exactly to Collins' Type Vx.[1] The decoration consists of the delicately incised line-and-dot design that characterizes the early portion of the Punuk Period, as found in the later deposits at the Miyowagh Site at Gambell on St. Lawrence Island.

The third Punuk style harpoon head from Nunagiak (Fig. 21m) was purchased from an Eskimo who said that it came from the locality on the lagoon beach. This ivory, open socket point is undecorated and conforms to Collins' Type III(a)x[2] in all respects.

The ivory snow goggles illustrated in Fig. 21i have incised decoration that cannot be placed exactly as to style. Possibly the reason is that similar decorated goggles have not been illustrated from the Bering Strait Region. The small excised areas at the juncture of the lines, the spurred lines, the dashed lines paralleling solid lines, and the filling of the incisions with red pigment all suggest Punuk Period relationships, possibly early in that period. This specimen was a part of Find 1.

The ivory goggles (Fig. 21n) were purchased in 1931 from an Eskimo who had just dug them from the beach below Mound C. The incised design differs in detail from that on the goggles described above, and no exactly comparable design can be cited.

No such uncertainty surrounds the identification of the ivory winged object illustrated in Fig. 21o. This is a typical Early Punuk Period trident. It has a rectangular socket at the base, with drilled holes leading into the socket from the back and from each side. Collins has designated the incised decoration as Punuk Style 2. There is a generalized resemblance to the tridents illustrated from Ievoghiyok by Collins,[3] but almost exact identity is found on a speci-

[1] Collins, 1937, 110, Pl. 28, Figs. 19–22.

[2] Collins, 1937, 203–205, Pl. 70, Figs. 8–15; also Geist and Rainey, 1936, Pl. 67, Figs. 1–5.

[3] Collins, 1937, Pl. 68, Figs. 1–5; for discussion, see 197–200.

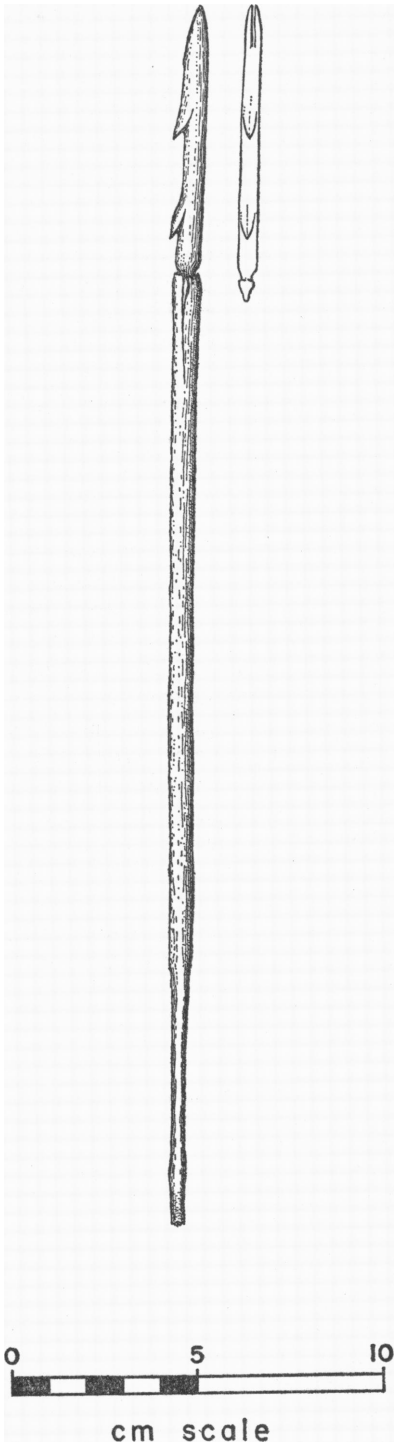


FIG. 22. Complete arrow from Burial 1, Structure F, below Mound C, Nunagiak. (For location, see Fig. 20.)

men from Punuk Island.[1] The rectangular socket, the shape of the wings, and the style of the decoration suggest that this object was made early in the Punuk Period.

The material, form, and decoration of the ivory blubber hook (Fig. 21p) identify it as typical of the Punuk Period. It corresponds in form to Collins' Type 4.[2] The two examples of this type from the series of sites at Gambell came from the Early Punuk Period deposits in the Miyowagh Midden. The decoration on this hook conforms to Collins' Punuk Style 2, although I am not sure to which phase of this style it should be assigned. It resembles most clearly artifacts illustrated by Collins.[3] As a group, these straight-line designs were emphasized late in the Punuk Period on St. Lawrence Island.

The artifacts just described contrast rather markedly with the usually undecorated artifacts of antler and bone that are characteristic of the Birnirk and later cultural stages of the Point Barrow Region. The resemblances to Punuk Period artifacts from St. Lawrence Island are most striking. Too many identifiable objects of Punuk type came from this one locality in the Nunagiak Site for this to be an example of simple trade. It appears more likely that the deposit at the base of Mound C represents the dwelling of an Eskimo family who, in the Punuk Period, emigrated either from St. Lawrence Island or from the Chukchi Peninsula where art and artifact forms were very similar.[4]

Mound C

Cut 4, Section 1

2 Thule 2 open socket harpoon heads
1 Natchuk open socket harpoon head
1 arrowhead with barb and stones
1 arrowhead with multiple unilateral barbs, straight tang
1 slate blade for harpoon
2 small points
4 chipped ovate blade knives
1 plain sherd
2 sidescrapers, chipped
1 endscraper blade
1 bucket handle
1 flat comb

Cut 4, Section 2

2 slate blades for harpoon
1 sinew wrench
1 bolas ball
1 whale-rib mattock
1 plain sherd
2 ulu slate blade fragments
1 sidescraper, chipped
1 bear canine, perforated
1 hank of human hair

Cut 4, Section 3

1 arrow fragment
1 sled shoe
1 composite engraving-knife handle
1 knife handle with blade slot in end
2 slate blade knives, stemmed
2 plain sherds
2 ulu slate blade fragments
1 toy bow

Cut 4, Section 4

1 arrowhead with single barb, straight tang
1 plug for seal poke
1 socket piece for harpoon
1 chipped point
1 fish spearpoint
1 chipped knife blade, stemmed
1 slate blade knife, stemmed
1 fire-making spindle
1 plain sherd
1 endscraper blade
1 bucket handle
1 hank of human hair
— bird snares

Cache A

2 bone wedges
1 plain sherd
1 ulu handle
2 ulu slate blade fragments
1 oval wood bucket bottom
1 knot

Cache B

1 slate blade for harpoon
1 stone point for lance
1 arrow fragment
1 fish spearpoint
1 oval wood bucket bottom
1 antler strip, possibly kayak rib

Entrance D

1 arrowhead with single barb, spurred tang
1 arrowhead with multiple unilateral barbs, straight tang
1 arrowhead with opposing barbs, straight tang
2 slate blades for harpoons

[1] Collins, 1929, Pl. 10a–b.
[2] Collins, 1937, 139, Pl. 35, Fig. 6.
[3] Collins, 1937, Pl. 65, Figs. 9–11, Pl. 66, Fig. 6.
[4] Machinskii, 1941; Rudenko, 1947.

1 foreshaft for harpoon
1 set of detachable lance and stone point for lance
1 deer lance shaft
1 finger rest for harpoon
2 bow fragments
1 marlinspike
5 arrowshaft fragments
1 dart shaft fragment
1 chipped point
1 atlatl
1 side prong for dart
1 antler stanchion for sled
1 kayak bailer
1 salmon spear barb
1 antler rim for ice scoop
1 wound plug
2 bolas balls
2 net floats
2 knife handles with blade slot in end
1 large blade, chipped
1 spindle for bowdrill
1 scapula shovel with handle
1 root pick handle
2 whale-rib mattocks

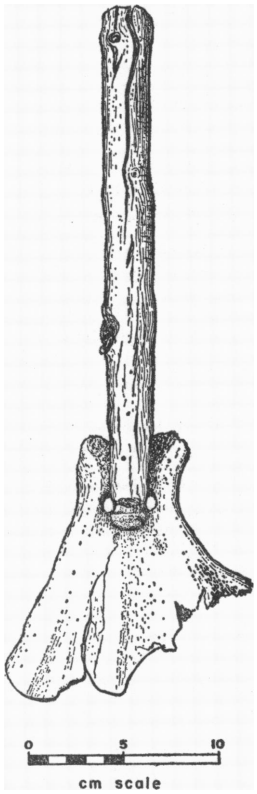


FIG. 23. Scapula snow shovel with handle, found in Entrance D, in the beach sands below the eroding Mound C, Nunagiak.

2 walrus-rib picks
1 bone wedge
1 lamp fragment, pottery
2 plain sherds
1 cup-shaped fat scraper
1 baleen bucket side wall
4 oval wood bucket bottoms
1 toy oval wood bucket bottom
2 horn spoons
1 blubber pounder
1 needle case
1 boot, Birnirk type
3 toy arrows
1 toy baleen knife
2 baleen drum rims
2 baleen snare stakes
1 baleen cross
1 baleen toboggan
1 bear canine, grooved
2 birchbark rolls
1 antler rib, possibly kayak rib
— bird snares
— knots

STRUCTURE E

1 arrowhead with unilateral barbs, knobbed tang
1 arrow fragment
1 bolas ball
1 composite engraving-knife handle
1 knife handle with blade slot in end
1 sidescraper, chipped
1 ulu slate blade fragment
1 two-piece ice scoop
1 toy spoon
4 toy arrows
1 bird snare

BURIAL 1

2 arrowheads with barbs and stone blade, knobbed tang
2 arrowheads with unilateral barbs, knobbed tang
1 slate blade for harpoon
1 shaft for harpoon
1 arrow, complete
3 arrow fragments
2 dart shaft fragments
2 complete ulu handles
1 ulu slate blade fragment
1 beamer of deer metapodial
1 toy arrow

FIND 1

1 arrowhead with unilateral barbs, knobbed tang
1 unidentified wooden object
1 pair ivory snow goggles, decorated
1 ice pick for harpoon
1 plug for seal poke
5 dart shaft fragments

1 kayak frame
2 complete ulus
1 complete composite engraving knife
1 chipped ovate blade
1 slate blade, stemmed
1 short double-edged slate knife blade
1 bone spindle point for bowdrill
2 pegs for staking hides

ABOVE PUNUK HOUSE

3 slate blades for harpoons
2 toggles for seal pokes
1 bow fragment
7 arrow fragments
1 point, chipped
2 dart shaft fragments
1 atlatl dart butt piece
1 antler stanchion for sled
1 sled shoe
1 fish spearpoint
1 antler rimmed ice scoop
1 bolas ball
1 chipped ovate blade
1 chipped stemmed blade
1 slate blade, stemmed
1 adze blade for bone
1 adze blade for wood
3 whale-rib mattocks
1 bone wedge
2 ulu slate blade fragments
6 plain sherds
2 double-edged scrapers, chipped
1 oval wood bucket bottom
2 pegs for staking hides
1 toy baleen bow
1 toy wooden bow
1 knot
1 hank of human hair
1 antler rib, possibly kayak rib

PUNUK HOUSE

2 Thule 2 open socket harpoon heads
1 Sicco open socket harpoon head
1 Natchuk open socket harpoon head
1 arrowhead with barbs and stone blade, knobbed tang
1 arrowhead with unilateral barbs, knobbed tang
2 arrowheads with multiple unilateral barbs, knobbed tang
5 bolas balls
1 foreshaft for harpoon
1 socket piece for harpoon
2 chipped stemmed blades
2 large slate blades
1 netting shuttle

MISCELLANEOUS ARTIFACTS FROM BEACH

4 slate blades for harpoons
1 spindle shaft for harpoon
1 dart shaft fragment
1 antler rim for ice scoop
2 bolas balls
1 chipped blade, stemmed
1 adze blade for bone
1 adze blade for wood
2 whetstones
2 bone wedges
1 endscraper blade
1 oval wood bucket bottom
1 toy arrow
1 toy bow
1 bear canine, grooved
1 swivel for dog harness

DATE OF THE HOUSES BELOW MOUND C IN TERMS OF THE CHRONOLOGY OF THE POINT BARROW AREA

If the interpretation is correct that the building remains below Mound C were occupied by Eskimo having a Punuk type of culture, an interesting opportunity is offered to determine the time position of Punuk in relation to the chronology at Point Barrow. Three harpoon heads were obtained from Cut 4, immediately above these structures. Two of these were of Thule 2 Type, and one conformed to the type called Natchuk. Four more harpoon heads were recovered from among the timbers that lay near the level of the lagoon water. Two of these were of Thule 2 Type, one was of the type named Sicco, and one was Natchuk. Owing to the conditions under which these last four heads were recovered, it is impossible to be certain whether they were directly associated with the artifacts of Punuk Type, or had been washed out of the half-eroded Mound C and were buried in the beach by water action. At best, these heads suggest an upper limit for the Punuk style artifacts; they cannot be later than the cultural dates suggested by Thule 2, Sicco, and Natchuk types of harpoon heads.

CUT 5

As Cut 1 was found to be seriously disturbed when I returned to Nunagiak in 1936, Cut 5 was laid out alongside Cut 1 on the flank of Mound A. However, owing to the pressure of work in other parts of the site, only two levels of this cut were excavated. The meager results are not tabulated.

Mound H, Cut 6

In 1936 Cut 6 was marked out on the southern slope of the large mound designated as Mound H. The refuse at this point was obviously recent, originating from the several houses built on the top of the mound. I planned to cut through this in the hope of obtaining more details on the later phases of the chronology at Nunagiak. However, the thaw was so slow that only two arbitrary levels were dug in this cut. Both yielded European artifacts, iron, and bullets. The material recovered is listed below.

Cut 6, Section 1

1 ice pick for harpoon
1 toggle for seal poke
2 bow fragments
3 sled shoes
1 knife handle with blade slot in end
4 crude ovate chipped blades
3 chipped stone drill points
1 shovel edge of antler
2 adze socket pieces
1 lamp fragment, soapstone
1 plain sherd
1 dog canine, perforated
1 bear canine, perforated
1 bullet
1 trinket box
1 iron blade

Cut 6, Section 2

1 slate blade for harpoon
3 arrow fragments
1 sled shoe
2 kayak frame parts (?)
1 adze socket piece
1 engraving tool
1 plain sherd
1 ulu slate blade fragment
2 chipped sidescrapers
1 oval wood bucket bottom

EXCAVATIONS AT UTKIAVIK

Inspired by my presence, several Eskimo of the Utkiavik Village spent the summer of 1932 rooting in the abandoned houses on the southern side of the village. These house ruins and refuse deposits range from contact date, demonstrated by included iron and glass, to the Thule Period. This was indicated by five harpoon heads of the typical Thule 2 Type. The collections were purchased for me by Charles Brower, in exactly the same fashion as he had purchased specimens for Stefánsson in 1912. The material accumulated in this way is the "purchased" collection from Utkiavik.

Cut 1, House A

In order to acquire some systematic information, I undertook limited excavations at Utkiavik. Particularly intriguing were the Thule 2 Type of harpoon heads the Eskimo found on the bluff to the south side of the Kugok ravine (Fig. 6). This locality is called "Ok-kok-suk." A low mound with a shallow depression in it that suggested a house pit was selected as the site for Cut 1, an excavation 12 feet square. Two levels, at a depth of 1 foot, revealed fragments of house timbers; what was first thought to be the roof later turned out to be the floor. An unfinished harpoon head of Thule 2 Type was found immediately over the floor, but this probably was brought in with the sod and earth used to cover the roof. It cannot be considered as providing a date for the structure. No European material was recovered from the soil above the house, and this fact may be accepted as evidence of a pre-contact date.

After it had been abandoned, House A had been extensively robbed of timbers. All the roof timbers, much of the floor, and most of the wall timbers had been salvaged, doubtless to be used in other structures. However, it is obvious that this house was of the Point Barrow type. The building had been rectangular, 17 by 12 feet, with the entrance tunnel extending towards the south from the middle of one long side (Fig. 24). The floor puncheons, 6 to 10 inches wide, hewn to a thickness of about 2 inches, had been laid side by side, extending the long way of the house. Small fragments of wood and chips had been placed beneath the floor boards for insulation. To increase protection from the frozen ground small pegs had been driven through cracks and knot holes. Stumps of three of the four corner posts were in place, but there was no indication of the large posts that had supported the ridgepole at each end of the house. The chopped-off ends of the wall timbers buried around the edge of the floor showed that these elements had been placed vertically.

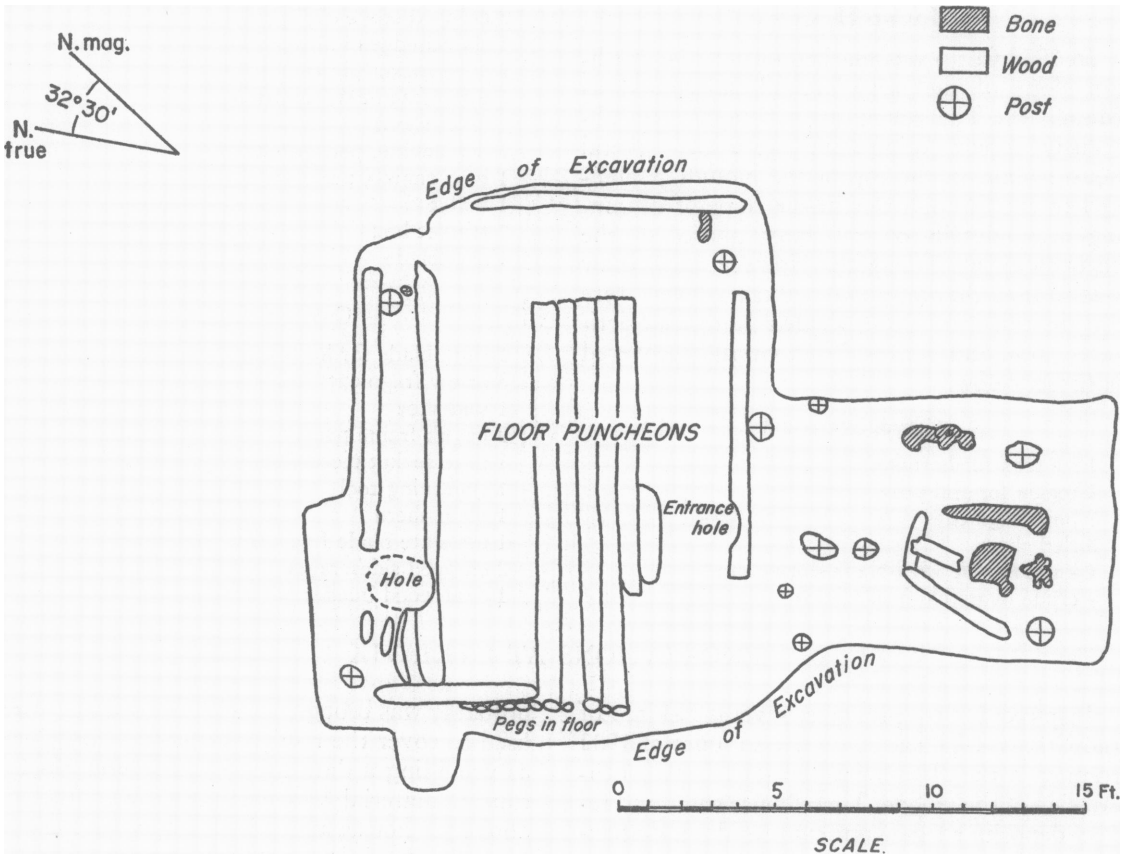


FIG. 24. Plan of House A, Utkiavik Site. Logs are unshaded; whale bones are shaded.

The entrance tunnel also had been wrecked and, from what remains, about all that can be said is that it extended at least 9 feet to the south and that a whale jaw, scapula, skull, and wooden beams had been used in its construction.

No clearly defined entrance tunnel floor could be found, but it was clear that it had been well below the floor of the house. Entrance into the building was through a hole in the floor in typical Point Barrow fashion; one of the puncheons had cut into it a well-worn segment of an oval hole.

After House A was mapped, the excavation was continued below the floor to a total depth of 20 inches, the base of cultural deposits, in the hope of finding material of the Nunagiak, or Thule, period. This hope was not realized.

ABOVE ENTRANCE OF HOUSE A

4 ice picks for harpoons
2 small arrowpoints, chipped
1 side prong for dart, Utkiavik type
1 bladder dart socket piece
16 bone sled shoes
4 crooked knives
5 bolas balls
1 one-piece snow goggles
4 simple bone points
2 bolas balls of seal astragalus
3 knife handles with blade slot in end
4 composite engraving-knife handles
1 large two-handed knife
1 bowdrill mouthpiece of antler
4 shovel edges of antler
1 handle, unfinished
1 socket piece
1 whale-rib mattock
3 walrus-rib picks
3 bone wedges
3 lamp fragments
4 plain sherds
1 ulu handle
1 flint endscraper blade
1 wooden ladle

2 walrus teeth, grooved
1 snow probe
1 seal dart point
1 antler hook
1 line toggle
1 ornamental ivory plug for wooden dish
1 flat comb

Above House A
Cut 1, Sections 1 and 2

1 Utkiavik closed socket harpoon head
2 Thule 2 open socket harpoon heads
2 arrow blanks, spurred tang
2 arrowheads without barbs, spurred tang
5 slate blades for harpoons
1 foreshaft for harpoon (whale)
1 ice pick for harpoon
2 toggles for seal poke
2 bow splice reënforcements
2 bow fragments
3 marlinspikes
1 sinew wrench
10 arrow fragments
8 small chipped arrowpoints
1 bird dart point
1 gun flint
1 bladder dart socket piece
1 bladder dart inflation nozzle
13 bone sled shoes
1 baleen sled shoe
4 double-edged slate blades
1 kayak part, fragment
4 crooked knives
1 two-piece snow goggles
1 simple bone point
1 fish spearpoint
1 fish spear shaft
5 ribs cut for bolas balls
2 bolas balls of seal astragalus
1 composite engraving-knife handle
2 knife handles with blade slot in end
1 ovate chipped knife blade
1 chipped stemmed blade
4 short chipped stemmed blades
1 large two-handed knife
2 stone drill points
1 bowdrill mouthpiece, deer astragalus
2 spindles for bone drills
2 shovel edges of antler
2 snowknives
2 adze handles
4 adze socket pieces
2 adze blades for bone
1 adze blade for wood
1 whalebone shave
2 whale-rib mattocks
4 walrus-rib picks
1 whetstone
2 flint flaker points
3 blubber hooks
27 bone wedges
1 lamp fragment, stone
1 lamp fragment, pottery
21 plain sherds
2 boot creasers
13 ulu slate blade fragments
2 endscraper blades
2 sidescrapers, chipped
1 oval wood bucket bottom
2 beamers of deer metapodial
1 bucket handle
1 bladder dart inflation nozzle
4 two-piece spoons
3 bone awls
3 wound pins
1 needle case
3 pegs for staking hides
1 labret
1 slat armor
1 boot, modern type
1 knife for squeezing water
1 brow band
1 flat comb
1 doll of bark
1 toy adze blade
1 toy bow
1 baleen ring
1 chipped stone whale effigy
1 baleen cross (off center)
3 baleen knots
2 bear canines, perforated

Floor of House A

1 Nuwuk closed socket harpoon head
2 Brower closed socket harpoon heads
2 Kilimatavik closed socket harpoon heads
2 arrowheads with blunt points, spurred tang
1 arrowhead with single barbed notched points, spurred tang
5 arrowheads with single barb, spurred tang
2 arrowheads, long serrated, knobbed tang
2 arrowheads with unilateral barbs, knobbed tang
3 slate blades for harpoons
2 ice picks for harpoons
1 wood toggle for seal poke
1 bow splice reënforcement
2 bow fragments
1 sinew wrench
9 arrow fragments
6 chipped arrowpoints, small
1 bird dart point
2 bone sled shoes
1 tomcod hook
1 canoe paddle
2 simple bone points
1 bolas ball

1 composite engraving-knife handle
1 chipped knife blade, stemmed
2 short chipped knife blades, stemmed
4 stone drill points
1 spindle for bowdrill
2 shovel edges of antler
2 flint flaker points
4 bone wedges
1 lamp fragment
9 plain sherds
3 ulu slate blade fragments
1 endscraper blade
1 bucket side wall of wood
1 blubber pounder
1 bone awl
8 pegs for staking hides
1 toy lamp
1 wood toy bow
1 fish net, baleen
1 baleen toboggan
1 antler strip, possibly kayak rib
1 bear canine, perforated

Below Floor of House A

1 foreshaft for harpoon
1 arrow fragment
1 wound plug
1 spindle for bowdrill
1 baleen bucket side wall
1 oval wood bucket bottom
1 wood ladle
1 horn ladle
1 inserted bird bone
1 baleen knot
2 toy arrows
1 ring for drying rack
1 four-strand plaited baleen object

Cut 2

Thule 2 harpoon heads have been found on the point of the bluff on the north side of the mouth of the Kugok ravine by Eskimo diggers. Cut 2 was a 12-foot-square excavation in the refuse pile at the end of the entrance to a house where one of my workmen, Floyd Avokana, had visited as a boy. This would place the abandonment of the house at about 1900 A.D. Six arbitrary levels carried this excavation to the base of the deposit at a depth of 44 inches. Trade material was found to the base of this deposit.

Cut 2, Section 1

1 Cape Smythe closed socket harpoon head
1 arrow blank, spurred tang
1 arrowhead with multiple unilateral barbs, spurred tang
1 arrowhead with single barb, spurred tang
1 ice pick for harpoon
1 finger rest for harpoon
1 toggle for seal poke
1 inflation plug for seal poke
1 fish stringing needle
3 men's single-edged slate knives
1 bladder dart socket piece
1 bladder dart inflation nozzle
2 double-edged slate blades
2 crooked knives
1 knife handle with blade slot in end
1 shovel edge of antler
1 chipped stemmed blade
1 adze socket piece
1 blubber hook
1 boot creaser
4 ulu slate blade fragments
1 baleen bucket side wall
1 bladder dart inflation nozzle
2 needle cases
1 peg for staking hides
2 labrets
1 ivory fish effigy
1 drum splice
4 drum handles
1 snow probe
1 dragline handle
1 man's slate knife blade
— glass beads
— iron

Cut 2, Section 2

3 wood toggles for seal pokes
2 arrow fragments
1 small chipped arrowpoint
1 double-edged slate blade
1 kayak part
1 fish spearpoint
2 bolas balls
1 slate adze blade for wood
1 lamp fragment, stone
1 sherd, decorated
3 ulu slate blade fragments
1 two-piece spoon
1 bone awl
3 pegs for staking hides
— European materials

Cut 2, Section 3

1 bow fragment
1 bone sled shoe
1 sinker net weight
1 large two-handed knife
1 bone wedge
3 plain sherds
1 ulu slate blade fragment
2 flat splice reënforcements
— European materials

CUT 2, SECTION 4

1 arrowhead without barbs, spurred tang
5 trade beads
1 ivory comb
1 small ivory doll head of walrus
1 ivory needle case, iron needle in leather strip inside
1 ivory harpoon socket
1 fragment of European cloth
1 man's slate knife blade
1 chipped flint projectile point
1 chipped flint knife
1 fragment of chipped flint
1 pyrites pebble for strike-a-light
1 bone drill point for bow
1 bone arrowhead
1 iron knife in wood handle
1 wood splicing reënforcement
1 half of wood mask

CUT 2, SECTION 5

1 arrowhead with single barb, spurred tang
1 slate blade for harpoon
1 ice pick for harpoon
1 bow splice
3 arrow fragments
1 fish stringing needle
1 knife handle with blade slot in end
1 shovel edge of antler
3 plain sherds
1 ulu slate blade fragment
1 oval wood bucket bottom
1 two-piece ice scoop
1 slat armor
1 wood drum rim
1 fish net fragment, baleen
2 pegs for staking hides
1 fragment of a hide boat cover
1 bone wedge

CUT 2, SECTION 6

1 arrow blank
1 bow fragment
1 bone sled shoe
1 knife handle with blade slot in end
1 adze blade for bone, fragment
1 wood mattock handle
1 plain sherd
2 fish net fragments
1 baleen cross
1 baleen lashing
— European material

LOCATION X AND CUTS 3 AND 4

While I was engaged in excavating House A at Utkiavik, the Eskimo diggers were concentrating in a small area on the southern edge of the old village. On the map (Fig. 6), this is listed as Loc. X. I purchased from the diggers the collection obtained here. Superficially, this appeared to be an area of rich midden deposit, so later two cuts were laid out on each side of the spot where the Eskimo had been working. These, listed as Utkiavik Cuts 3 and 4, showed that the refuse did not extend over 12 inches in depth, and, as far as could be seen, there was no cultural change. The artifacts recovered from these pits are listed below.

LOCATION X, PURCHASE

3 ice picks for harpoons
1 small chipped arrowpoint
1 shuttle
4 crooked knives
3 bolas balls
1 arrowshaft wrench
1 composite engraving-knife handle
1 knife handle with blade slot in end
1 shovel edge of antler
1 flint flaker point and handle
1 complete pot, decorated
1 ulu slate blade fragment
1 endscraper blade
1 cup-shaped fat scraper of horn
1 endscraper handle of wood
2 needle cases
1 labret
1 toy sled runner
1 toy kayak
1 wood drum handle
2 baleen crosses
1 snow probe
2 seal killer club stones

CUT 3

1 arrowhead with single barb, spurred tang
2 sherds
2 wooden labrets (one mended)
1 wood splicing reënforcement
1 wood dipper handle
1 iron powder flask
1 unidentified iron, 7½ inches
— baleen knots

CUT 4

1 Cape Smythe closed socket harpoon head
2 ice picks for harpoons
1 toggle for seal poke
1 arrowshaft straightener
1 bow splice
1 small chipped arrowpoint
1 bone sled shovel
1 double-edged slate blade
1 crooked knife
1 composite engraving-knife handle

1 whale-rib mattock
1 blubber hook
2 plain sherds
1 ulu handle
1 ulu slate blade fragment
1 sidescraper, chipped
1 oval baleen bucket bottom
1 needle case
2 labrets
1 flat splice reënforcement
1 knife for squeezing water
1 flat comb
2 slat armor
1 toy arrow
1 fish net
2 thimble holders

House B

Our excavations in Utkiavik Village not only inspired our Eskimo competitors to greater efforts, but also in at least one case caused an improvement in their technique. Two young men, Jerry Powyurak and Carl Tylook, undertook the cleaning out of an old house near the bluff. They had the job half completed before I became aware of their work. Some of the old people told us that before Charles Brower came to Barrow (that is, before 1890) two old women, named Ká-le-owk and Paw-wak, lived in this house. Because they had no man to provide food for them, they had starved to death during a winter of scarcity. Apparently the story is true, for when the roof beams were removed the partially desiccated and frozen bodies of two women lying on a polar bearskin were uncovered. They had fallen when the sleeping platform in the back side of the house had collapsed (Fig. 25).

House B was a rather small structure, 12 feet 4 inches long by 7 feet 4 inches wide. The entrance hole was in the center of the short side of the house, and the tunnel led towards the south. The flat-hewn floor boards which extended across the structure were held down at the ends by logs hewn square, 4 inches on a side. The upright wall planks, 3 feet 6 inches high, rested against these tie pieces. Inside the tie pieces

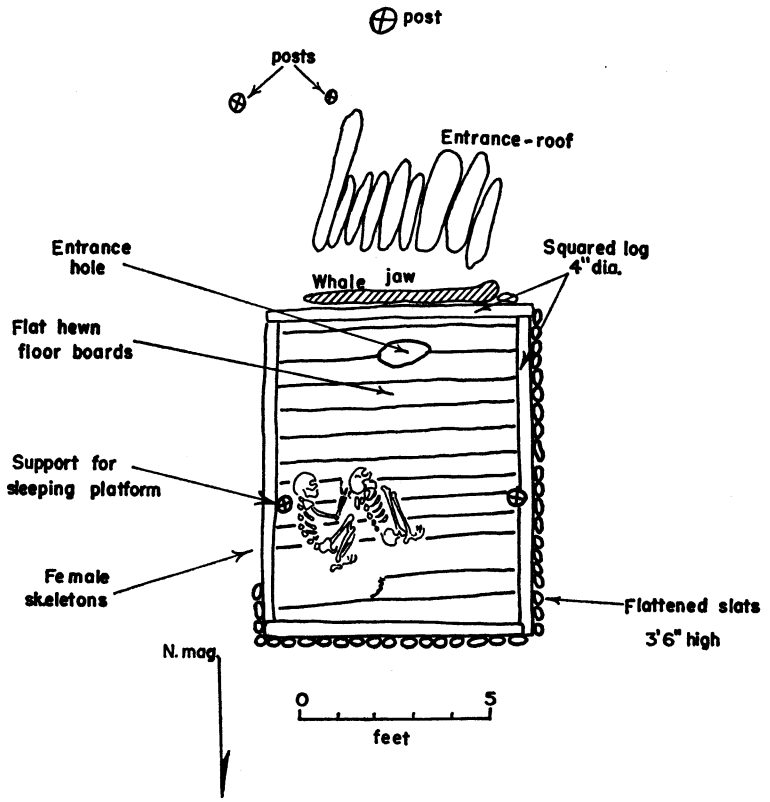


Fig. 25. Plan of House B, Utkiavik Site.

were posts to support the sleeping platform 5 feet 6 inches from the back wall.

The oval entrance hole, towards the front of the house, was about 18 inches long. The Eskimo excavators uncovered the roof timbers of the entrance tunnel, but did not dig to the floor. At my instruction they carefully isolated the items that lay on the floor of the house, and the collection is listed below.

Floor Deposit of House B

1 Utkiavik closed socket harpoon head
1 Nunagiak closed socket harpoon head
1 arrow blank, spurred tang
1 arrowhead with barbs and stone, spurred tang
1 arrowhead with multiple unilateral barbs, spurred tang
1 arrowhead, long, serrated, knobbed tang
3 slate blades for harpoons
2 foreshafts for harpoons
2 ice picks for harpoons
1 wood toggle for seal poke
1 bow splice reënforcement
1 bow fragment
1 sinew wrench
2 arrow fragments
3 small chipped arrowpoints
1 wrist guard
1 fish-stringing needle
1 side prong, Utkiavik type
2 men's single-edged slate knives
2 bladder dart socket pieces
2 bone sled shoes
2 double-edged slate blades
5 kayak parts
2 shuttles
1 tomcod hook
1 crooked knife
1 fish spearpoint
1 sinker, net weight
30 bolas balls of seal astragalus
1 composite engraving knife
1 bowdrill spindle
3 shovel edges of antler
1 adze socket piece with iron blade
1 jade adze blade for wood
1 iron adze blade
1 whetstone
2 flint flaker handles
2 plain sherds
1 ulu handle with iron blade
1 ulu slate blade fragment
5 endscraper blades
1 disc scraper, chipped
1 baleen bucket side wall
2 wood bucket side walls
1 bucket handle
3 two-piece ice scoops
1 ladle of loon or duck sternum
1 bead for labret
2 awls of antler
3 labrets
1 flat comb
1 tubular comb
1 toy pick, complete
1 baleen toy bow
1 drum rim
1 drinking tube
1 dog harness swivel
1 snow probe
1 top

NUWUK

The collection from the old houses at the village of Nuwuk, the northernmost point of the North American mainland (Fig. 1), was excavated by Eskimo and purchased for me by Charles Brower. Both this material and a superficial examination of the locality suggest that Nuwuk was settled slightly later than Utkiavik; no harpoon heads as old as Thule 2 have come from here. The material obtained is listed below:

12 Nuwuk closed socket harpoon heads
1 Barrow closed socket harpoon head
5 Kuk closed socket harpoon heads
3 Kilimatavik closed socket harpoon heads
1 Nunagiak closed socket harpoon head
15 blunt arrowpoints
9 arrow blanks
2 arrowheads without barbs, spurred tang
10 arrowheads with barbs and stone, spurred tang
6 arrowheads with multiple unilateral barbs, spurred tang
1 arrowhead with single notched point and barbs, spurred tang
18 arrowheads with single barb point, spurred tang
5 sinew twisters
36 slate blades for harpoons
1 blade box for harpoon
3 ice picks for harpoons
1 plug for seal poke
5 bow splice reënforcements
1 bow fragment
7 arrow fragments
32 small chipped arrowpoints
1 pair of seal rattles

5 fish-stringing needles
9 bladder dart socket pieces
2 bladder inflation nozzles
2 bottom crosspieces for umiak
1 ice scraper for umiak
12 double-edged slate blades
1 kayak part
1 kayak bailer
11 tomcod hooks
26 crooked knives
6 simple bone points
4 net sinkers, weights
2 wood net floats
1 net gauge
2 antler rims for ice scoops
24 small bolas balls
1 large bolas ball
2 bolas balls of seal astragalus
15 composite engraving-knife handles
29 knife handles with blade slot in end
1 large two-handed knife
22 shovel edges of antler
3 snowknives
1 adze handle
6 adze socket pieces
3 whalebone shaves
7 whale-rib mattocks
3 walrus-rib picks
11 flint flaker points
2 flint flaker handle fragments
1 blubber hook
4 bone wedges
1 engraving tool
1 lamp fragment, soapstone
1 lamp fragment, stone
1 boot creaser
12 ulu handles
75 ulu slate blade fragments
25 endscraper blades
1 cup-shaped fat scraper
1 oval wood bucket bottom
2 bladder dart inflation nozzles
1 small wood meat dish
5 two-piece ice scoops
1 blubber pounder
5 needle cases
1 full needle case
21 labrets
4 flat combs
1 toy lamp of steatite
1 wood doll head
1 toy umiak
1 toy bow
1 toy harpoon foreshaft
1 drum rim splice
1 baleen dog-line swivel
1 line toggle
2 snow probes
16 thimble holders
1 pipe
1 gunflint
1 saw of sandstone

ARTIFACTS

IN THE FOREGOING PAGES, the excavations are described, and the artifacts from each excavation unit are listed. In this section the finds are described and the passage of time is traced. Finally, I draw whatever conclusions remain after considering the skillful deductions that Mathiassen, Collins, Larsen, and Giddings have been able to make from their respective researches; few are left.

The lengthy artifact inventory with which any report on Eskimo archeology must deal makes organization a serious problem. If materials are described according to provenience, there is considerable repetition, for duplication occurs when the artifacts are considered in sequence. In his paper on the Kobuk River sites, Giddings has evolved what seems to me the best pattern for such reports, and, in general, I try to follow his example.

HUNTING EQUIPMENT

HARPOON PARTS

HARPOON HEADS

Harpoon heads are here classified into types paralleling as closely as possible the classifications set up by Mathiassen for Central Canada and by Collins for the Bering Strait Region. Type groups are referred to by names rather than by a system of numbers or letters. I have attempted to establish rather definitive and "tight" definitions for the harpoon head types, for subtle distinctions seem to have chronological and areal significance. For example, Mathiassen included the type that I call Tasik in his Thule Type 3. However, the harpoon points having the general characteristics of open socket, single spur, and blade slot in plane of the line hole in the Point Barrow Area are easily separated from the similarly defined, somewhat cruder points of the Canadian Arctic. In turn, Tasik heads are easily distinguishable from the similar Punuk Period harpoon heads that Collins describes as Type III(a)x. At this stage in the study of Eskimo archeology the finer classification seems both practical and desirable.

The majority of harpoon heads from the Point Barrow Area are made of antler, particularly the heads from the earlier sites, Birnirk and Kugok. This is in contrast to Bering Strait and St. Lawrence Island where most of the harpoon heads are made of walrus ivory. In discussing harpoon heads of the generalized Birnirk type on St. Lawrence Island, Collins makes the point that they resemble the Birnirk heads of the Arctic Coast in the further particular of being made of bone instead of ivory.[1] The reverse situation also occurs. The Punuk style of harpoon heads found in the structures beneath Mound C at the Nunagiak Site described above were made of ivory. It seems very likely that this Punuk material actually was manufactured in the Bering Strait Region and that possibly the Birnirk type of harpoon heads on St. Lawrence came from the Arctic Coast.

BIRNIRK OPEN SOCKET

Figure 26[2]

All these harpoon heads are made of antler; the spongy interior of the piece of antler is utilized for the socket side of the harpoon head.

Lengths range from 7 to 13.5 cm., averaging about 10 to 11 cm.

Spurs, placed asymmetrically on the side of the harpoon head opposite the barb, have from one to three points. On the single and bifurcated examples there are frequently one or more vestigial spur points that are more ornamental than useful.

The open sockets are usually flanked by two lashing slots; some, however, have only one slot, with a groove on the opposite side; two heads have only grooves.

Line holes are small and usually round; a few specimens have triangular holes that are also quite small.

At right angles to the line hole, the blade is flattened, and a well-defined median ridge divides the facets that form the blade edges.

[1] Collins, 1937, 118.

[2] Also see Wissler, 1916, Fig. 4a–b; Mathiassen, 1930, Pl. 7, Figs. 1–2.

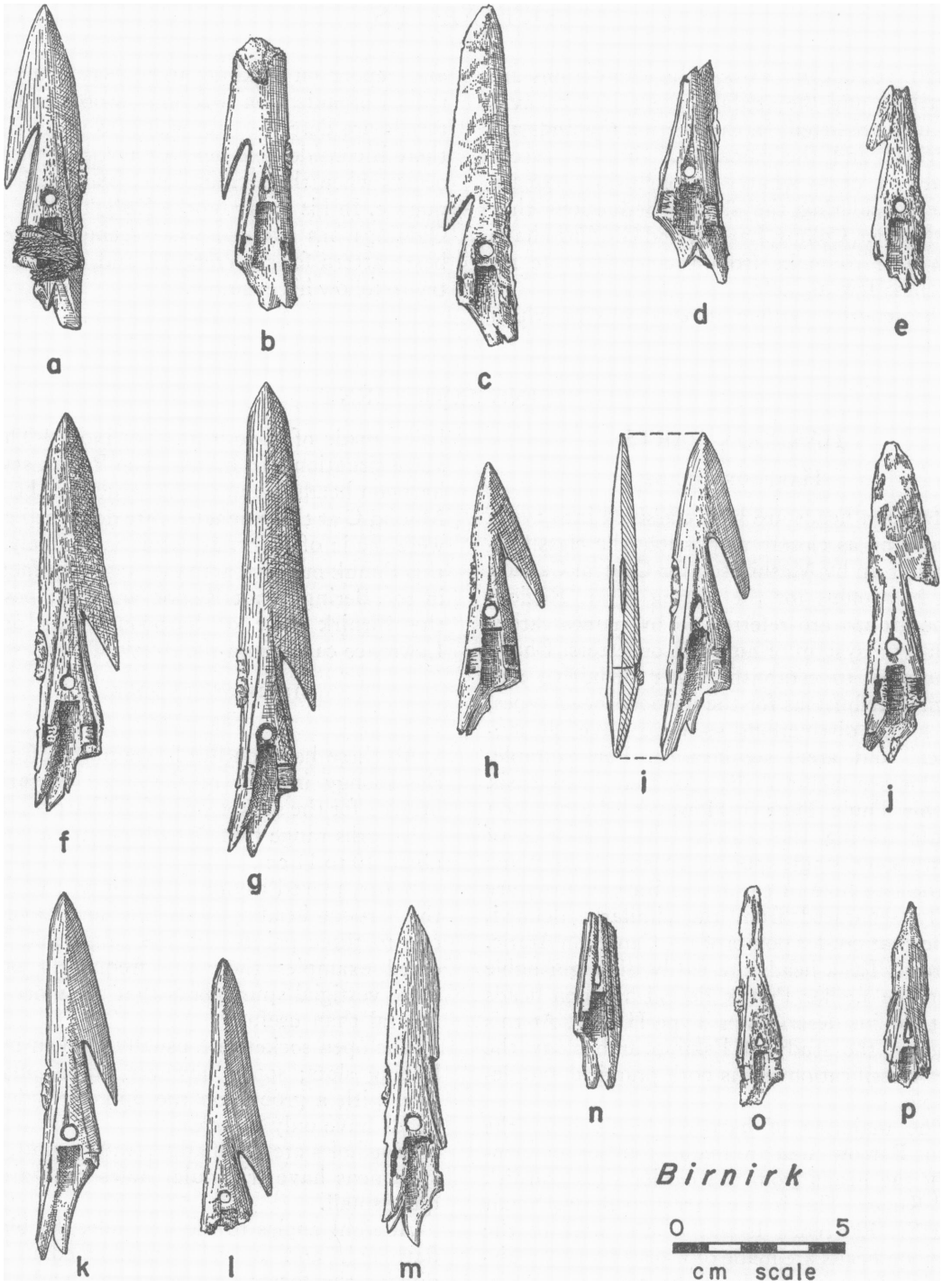


FIG. 26. Harpoon heads of Birnirk Type from the Birnirk Site.

The blades are usually about twice as long as the portion of the harpoon head below the line hole. One edge of the blade, the edge opposite the spur, has been cut to form a barb. Opposite this a chipped flint side blade is set into the edge of the blade. Several heads have additional ornamental side blade sockets, too shallow to have held a blade.

Most of the harpoon heads are simply decorated with straight incised lines that diverge from the median ridge about halfway between the line hole and the blade point and pass on each side of the line hole to intersect the lashing slots. Also, a short incised line is often found extending above the line hole.

In the study of the harpoon heads classified as Birnirk, an attempt was made to divide this group into more strictly defined classes. The heads were divided according to the position of the spur, on the right or left when viewed from the open socket side. Right and left spurs are about equal in number, and, so far as could be discovered, there is no chronological difference. A division on the basis of size was also tried, with negative results.

COMPARISONS: It seems strange that this type, so popular at the Birnirk Site (18% of all harpoons), is so rare in other regions of the Eskimo territory. Apparently the one area where it is as abundant as at Point Barrow is a site on Cape Baranov, just east of the mouth of the Kolyma River. From this locality Beregovaya illustrates 11 examples of this harpoon head, so identical to those from Point Barrow that they might well have come from there.[1] The accompanying type at Cape Baranov, apparently about equally abundant, was Tuquok Open Socket. On the basis of harpoon head types, this seems to be a Birnirk Culture site.

OOPIK OPEN SOCKET

Figure 27b–e

Oopik Type heads are made of antler. The socket side of the head is formed on the cancellous face of the piece of antler; the back of the harpoon head is formed from the harder outer layer.

The heads range from 7.5 to 10.5 cm. in length and average about 8 cm.

The open sockets are flanked by one lashing slot and groove, by two lashing slots, or, as on one head, by lashing grooves.

The line holes are round and small, with very slight beveling towards the spur.

These harpoon heads taper to rather sharp, bayonet-like blades. The blade is thin, at right angles to the line hole, and has sharp edges in the plane of the line hole. In cross-section the blades are diamond shaped; flattened facets form median ridges that extend from the blade point to the tip of the spur on one side and to the "heel" of the point on the other.

Stone side blades are set in sockets that pass through the blades in the plane of the line hole. Single piece, chipped stone blades were found in all but one harpoon; this had a single slate blade.

For decoration four of the five harpoons of this type have straight lines cut into the flattened facets of the blade, extending from the upper edge of the stone side blades towards the base of the harpoon. On the spur side these lines converge just above the tip of the spur; on the opposite side, just above the heel.

COMPARISONS: Seven harpoon heads of this type were collected. The type has been recorded in similar numbers on St. Lawrence Island. Collins classes these heads as Type II(a)x and lists two found in the upper levels of the Miyowagh Site in what should be Early Punuk context.[2] From the Kukulik Site on the north shore of St. Lawrence Island, five heads of this type are illustrated.[3] These heads are also associated with typical Punuk Period materials.

Collins may be correct in indicating that the type here called Oopik evolved from the Old Bering Sea harpoon head of the type he designated as Ix.[4] A harpoon head of this earlier form, collected from the Point Barrow Region by Stefánsson, is catalogued as coming from Cape Smythe (Utkiavik) and, as has been indicated elsewhere, I suspect this specimen was found at the Kugok burial site.[5]

However, an extremely interesting problem is raised by the fact that the Oopik Type of

[1] Beregovaya, 1953, Fig. 7; Items 1–2 in Fig. 5 illustrate a head of this same type from Chetyrekhstolboryy Island. Mathiassen, 1927b, Fig. 12, also illustrates this head.

[2] Collins, 1937, Table 2, Fig. 24. Two additional heads of this type are illustrated from Cape Kialegak on St. Lawrence Island, Pl. 27, Figs. 3–4.

[3] Geist and Rainey, 1936, Pl. 58g, Pl. 69, Figs. 1–4.

[4] Collins, 1937, Fig. 24.

[5] Wissler, 1916, Fig. 9.

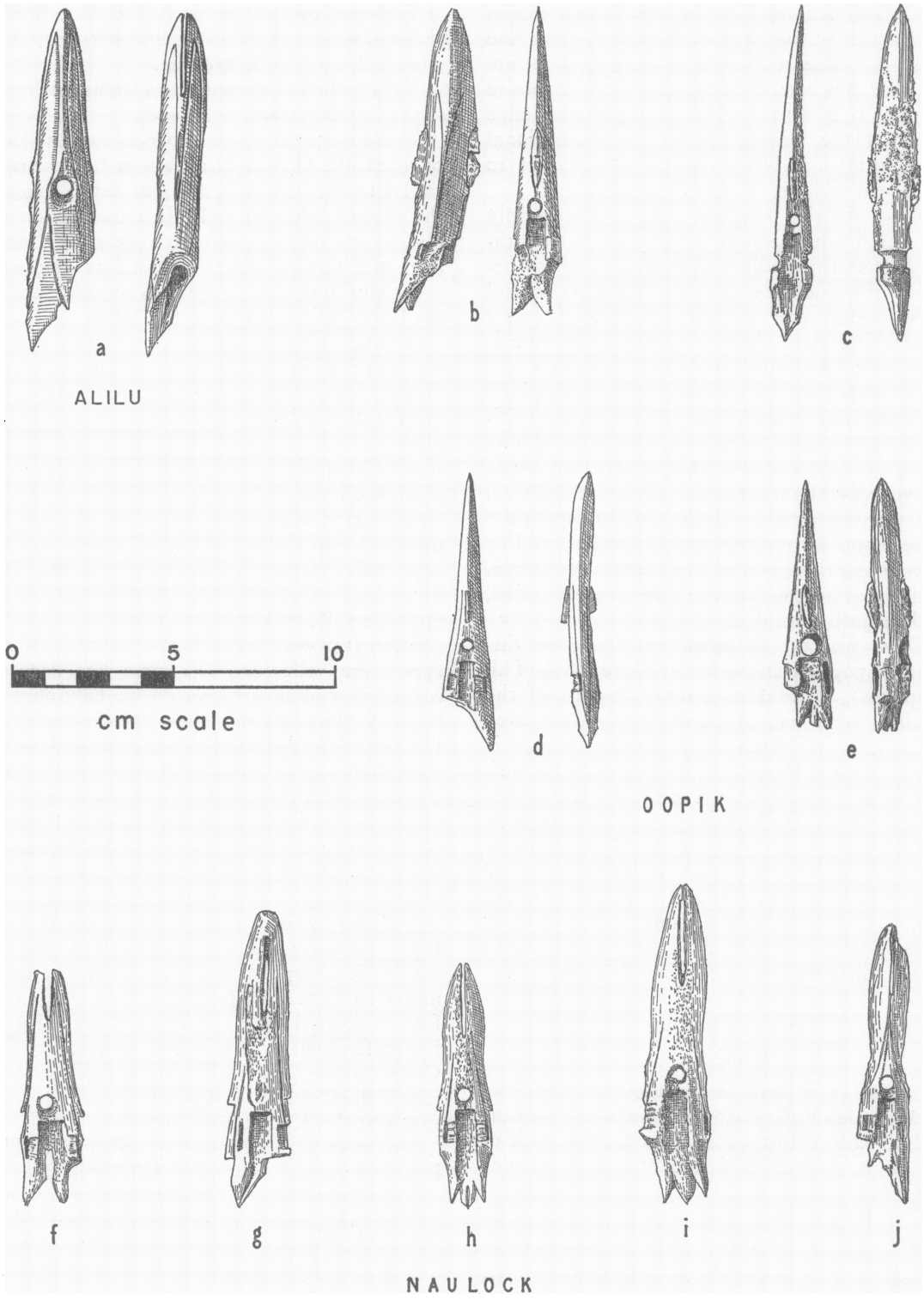


FIG. 27. Harpoon heads of Alilu, Oopik, and Naulock types from the Birnirk Site.

heads has a fundamental resemblance to Ipiutak Type 1 harpoon heads. Larsen and Rainey have discussed the similarities; their conclusion that the Ipiutak heads are ancestral to both the Old Bering Sea and Birnirk forms is probably correct. Still the Oopik Type of harpoon head and the Ipiutak Type 1 heads are more similar to each other than either is to the related Old Bering Sea Type, Ix. Both are made from antler rather than ivory, are similar in size, have only one line hole, and have asymmetrically placed spurs with one to three points rather than a symmetrical three-pointed spur. As a matter of fact, the round versus diamond cross-section of the head and the rather simple decoration of the Ipiutak heads are about all that distinguish the types. It seems probable, then, that the Oopik Type on the north coast developed directly from the Ipiutak Type 1, without the intervention of the Old Bering Sea form.

NAULOCK OPEN SOCKET

Figure 27f–j[1]

The material is usually antler. Only three ivory heads were found out of a total of 44.

The average length is 9 cm., with very little variation from this figure.

The spur, usually laterally placed, is slightly asymmetrical and usually had a bifurcated tip. Gracefully carved three- and four-pointed spurs also occur.

The open sockets are always placed on the softer, cancellous side of the piece of antler. Two lashing slots are usual; four of the heads of this type have one slot, and one has merely a lashing groove.

The line holes drilled in the plane of the open sockets are round. There is slight beveling towards the base of the point to accommodate the line, and usually an ornamental depression extends from the line hole to the base of the blade slot.

Blade slots are made in the plane of the line hole. An unfinished specimen shows that the slots were made by first perforating the head below the point, then opening up the slot to the point with a narrow tool (Fig. 27g). This produces a blade slot that is almost closed towards the point of the harpoon and must be sprung apart for the stone blade to be inserted. Slate blades were found in the same levels, but no harpoons were recovered with blades in place.

These harpoon heads are flattened at right angles to the line hole and blade slot and have rounded contours and fairly sharp edges that swell out gracefully to provide reënforcing ridges for the prongs that hold the stone blade.

In addition to the depression extending towards the point from the line hole described above, decoration rather uniformly consists of two incised lines that start at the lower end of the blade slot and diverge towards the line hole. On most examples these lines reach the edge of the harpoon head opposite the line hole and serve to delineate two small, purely ornamental barbs. Below these barbs, towards the spur, the harpoon frequently has a scalloped profile, and there is a tiny nick in the top of the low points that lie between the scallops. This is a feature of Punuk Period points on St. Lawrence Island. On a few examples these scallops are longitudinally grooved to form shallow, non-functional side blade slots.

COMPARISONS: In form the Naulock Type closely resembles the type on St. Lawrence Island that Collins has designated as IIIx.[2] These are usually made of ivory. The form ranges in date from Old Bering Sea to Punuk, and Collins demonstrates that with the passage of time the heads became smaller, spurs became simpler, and the elaborate Old Bering Sea style of decoration was replaced by the simpler Punuk style. The closest resemblance to Naulock heads is found in the Early Punuk Period heads from the later deposits of the Miyowagh Site.[3]

There seems to be little doubt that Naulock served as the ancestral form for the type described below as Tasik Open Socket. This is paralleled on St. Lawrence Island by the development of the popular Punuk period type III(a)x from IIIx.[4]

TUQUOK OPEN SOCKET

Figure 28a–f[5]

The material is usually antler, with a length range of 10 to 16 cm., average, about 14 cm.

The spur is usually bifurcated, but fre-

[1] For additional illustrations, see Wissler, 1916, Fig. 3a–b, e, and Larsen and Rainey, 1948, Pl. 87, Figs. 3–4.

[2] Collins, 1937, 104–106, Pl. 23, Fig. 4, Pl. 24, Figs. 11–23.

[3] Collins, 1937, Pl. 24, Figs. 20–21.

[4] Collins, 1937, Fig. 24.

[5] For additional illustrations, see Mason, 1930, Pl. 5, Fig. 9; Murdoch, 1892, Fig. 210.

quently there is a vestigial third prong. The spur is asymmetrically placed.

About half of the harpoon heads have two lashing slots; the rest only one.

The line holes are small and either round or triangular.

Separate, chipped stone side blades are fixed in sockets on each side of the blade. The blade is lanceolate in form, diamond shaped in cross-section, with faceted sides, sharp edges, and a sharp point. The length of the blade above the line hole tends to be about twice the length of the portion of the harpoon head below the line hole.

As decoration, two diverging straight lines incised on each side of these harpoon heads run from the median ridge halfway between the line hole and the tip of the blade, down towards the base. These lines frequently intersect the openings of the lashing slots. In addition, a triangular area of the surface was sometimes routed out above and below the line hole. Edges of this depression parallel the incised lines described above.

COMPARISONS: Tuquok is a fairly common type at Birnirk, comprising 11 per cent of all the harpoon heads. It is particularly interesting that Beregovaya illustrates 11 specimens of this type from the site at Cape Baranov, near the mouth of the Kolyma River in Siberia.[1] The occurrence of Birnirk Open Socket heads at this same locality is noted above (p. 77).

From the Sirhenik Site west of Indian Point, Siberia, Rudenko illustrates a single head of the Tuquok Type.[2] Other harpoon heads illustrated from there are principally Punuk types, although there are three examples of Thule 2 heads.

On St. Lawrence Island, Collins describes these harpoon heads as Type II(a)y. Only three examples were found in the upper levels of the Miyowagh Site, all in Early Punuk Period context. However, Geist and Rainey illustrate six examples from the Kukulik midden, where again the accompanying types seem to indicate the Punuk Period.[3]

Collins is undoubtedly correct in indicating that the Tuquok form had its origin in the Old Bering Sea double line hole harpoon head which he describes as Type Iy.[4] In the Point Barrow Area it appears to be the ancestral form for a type that is described below as Tipiruk Open Socket.

Two ivory harpoon heads from the Near Ipiutak deposits at Point Hope resemble the Tuquok Type, with the principal difference that the line holes have been cut rather than drilled.[5]

KATOKTOK OPEN SOCKET

Figure 28g

Because there is only one specimen this class is very tentatively defined. Made of antler, it is 13.5 cm. long and has an open socket with two lashing slits. The small line hole is triangular, and the spur has a single point. Its distinguishing feature is the point of the harpoon head, formed by the upper two-thirds of its length, which has been flattened into lanceolate shape with its sharp edges in the same plane as the line hole. Typologically this point appears to be a later development of the type described above as Oopik Open Socket. If this harpoon head had stone side blades, it probably would have been put in that class.

COMPARISONS: This form of harpoon head has not been reported from Eskimo territory. I am afraid that I shall have to present this as the classic example of a type represented by only one specimen.

TIPIRUK OPEN SOCKET

Figure 28h–l

The material is usually antler, although one head from Birnirk, Mound A, Cut 3, Section 2, is of ivory.

The heads range from 5 to 8.5 cm. in length.

The spurs, ranging from single to trifurcated points, are asymmetrically placed at one side of the midline of the head.

The sockets are open, rectangular, and always provided with two lashing slots.

The blades are diamond shaped in section, thin at right angles to the line hole, and have fairly sharp edges and sharp points. There is neither an inserted blade nor side blades; several points, however, have vestigial blade slots. The ivory head from Birnirk, Mound A, Cut 3, Section 2, has three on one side of the blade and two on the opposite side. Other heads have

[1] Beregovaya, 1953, Pl. 6.
[2] Rudenko, 1947, Pl. 19, Fig. 11.
[3] Geist and Rainey, 1936, Pl. 69, Figs. 5–9.
[4] Collins, 1937, Fig. 24.
[5] Larsen and Rainey, 1948, Pl. 78, Fig. 4, Pl. 83, Fig. 1.

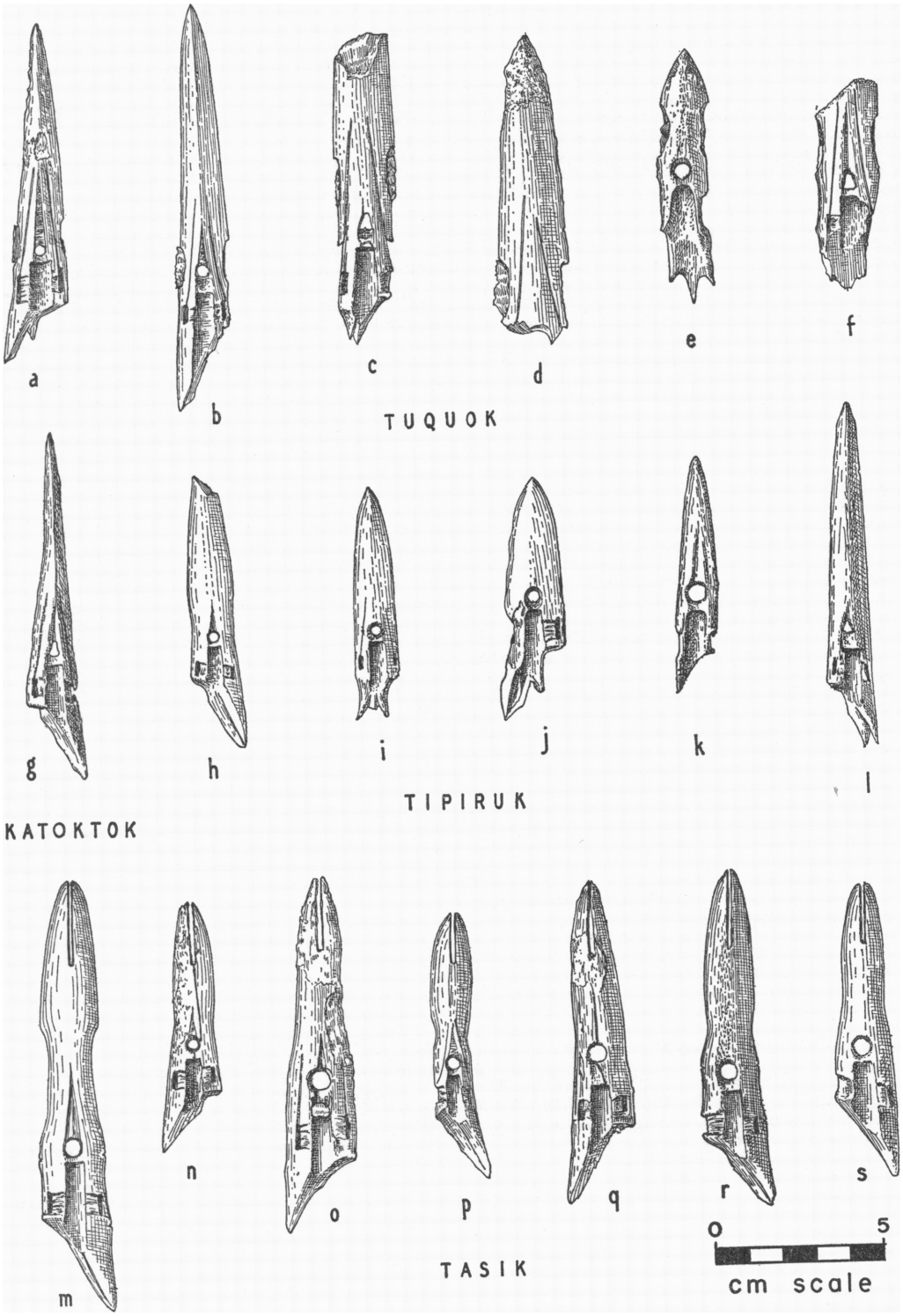


FIG. 28. Harpoon heads of Tuquok, Katoktok, Tipiruk, and Tasik types.

slight scallops in the edge of the blade opposite the line hole. These are even more attenuated remnants of stone side blades.

COMPARISONS: Harpoon heads of this type are rather widespread. Rudenko illustrates Tipiruk heads from Cape Chaplin, Naukan, and the Cape Dezhnev Area in Siberia.[1] A single specimen from East Cape is illustrated by Mathiassen.[2]

Collins describes similar harpoon heads from the series of sites at Gambell, St. Lawrence Island, as Type V. Seven were found in the old part of the present village, and three came from Seklowaghyaget, from a Thule or Late Punuk Period context.[3]

Mathiassen classified this type as Thule Type 1, a characteristic form found at most of the Canadian and Greenland Thule Culture sites.[4] However, the harpoon heads from the Thule sites are somewhat shorter and broader than the rather slender, western Tipiruk heads.

Tipiruk Open Socket evidently is derived directly from the earlier Tuquok Type. The principal changes are the simplification of the spurs and the elimination of the stone side blades which are frequently replaced by ornamental and non-functional grooves. It seems clear that the Thule Type 1 form from Canada originated in northern Alaska.

TASIK OPEN SOCKET

Figure 28m–s[5]

These harpoon heads are 7.5 to 13 cm. long, averaging 8.9 cm., and are made of antler.

The majority of the heads in this class have single-pointed, lateral spurs asymmetrically placed. Some spurs are gracefully scalloped along their lower margin; these are evidently vestiges of once functional additional points to the spur.

This type of head is oval in cross-section, with the flattened sides of the oval at right angles to the plane of the line hole and blade slot. Usually, the outline of Tasik heads is constricted between the line hole and the blade slot. The open sockets are placed on either the dense or the cancellous side of the fragment of antler. Two harpoon heads have small insets at the upper end of the socket to reënforce it against the thrust of the point of the foreshaft (Fig. 28o).

Eleven of these heads have two lashing slots; three have one slot and an open groove on the opposite side; and one has only lashing grooves.

All the line holes are small, round, and only slightly beveled to accommodate the line. Above the line hole an excised ornamental depression tapers towards the blade slot. The blade slots, in the same plane as the line hole, are cut so that the prongs holding the blade tend to spring together at the point.

Ornamentation is confined to the incised area above the line hole described above, and in some, in addition, two diverging incised lines parallel it part way along the length of the harpoon head, terminating in the lashing slots (Fig. 28o).

Tasik harpoon heads in gross plan resemble the type Naulock Open Socket, but the details are different as may be seen by comparing the illustrations.

COMPARISONS: About 7 per cent of the harpoon heads from Birnirk and 6 per cent of those from Nunagiak are Tasik. In basic form they resemble the type which Collins designstes as III(a)x, the type most common in the Punuk Period deposits in the Miyowagh and Ievoghiyoq sites on St. Lawrence.[6] The principal distinctions are that the St. Lawrence specimens are nearly all made of ivory and have sharp edges, and flattened facets so that they are hexagonal rather than oval in section; and the Punuk Period examples are frequently decorated with incised lines. There seems to be little doubt that Tasik parallels the St. Lawrence III(a)x type in time and had a common origin in the Old Bering Sea IIIx form.[7]

From Ekseavik on the Kobuk River, Giddings illustrates four harpoon heads that may be placed in the Tasik class.[8] The tree-ring date for this site is about 1400 A.D.

A somewhat crude version of this type, characteristic of the Thule Culture sites of the Canadian Arctic, is described by Mathiassen as

[1] Rudenko, 1947, Pl. 13, Figs. 3–4, Pl. 10, Figs. 2–3, Pl. 7, Fig. 21.

[2] Mathiassen, 1930, Pl. 18, Fig. 2.

[3] Collins, 1937, 211, Table 2, Pl. 71, Figs. 12–13.

[4] Mathiassen, 1927a, Naujan, Pl. 1, Fig. 1, three specimens; Qilalukan-Mitimatalik, Pl. 40, Fig. 5, four specimens; Kuk House VII, Pl. 69, Fig. 1, one specimen; Comer's Midden, Thule, Pl. 78, Fig. 1, three specimens.

[5] Collins, 1937, 209; Mathiassen, 1927b, 18–20.

[6] Collins, 1937, 203–205.

[7] Collins, 1937, Fig. 24.

[8] Giddings, 1952, Pl. 27, Figs. 16, 19; Fig. 32, Items 4–5.

Thule Type 3.[1] This often has drilled lashing holes rather than the lashing slots that are usual for Tasik heads from the Birnirk Site. This late tendency towards the replacing of lashing slots with holes can also be observed in the Point Barrow Area. There is reason to believe that the Thule Type 3 evolved from the Tasik Open Socket type of harpoon head.

NATCHUK OPEN SOCKET

Figure 29[2]

These harpoon points are similar to the Birnirk Type described above, except for the following. They are smaller, the size ranging from 5 to 14 cm., and the average is markedly smaller than the Birnirk Type, about 6 to 7 cm. as compared to 10 to 11 cm. The spurs are undivided in about half of the examples; the remainder have two points to the spur. Some spurs are placed asymmetrically, but others are placed symmetrically on one side of the harpoon head. Harpoon heads with single lashing slots slightly outnumber the heads that have two lashing slots. The line holes of the Birnirk Type with stone side blades were round in all except five examples; only about half of these heads have round line holes, and the remainder are triangular. The barbs, similar to those in the preceding type, are always on the side away from the spur and are to the right about as frequently as to the left.

These heads have no chipped stone side blades. However, about 80 per cent of the blades have a small flattened area or one or more small, non-functional grooves where the stone side blade would be located on the Birnirk Type. The blades of these harpoons are flattened at right angles to the line hole; the edges and point of the blade are sharp. The median ridge, however, is usually less well defined than on the Birnirk Type, and the cross-section tends to be curved.

Decoration is relatively rare and, when present, consists of straight incised lines arranged as described for the Birnirk Type.

COMPARISONS: It seems clear that the Natchuk Type has evolved from Birnirk Open Socket heads by the elimination of stone side blades and the reduction of the multipronged spur to one point. Both these forms, well represented at Birnirk, are rare to the east and west, which leaves little doubt that this development centers in the Point Barrow Area. This type appears to represent a step in the development of the Thule Type 2 harpoon head.

The Natchuk Type of head has not been found on St. Lawrence Island, nor is it reported by Giddings from the Kobuk River. Larsen and Rainey illustrate two with Tigara Period burials and one from a Jabbertown house at Point Hope.[3] Rudenko also illustrates a point of this type from the Sirhenik Site in Siberia.[4]

From the Kuk Site on Southhampton Island, Mathiassen illustrates one of two harpoon heads that can be assigned to this type.[5] These Thule Culture specimens are wider than the heads representing this type at Point Barrow. Closer resemblance is shown by a harpoon head which Collins excavated at Resolute, Cornwallis Island.[6]

SICCO OPEN SOCKET

Figure 30a–b

The four harpoon heads of this type are made of antler. They range in length from 9 to 12 cm. The spur is simple and is placed symmetrically at right angles to the line hole. The open sockets are cut, rectangular, and flanked by two lashing slots. The small, round line holes are in the same plane as the sockets and the blade slits.

In cross-section these angular heads are thin, at right angles to the line hole, with flat facets. Fairly pronounced ridges reënforce the prongs on each side of the blade slots.

On one of these heads, purchased at Nunagiak, a simple triangle formed of spurred lines is incised above the line hole; a similar line runs down the spur, dividing opposite the socket. Another head, collected from the beach below Mound C at Nunagiak in 1932, has an engraved triangle over the line hole, bordered by raised ridges that extend from the sides of the line hole towards the base of the blade slot. The third head of this type, collected by Stefánsson at

[1] Mathiassen, 1927a, Naujan, Pl. 1, Figs. 6–12, 18 specimens; Qilalukan-Mitimatalik, Pl. 39, Fig. 7, nine specimens; Kuk House VII, Pl. 69, Fig. 3, three specimens; purchased from Kuk, Pl. 73, Fig. 12, one specimen; Malerualik, 309, Pl. 82, Fig. 2, two specimens.

[2] For additional illustrations, see Wissler, 1916, Fig. 4c–d.

[3] Larsen and Rainey, 1948, Pl. 88, Figs. 4–5, Pl. 95, Fig. 2.

[4] Rudenko, 1947, Pl. 19, Fig. 13.

[5] Mathiassen, 1927a, 234.

[6] Collins, 1952, Pl. 10, Fig. 4.

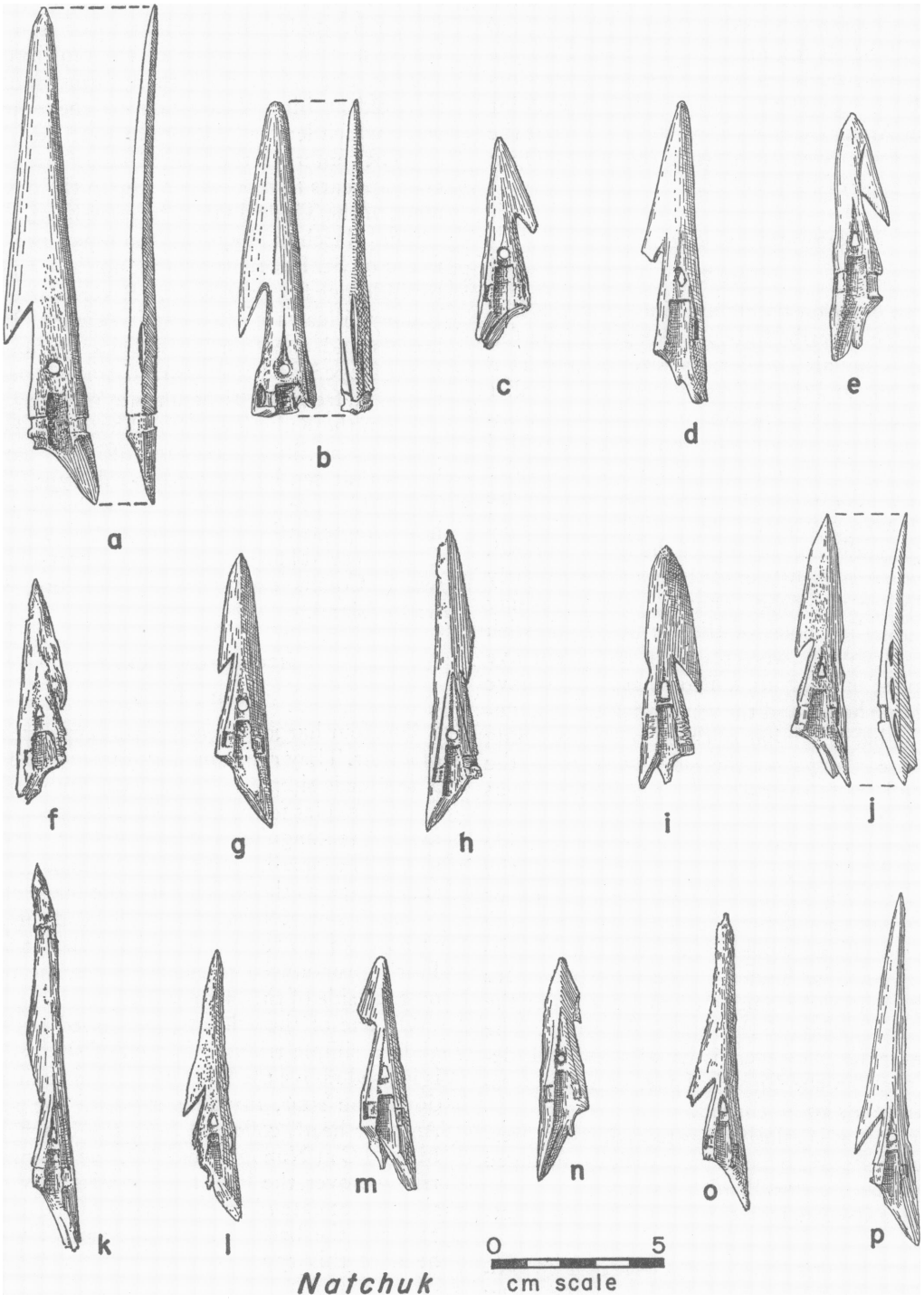


FIG. 29. Harpoon heads of Natchuk Type.

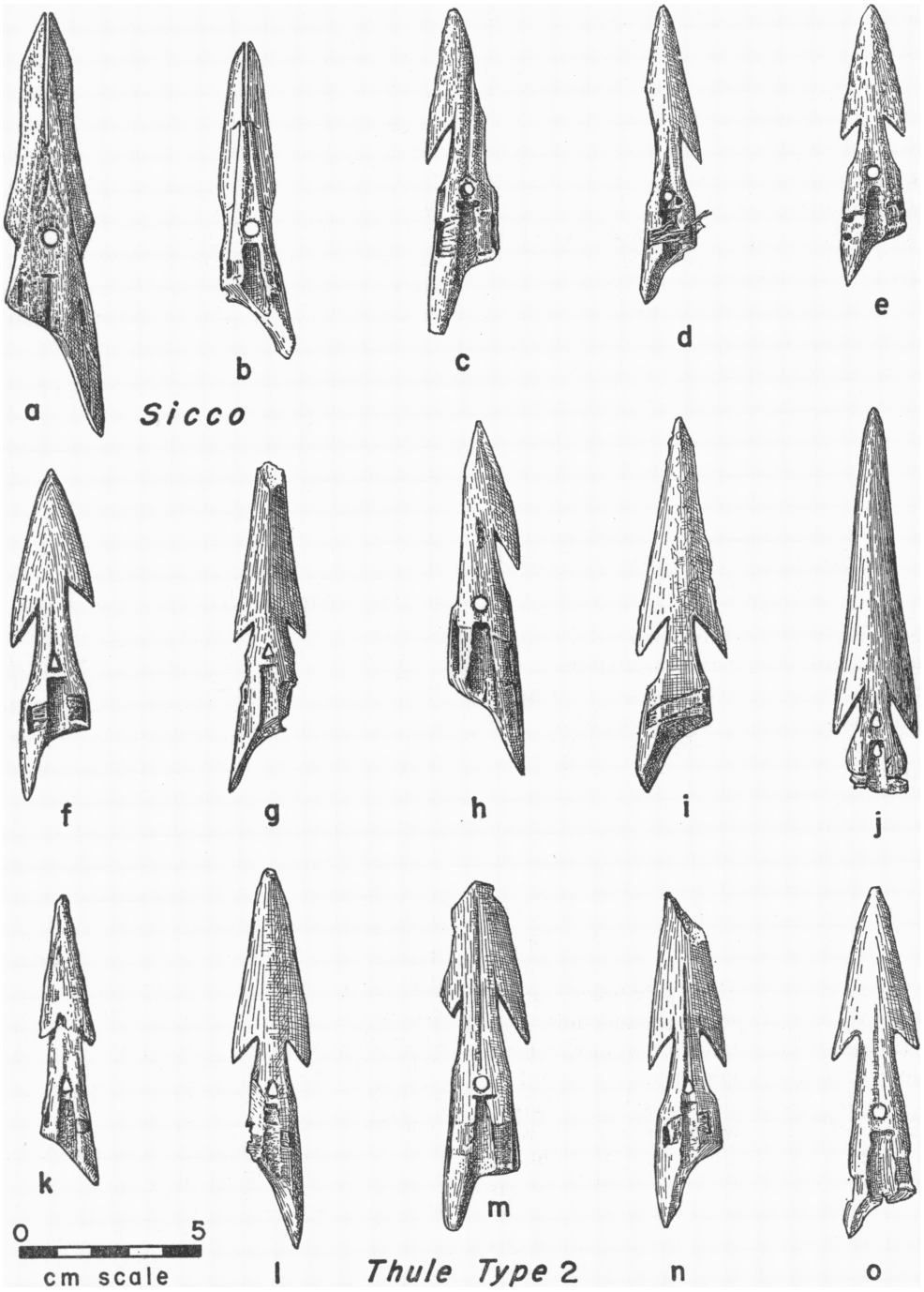


FIG. 30. Harpoon heads of Sicco and Thule 2 types.

Point Barrow, has two scallops representing vestigial blade slots on each edge opposite the line hole. It is decorated with two pairs of simple slanting lines. The fourth harpoon head is unfinished. It came from Nunagiak, Cut 2, Section 3.

COMPARISONS: This is not a prominent type at Point Barrow, but it may have played a part in the development of the facets on the historic type, Barrow Closed Socket, described below. Except for the cross-section, Sicco is very closely related to the Tasik form; Tasik is oval, while Sicco has pronounced ridges and facets. As a matter of fact, Sicco is apparently a direct copy of the Punuk Period type popular in Bering Strait and on St. Lawrence Island, described by Collins as Type III(a)x.[1]

ALILU CLOSED SOCKET

Figure 27a[2]

The two harpoon heads of this type are made of antler. The spur is laterally placed: asymmetrical on one, symmetrical on the other. Both spurs have single functional points; one head has an additional ornamental spur.

These harpoon heads are oval, almost round, in cross-section. The line holes are drilled and slightly beveled towards the base. At right angles to the line holes, slots for inserted blades are cut in the upper end, so that it is necessary to spring the tips of the prongs apart to insert a blade of even thickness.

The most striking feature of these two harpoon points is the decoration. In contrast to the usual pattern of incised lines, a rather simple design is formed on these heads by small raised ridges. One point has vestigial side blade slots in the ornamental ridge opposite the line hole.

COMPARISONS: The time position of this type is not clear from the single specimen found at Birnirk. At the Ekseavik Site on the Kobuk River, Giddings found two harpoon heads with raised decoration very similar to the two heads described above.[3] In these closed socket heads the blade slit is in the plane of the line hole, rather than at right angles as in the specimens from Birnirk. Giddings' tree-ring date for Ekseavik is about 1400 A.D., and his collection from the site includes the distinctive Thule 2 harpoon head and arrowpoints with knobbed tangs.

William E. Taylor of the National Museum of Canada has shown me two open socket harpoon heads with blade slits parallel to the line hole from Lady Franklin Bay in Victoria Island that were in a collection on loan to the museum. The oldest of the accompanying artifacts includes Thule Type 2 harpoon heads and arrowpoints with knobbed tangs. This tends to suggest that the rare harpoon heads with the raised decoration belong on the Thule time level.

THULE TYPE 2 HARPOON HEAD

Figure 30c–o[4]

This type, first described by Mathiassen as Type AIb1 and with several variations, was included in a more generalized class called "Thule Type 2."[5] This definition is somewhat too inclusive to be used here in its initial form, for it includes features that appear in Point Barrow types, Natchuk, Brower, and Kilimatavik.

About half of the Thule 2 heads are made of antler; the remainder are of ivory. The length ranges from 8 to 15 cm.; the average is between 9 and 10 cm. The spurs have single points symmetrically placed. Open sockets are a characteristic of these points. The majority of heads has two lashing slots; a single slot occurs on only two points. One head has an open groove; four have drilled holes instead of lashing slots. The latter is a fairly consistent feature of this form of harpoon head in the Central Arctic. The form of the line hole is about equally divided between round drilled holes and cut triangular holes. Usually, barbs are symmetrically placed, but a few are staggered (Fig. 30f). The edges of the barbs are about as sharply ground as is possible on bone. The points of the heads are also sharp.

These harpoon heads are thin at right angles to the line hole. Some are symmetrical in cross-section, rounded rather than having facets and angles as does the blade of the Birnirk Type. A few do have facets. A number of the heads, especially those made of antler, are curved on one side but flattened on the face towards the inside of the piece of antler from which they

[1] Collins, 1937, 203–205.

[2] The head of this type in the Stefánsson Collection is illustrated by Wissler, 1916, Fig. 2d.

[3] Giddings, 1952, 54, Pl. 27, Fig. 18; Fig. 32, Items 2–3.

[4] See Murdoch, 1892, Fig. 209.

[5] Mathiassen, 1927b, 15–18.

were made. Usually some of the cellular tissue that forms the core of antler is visible on this face. This shape makes it possible for most of the harpoon to be formed from the hard outer portion of the material.

Decoration consists solely of an incised depression that starts below or at the line hole and extends up each face of the blade. An incised Y above the line hole, common in the Central Arctic Thule 2 heads, appears on only one specimen.

COMPARISON: This is the most distinctive and most frequently found type of harpoon head of the Thule Culture of Central Canada. Mathiassen collected 31 heads of this type at Naujan,[1] 13 from Qilalukan-Mitimatalik[2] (10 heads from this same locality would conform to this type except that they have two sets of barbs[3]), three from the Kuk Site,[4] and four from Malerualik.[5]

While Thule Type 2 harpoon heads are not numerically dominant in most Western Eskimo sites, they are widely distributed. Rasmussen collected a harpoon head of this type at Point Atkinson.[6] On the Kobuk River Thule Type 2 harpoon heads were recovered from Ekseavik, a site Giddings dates at 1400 A.D.[7] There it is accompanied by Thule Type 3 (Tasik Open Socket) and by the closed socket type here called Alilu.

On St. Lawrence Island, the Thule Type 2 harpoon heads are associated with material that marks the latter phase of the Punuk Period. Two came from the upper 2 feet of deposit in the Ievoghiyoq Site, and seven were found from 2 to 4 feet deep.[8] At Kukulik, four were found in the surface level,[9] one below the Third House,[10] and two from Meat Cache 35.[11] From Siberian sites this type is illustrated from Naukan[12] and Uwelen.[13]

The origin of the Thule Type 2 harpoon head is an important problem. Apparently it evolved from the Natchuk Type which, in turn, developed from the Birnirk Open Socket form. The transition was effected by the replacement of the stone side blade of the Birnirk Type with a second barb opposite one already present. At this same time the trends towards simplification of the spur into one point and the occasional replacement of the small round line hole with a triangular line hole occurred. Drilled holes were also occasionally substituted for the earlier lashing slots.

With diametrically contrasting arguments, Mathiassen[14] and Collins[15] have expressed the opinion that the Thule Type harpoon heads evolved on the Arctic Coast of Alaska. The evidence cited here seems to confirm this conclusion, particularly with reference to the Thule Type 2 harpoon head. Collins' hypothesis based on the St. Lawrence Island sequence proved to be the correct interpretation.

NUNAGIAK BARBED CLOSED SOCKET

Figure 31a–j[16]

Typologically this harpoon head appears to have developed from Thule Type 2. It is usually made of antler; only one of 19 is of ivory. Overall lengths range from 6 to 15 cm.; the average is between 9 and 11 cm. The single-pointed spur is short and stubby. Apparently more reliance was placed upon the holding effects of the barbs than upon the toggling action produced by the spur. Sockets are fairly large, drilled holes. The line holes are also round, drilled holes and are rather small, with a pronounced groove to accommodate the line. Sharp-pointed barbs placed at right angles to the line hole and a long, tapering, bayonet-like point form the upper two-thirds of the head. In cross-section most of the heads are lens-shaped, and the contours are rounded. An occasional head is flattened on the spongy side of the antler from which it is made and rounded on the other. Decoration which is rare consists of only a single line incised down the center of the blade, terminating in a Y over the line hole (Fig. 31b).

COMPARISONS: Harpoon heads of Nunagiak Closed Socket Type seem to have a very limited distribution. Mathiassen describes this varia-

[1] Mathiassen, 1927a, 24, Pl. 1, Figs. 2–5.
[2] Mathiassen, 1927a, 146–147, Pl. 39, Fig. 1.
[3] Mathiassen, 1927a, 147, Pl. 39, Fig. 3.
[4] Mathiassen, 1927a, 234, Pl. 72, Fig. 1, Pl. 73, Fig. 11.
[5] Mathiassen, 1927a, 309, Pl. 82, Fig. 1.
[6] Mathiassen, 1930, Pl. 1, Fig. 1.
[7] Giddings, 1952, 54.
[8] Collins, 1937, Table 2.
[9] Geist and Rainey, 1936, 93, Pl. 18, Fig. 8.
[10] Geist and Rainey, 1936, Pl. 58, Fig. 8.
[11] Geist and Rainey, 1936, Pl. 63, Fig. 8.
[12] Rudenko, 1947, Pl. 10, Fig. 1.
[13] Rudenko, 1947, Pl. 5, Fig. 2.
[14] Mathiassen, 1930, 33.
[15] Collins, 1929; 1937, 311–312.
[16] For additional illustrations, see Murdoch, 1892, Fig. 211; Wissler, 1916, Fig. 5.

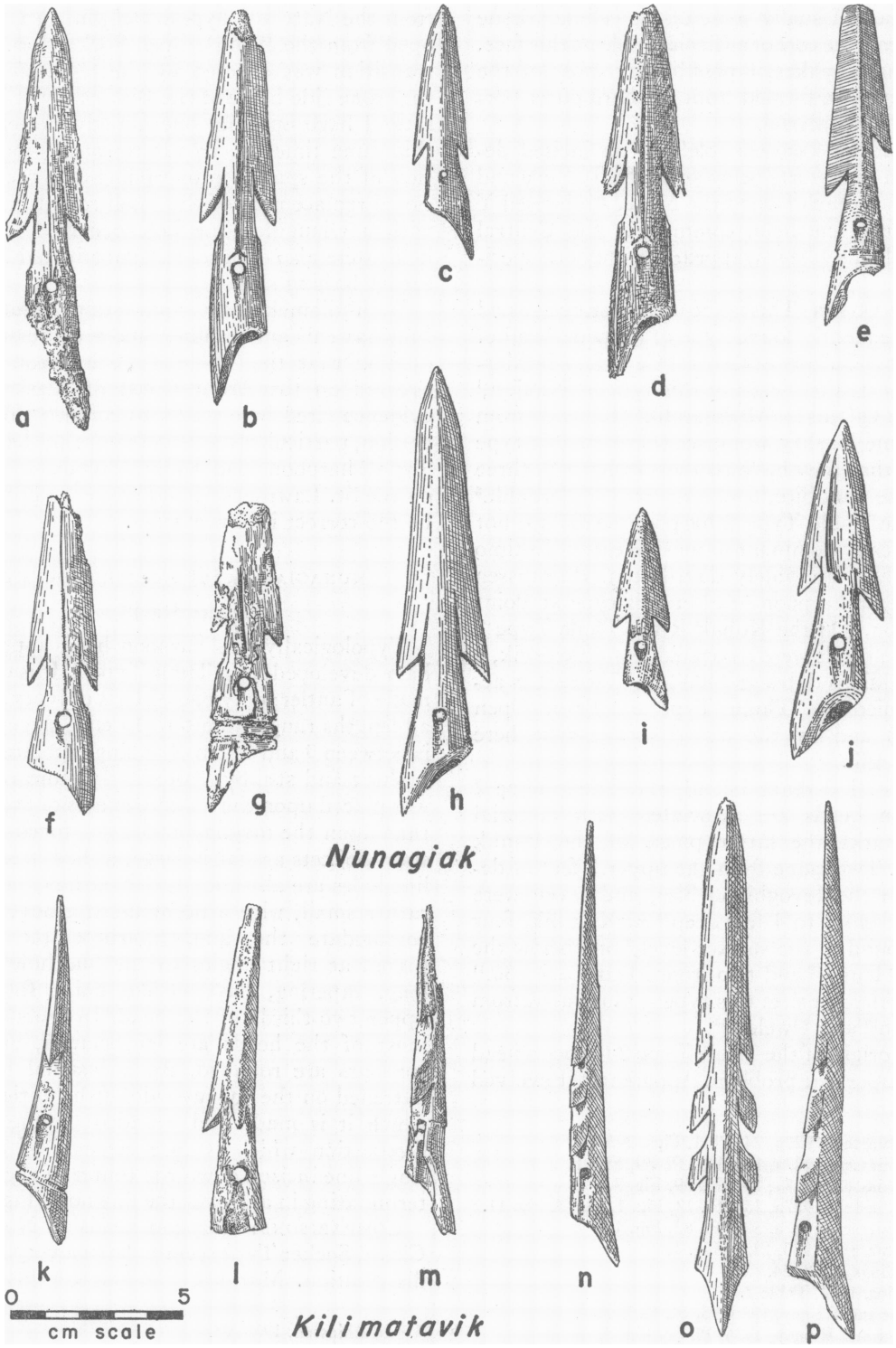


FIG. 31. Harpoon heads of Nunagiak and Kilimatavik types.

tion as Type AIIb. He describes it correctly as a form that developed from the Thule 2 Type of head.[1] This development apparently occurred too late to allow this type to spread eastward with the original spread of the Thule Culture.

KILIMATAVIK CLOSED SOCKET

Figure 31k–p[2]

All the harpoon points of this class are made of antler. A prominent distinguishing feature of all these points is the flatness of one face and the roundness, or ridging, of the opposite face. The cellular inner structure of the antler shows on the flattened faces, and the stronger cortex forms the ridged side. The spur is always on the ridged side of the harpoon. Although short, these spurs curve outward, are sharply pointed, and are evidently designed to cause the head to toggle. However, the length of the blade above the line hole would have prevented these heads from turning completely crosswise in the wound.

The closed sockets are small drilled holes. The line hole, also a small drilled hole, is placed parallel to the flat face of the head. A well-defined groove to accommodate the line runs from the line hole to the heel.

The blade above the line hole forms about four-fifths of the length of these heads. The blades have two to three pairs of sharp barbs. Blade edge and point are also sharp.

COMPARISONS: A development within the Thule Culture of Central Canada was the multiplication of the number of pairs of opposed barbs on the Thule Type 2 harpoon heads. Mathiassen designates this as AIb3 and states that it is not found in earlier Thule sites, such as Naujan, where Type 2 predominates.[3]

A few heads classed as Kilimatavik have only one pair of barbs, but most of them have two or three. The barbs are formed in the plane of the line hole, but, despite their 90-degree rotation, this seems to be a development from the Thule Type 2. In part this parallels changes that took place in the Central Arctic.

The Kilimatavik Type has a fairly limited distribution. Mathiassen illustrates a specimen from Barter Island and another from Point Hope.[4] At the latter locality, Larsen and Rainey found heads of this type with Tigara Period burials.[5] Three heads of this type from the Intermediate Kotzebue Site in Kotzebue Sound have been dated by Giddings' tree-ring studies as having been used about 1550 A.D.[6]

CAPE SMYTHE CLOSED SOCKET

Figure 32a–d

Made of bone or antler these heads range in size from 8 to 12 cm. The spur on these heads is placed laterally. Most of them have a single pointed spur which, while comparatively short, must have provided effective toggling. The spur of the harpoon head illustrated by Murdoch is bifurcated, but the heads in this collection have a single point. The socket is drilled and is comparatively large. Line holes are also drilled and from the holes towards the base of the harpoons are shallow grooves for the line. In cross-section these harpoons are thick ovals or lens-shaped. Blade slots are at right angles to the line holes and are the prominent characteristic of this type. These slots are not of the usual narrow variety but are cut out so that they will take a chipped stone point. To secure these points a wide lashing groove has been cut around the broad prongs. Murdoch[7] illustrates a head of this class with a chipped blade in place.

COMPARISONS: This is a fairly rare type in the Point Barrow Area: six were purchased from the Eskimo who had excavated them from the Utkiavik ruins; none were found in our work. Mathiassen illustrates a point of this class from the Kuk Site, House VII.[8] This is so similar to the specimens from Point Barrow that it could have been a trade item. At the Intermediate Kotzebue Site (tree-ring date, 1550 A.D.) Giddings found four harpoon heads; these, although unfinished, were obviously of the Cape Smythe Type.[9]

It is obvious that Cape Smythe is a fairly late form at Point Barrow; probably Giddings'

[1] Mathiassen, 1927b, 20.
[2] See also Wissler, 1916, Fig. 10c–e.
[3] Mathiassen, 1927b, 17.
[4] Mathiassen, 1930, Pl. 5, Fig. 2, Pl. 12, Fig. 6.
[5] Larsen and Rainey, 1948, Pl. 89, Fig. 7.
[6] Giddings, 1952, Pl. 38, Figs. 4, 8–9.
[7] For additional illustrations, see Murdoch, 1892, Fig. 212, and Wissler, 1916, Fig. 7a–c.
[8] Mathiassen, 1927a, Pl. 69, Fig. 4.
[9] Giddings, 1952, Pl. 38, Figs. 5–7.

date of 1550 A.D. is correct. However, this head with chipped blade at right angles to the line hole has no immediately ancestral form in the area. In the Bering Strait Region the comparable form has been designated by Collins as Type IIIy.[1] It is rare and dates in the Old Bering Sea Period.

Decoration is in the simple Okvik style. In the Okvik finds this form, called Type D, is more common.[2]

It is of considerable interest to note that on the Arctic Coast, at the Ipiutak Site at Point Hope, closed socket harpoon heads with blade slot at right angles to the line hole, with trifurcated spurs, are a characteristic type. Also, in contrast to similar heads elsewhere, these Ipiutak harpoon heads carry chipped flint blades somewhat thinner than those used in Cape Smythe heads. Larsen and Rainey cite the wide distribution of this form, their Type 2, and express the opinion that this is a very old type of harpoon head.[3]

The puzzle is, Where are the harpoon head forms that connect the supposedly early Ipiutak and Okvik heads and the very late Cape Smythe type?

In the course of his theorizing about the evolution of harpoon heads, Murdoch, in 1892, probably provided the correct explanation: "That is to say, the modern whale harpoon is the same pattern that was once used for all harpoons, preserved for superstitious reasons."[4] Whether Murdoch correctly interprets the motive or not, it is true that the large whaling harpoon has preserved the essential form of this abundant early variety. Some of the recent whaling harpoon heads at Point Barrow have stemmed chipped flint blades.[5] Perhaps Cape Smythe is a re-adaptation of this form to the hunting of animals smaller than whales.

BROWER CLOSED SOCKET

Figure 32e–g

These harpoon heads are of bone and range between 7 and 9 cm. in length. The heads have a rather thick oval cross-section; spurs are short and are placed at right angles to the line hole. The line holes are small, and a shallow bevel for the line extends towards the base of the head. The barbs are formed at right angles to the line hole, and the shape is exactly similar to that of Nunagiak Closed Socket. Distinguishing features are the blade slots cut in the plane of the line hole at right angles to the plane of the barbs. Two of the three heads in this collection have an incised line extending from the base of the blade to just above the line hole, where it ends in a small Y figure.

COMPARISONS: Brower is obviously a modification of the older Thule Type 2 Open Socket harpoon head. This head differs from the type described above as Nunagiak only in having a slit for a separate blade. Heads that can be assigned to this type were collected from Point Atkinson by Rasmussen, from Langton Bay by Stefánsson, and from the Cape Dezhnev Area in Siberia by Rudenko.[6]

A rather rare use of blade slits for Type 2 blades was recorded by Mathiassen as a late development in the Canadian Arctic.[7] Blades were either inserted at right angles to the line hole and thus in the plane of the barbs, or parallel to the line hole. These heads have the open sockets characteristic of Type 2. Mathiassen called attention to a head collected by Rasmussen at Point Hope, Alaska, which has an open socket, three pairs of barbs, and a blade slit parallel to the line hole.[8] Evidently similar modifications of the Thule 2 harpoon head were taking place in both the Western and Eastern Arctic.

KUK CLOSED SOCKET

Figure 32h–j[9]

This type is made of antler and is similar to Kilimatavik Closed Socket in all respects except that it lacks the paired barbs along the edges of the blade. Elimination of these features has tended to produce a shorter harpoon head. Kuk Closed Socket heads range in length from 5 to 13 cm. and average about 8 to 9 cm. The blade is triangular in section, and the short spur is symmetrically placed.

COMPARISONS: This form of harpoon is rare at Point Barrow, for the collection includes only

[1] Collins, 1937, 109, Pl. 27, Figs. 6–7.
[2] Rainey, 1941, 484, Fig. 8.
[3] Larsen and Rainey, 1948, 70–72, Pl. 4, Fig. 13.
[4] Murdoch, 1892, 239.
[5] Murdoch, 1892, 237, Fig. 232.
[6] Mathiassen, 1930, Pl. 1, Fig. 5; Wissler, 1916, Fig. 23a; Rudenko, 1947, Pl. 7, Fig. 19.
[7] Mathiassen, 1927b, 17, described under Type AId.
[8] Mathiassen, 1930, Pl. 12, Fig. 3.
[9] For additional illustrations, see Wissler, 1916, Fig. 10c.

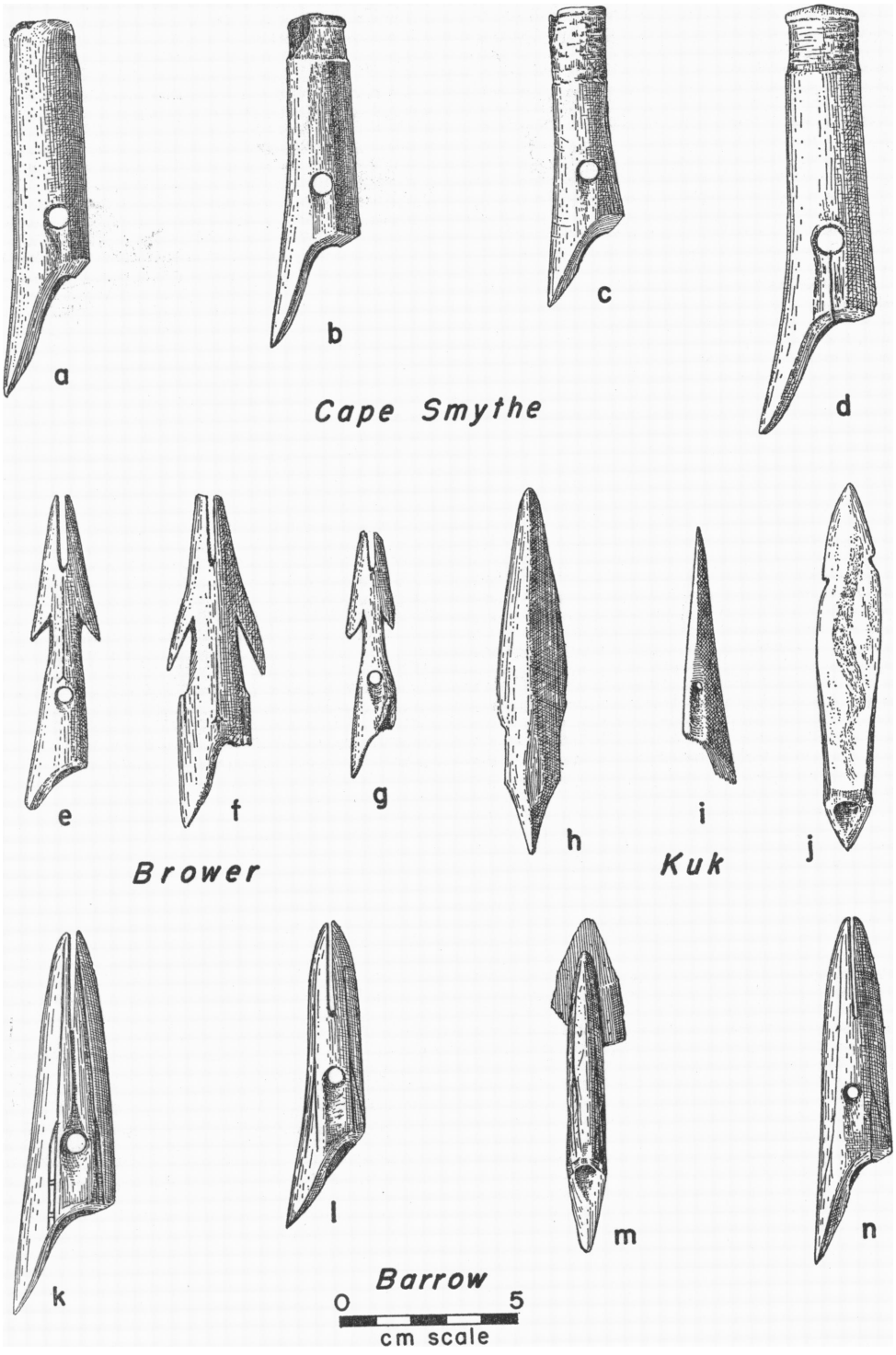


FIG. 32. Harpoon heads of Cape Smythe, Brower, Kuk, and Barrow types.

10. All were purchased from Eskimo diggers. Five are reported to have come from Utkiavik and five from Nuwuk. An additional head of this type was purchased from natives camped at Icy Reef near Cross Island to the east of Point Barrow. It is reported to have been found in the vicinity. Aside from these finds, I do not know of other occurrences of this specific type. However, there is no doubt that more intensive work on some of the other late middens along the Arctic Coast will show a limited geographical distribution.

This harpoon is a companion type for Kilimatavik and very likely has a similar time range. Giddings' finds indicate that Kilimatavik was in use in 1550 A.D.

BARROW CLOSED SOCKET

Figure 32k–n[1]

Four are made of ivory, three of antler. In cross-section these harpoon heads have six facets, with definite angles between the flattened planes. The spur is at right angles to the line hole, is fairly large, and has a single point. The line hole is fairly large. The bevel below the hole for the line is definite, but rather shallow. Blade slots lie in the plane of the line hole; the sides are cut parallel; the tips need not be sprung apart for the blade to be inserted. In two of these harpoons, small rivet holes are drilled near the tips of the prongs to hold the blades; apparently the others depended on friction to hold them.

Five of the seven heads of this type are decorated. Typically, the decoration consists of a lightly etched wide line running from the line hole to the base of the blade slot. Paralleling each side, a single incised line extends from the tips of the harpoon to the base. Opposite the line hole the single incised line divides into two lines that are connected by paired horizontal lines to form a ladder design.

COMPARISONS: This is the walrus harpoon head that was in use when Murdoch collected at Utkiavik and Nuwuk from 1881 to 1883. He illustrates several examples of this type bearing the typical decoration described above.[2] Forty-two of Murdoch's specimens were made of ivory, five were of bone, and one is of antler. This is a contrast to the earlier preference for antler. In addition, some of Murdoch's specimens have features absent from my limited collection of this type. Some have bifurcated spurs and rivets to hold the blade. Everywhere in the Western Arctic the latter feature is very late.

In general outline, Barrow heads are descended from the line of open socket heads that Collins calls IIIx,[3] and Mathiassen Thule Type 3. The incised decoration found on Barrow heads seems to be a final degeneration of the more complex designs found on many harpoon heads of the Punuk Period which, in turn, derived from the complex Old Bering Sea decoration.[4]

At the Old Kotzebue Site, Giddings found a closed socket harpoon head that almost conforms to the Barrow Type in shape and decoration, but trends towards the Punuk Type III(a)x in that after the incised lines divide opposite the line hole they diverge in the Punuk style rather than run parallel. The line hole does not have a bevel for the line, and the faces through which this hole was drilled are concave as in the Punuk specimens.[5] A similar head was found at Ekseavik.[6] These specimens, for which Giddings gives a tree-ring date of about 1400 A.D., may be the ancestral forms for the historic north coast Barrow Type and the means by which attenuated Punuk influences were transmitted.

UTKIAVIK CLOSED SOCKET

Figure 33f–i

This type resembles Nunagiak Closed Socket; the principal difference between them lies in the fact that this type has multiple sets of barbs. Three of the specimens are made of antler; one is of ivory. The length ranges from 13 to 15 cm. The very short single spur on these harpoon heads could have had little effectiveness as a toggling device. This interpretation is further supported by the fact that more than three-quarters of the length of the blade is above the line hole. These heads could not have turned crosswise in the wound and apparently depended primarily on the barbs for holding game. The closed sockets are drilled; the marks of the rotary tool are plain. The small line holes

[1] For additional illustrations, see Wissler, 1916, Fig. 8a–f; Murdoch, 1892, Fig. 213.

[2] Murdoch, 1892, Figs. 215–221.

[3] Collins, 1937, Fig. 24. Note that the modern St. Lawrence type is essentially a closed socket head of this same form.

[4] For examples, see Collins, 1937, Pl. 28, Figs. 8, 12–17.

[5] Giddings, 1952, Pl. 12, Fig. 14.

[6] Giddings, 1952, Pl. 27, Fig. 18.

are beveled on the lower side to accommodate the line.

Two pairs of sharp barbs are placed at right angles to the plane of the line hole and the blade. The blade is lanceolate; the edges and tip are sharp. In cross-section the ivory harpoon head is symmetrically lens-shaped, but the two antler specimens are flattened on the side having the porous inner structure of the antler and rounded on the other.

Decoration consists of an incised line down the center of the blade. On one head this line runs into the line hole; on the other two, it terminates in a small Y figure just above the line hole.

COMPARISONS: This type is a result of the recent trend towards multiplicity of barbs among the descendants of the Thule 2 Type harpoon heads. These heads have closed sockets, but Mathiassen classified similar harpoon heads with open sockets found at the later Thule Culture sites of the central regions as Type AIb3.[1] A similar head, with the added feature of a blade slit, came from the Ievoghiyoq Site on St. Lawrence Island.[2] This apparently is a form ancestral to Kilimatavik Closed Socket points on which the line hole and spur are rotated 90 degrees.

NUWUK CLOSED SOCKET

Figure 33a–e

Five heads of this type are made of bone; 33, of antler. They are generally somewhat smaller than most other harpoon heads, ranging in size from 5 to 9 cm., with the average length about 7 cm.

These heads tend to be thick ovals in cross-section, with the line hole passing through the shorter diameter. However, on the back of the spur the oval cross-section is usually modified by flattened facets separated by angular ridges. Sometimes similar facets on the opposite side of the head result in a hexagonal cross-section. The fairly long pointed spur is at right angles to the line hole. In six of the 28 specimens the spur is bifurcated. Line holes are small, and a pronounced, but rounded, groove for the line extends towards the base of the head. The blade slit was made in the same plane as the line hole, with the sides of the slit parallel, in contrast to the earlier practice of cutting the slit so that its prongs must be sprung apart to insert the blade. Instead, small rivets held the blades in place; the holes for these pass through both prongs near the tip of the head.

Three of these harpoon heads retain their blades. One, with a bone blade, is fastened with a bone rivet. The other two have blades made of sheet iron and obviously date from the contact period.

COMPARISONS: Murdoch describes the small sealing harpoon heads he collected at Point Barrow as resembling walrus harpoons (Barrow Type), but smaller and always with a double spur. Only a few of the heads in the Nuwuk group have a split spur, but there is no doubt that this is the class to which Murdoch referred.[3] Heads of this type are still in use but usually are made of brass.

ANALYSIS OF HARPOON HEADS

It is well recognized that in the study of Eskimo prehistory harpoon heads serve much the same function of "key fossil" as do ceramics for cultures in a Neolithic stage of development.

In Fig. 34 the harpoon heads from the sites excavated in the vicinity of Point Barrow have been tabulated. For comparison, the Stefánsson Collection from Birnirk has been included. The types described in the foregoing pages are listed across the top of the chart, the oldest forms at the right, the most recent at the left. In the left-hand column the sites are also arranged in order of their apparent age. Unfortunately, there seems to be little chronological evidence as to the relative ages of the various excavation units within each site.

In general, since the excavation of the series of sites at Gambell on St. Lawrence Island, the sequence of the various harpoon head types at Point Barrow has not been in doubt. Key types such as Tuquok and Thule 2 in the Point Barrow sequence intrude into the St. Lawrence Area with sufficient frequency to demonstrate their relative age.[4] The discussion of the evolution of forms is quite brief here, because the same ground is covered in the concluding section where comparisons are made with the chronologies of St. Lawrence Island and the Central Canadian Arctic.

The information in the tabulation of harpoon heads (Fig. 34) has been translated into graphic

[1] Mathiassen, 1927b, 17.
[2] Collins, 1937, Table 2, Fig. 24.
[3] Murdoch, 1892, 230–232.
[4] Collins, 1937, 306 ff.

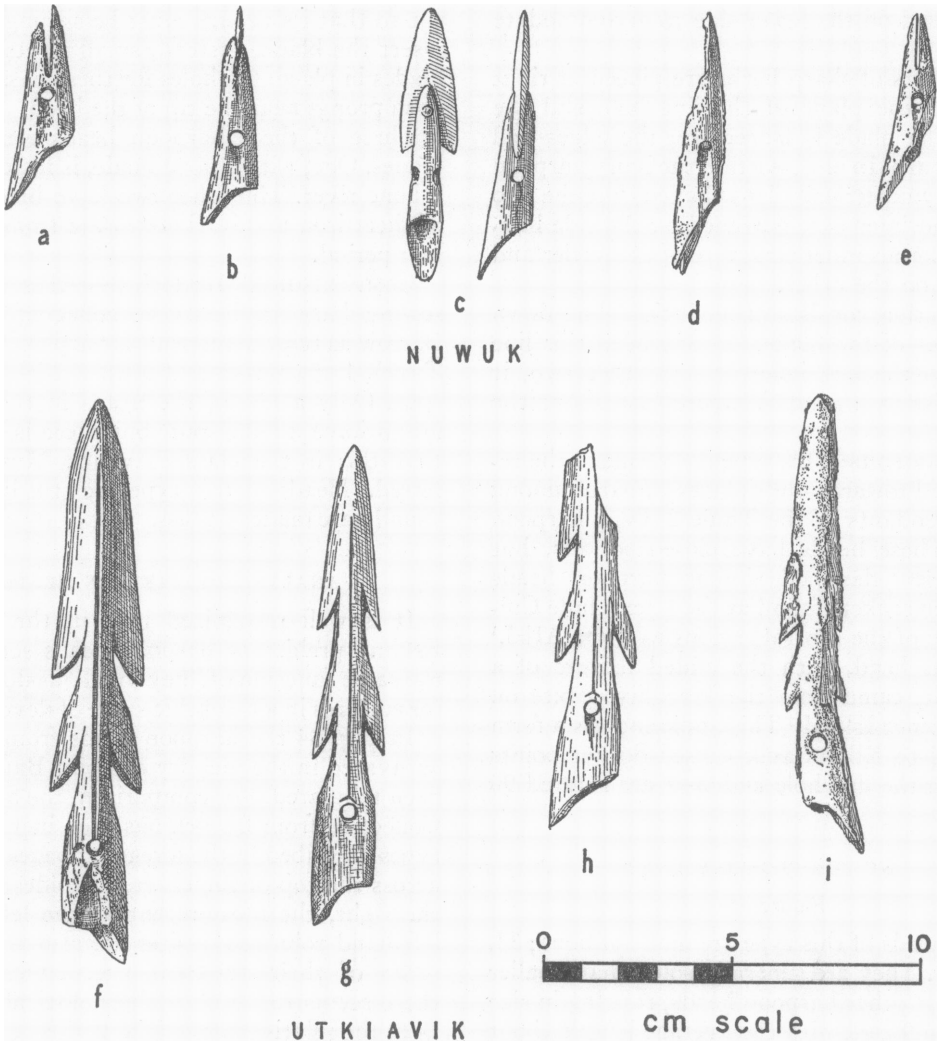


FIG. 33. Harpoon heads of Nuwuk and Utkiavik types.

form in Fig. 35. The sites, in apparent sequence of age, are listed on the left-hand side of the diagram; collection totals are on the right-hand side. The percentage of occurrence of each type in each collection is shown by the length of the horizontal bars that center on the vertical lines representing the types. These percentages may be measured by the scale in the lower right-hand corner of the diagram. For example, of the 32 harpoon heads from Kugusugaruk, 53 per cent are of the Birnirk Type, while of the total of 165 from Birnirk, 36 per cent are of the Birnirk Type.

Obviously, this rather crude seriation has produced a somewhat "fuzzy" representation of the harpoon head sequence in the Point Barrow Region. Larger collections that would provide a sufficient number of specimens to make possible the derivation of significant percentages from older and later deposits at the several sites would undoubtedly clarify the sequence. For example, the Utkiavik collection which is supposed to represent the recent cultural situation actually covers several centuries, as is indicated by Giddings' study of sites on the Kobuk River. Only three of the types included in the Utkiavik collection were made as late as 1880. These are Barrow, Nuwuk, and Cape Smythe.

Similar telescoping may be assumed for the

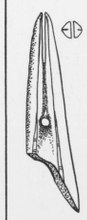
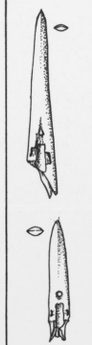
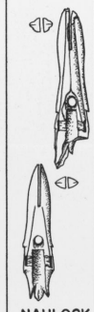
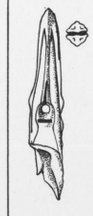
	NUWUK	UTKI-AVIK	 BARROW	KUK	BROWER	CAPE SMYTHE	KIL I MATAVIK	NUNA-GIAK	THULE 2	SICCO	NAT-CHUK	TASIK	 TIPIRUK	KATOKTOK	TU-QUOK	 NAULOCK	OOPIK	 ALILU	BIR-NIRK
NUWUK (Purchased)	12		1	5			3	1												
Cut 1 - S1																				
S2	2																			
UTKIAVIK (Purchased)	19	2	4	5	2	8	9	9	5											
House A	1				2		2													
Mound A Cut 1 - S1		1							1											
S2									1											
Cut 2 - S1						1														
Cut 4 - S2						1														
House B		1						1			1									
NUNAGIAK (Purchased)	2						1	1	5	1	1	2	2							
Mound A Cut 1 - S1	2																			
Mound B Cut 2 - S2								5												
S3										1										
S5									1											
Mound C Cut 4									2		1									
Punuk House									2	1	1			1						
NUVUWARUK Cut 3 - S4									1											
BIRNIRK (Stefansson coll.)										1	13	2	1		7	22	2	1	27	
(Purchased)											1		1				1		11	
Mound A House A Roof															1				1	
Floor															3	1			2	
Cut 4															3				1	
Entrance floor 36												1								
Structure B 32											1	2								
" "36(7)																			2	
Cut 2 - S1																1			1	
S2																			1	
S3									1				1							
S4																1			1	
Cut 3 S1											2								1	
S2													1							
S3																			1	
Cut 12											2	1							1	
Structure G-32																				
" H											2	1	1				2			
" E-32											7	3				1				
" E-36(2)																1				
" F-32												1								
" C-32											1	1			2				1	
" C-36(6)																			1	
Mound J Cut 13 - S1																			1	
Cut 1																		1		
House A - floor											1		1			1				
Mound D Cut 7 - S2															1					
S3																1				
S4																1			1	
Mound C - House roof																			1	
Mound C House floor																1			2	
Mound R - House A floor																			1	
Mound H Cut 9-S3																			1	
S7																			1	
KUGOK Mound A Burial 6															1	1				
Find 14																1				
Find 5																1				
Mound B Find 5																			2	
KUGUSUGARUK (Van Valin)												1			2	10	2		17	

FIG. 34. Tabulation of the provenience of harpoon heads of the different types.

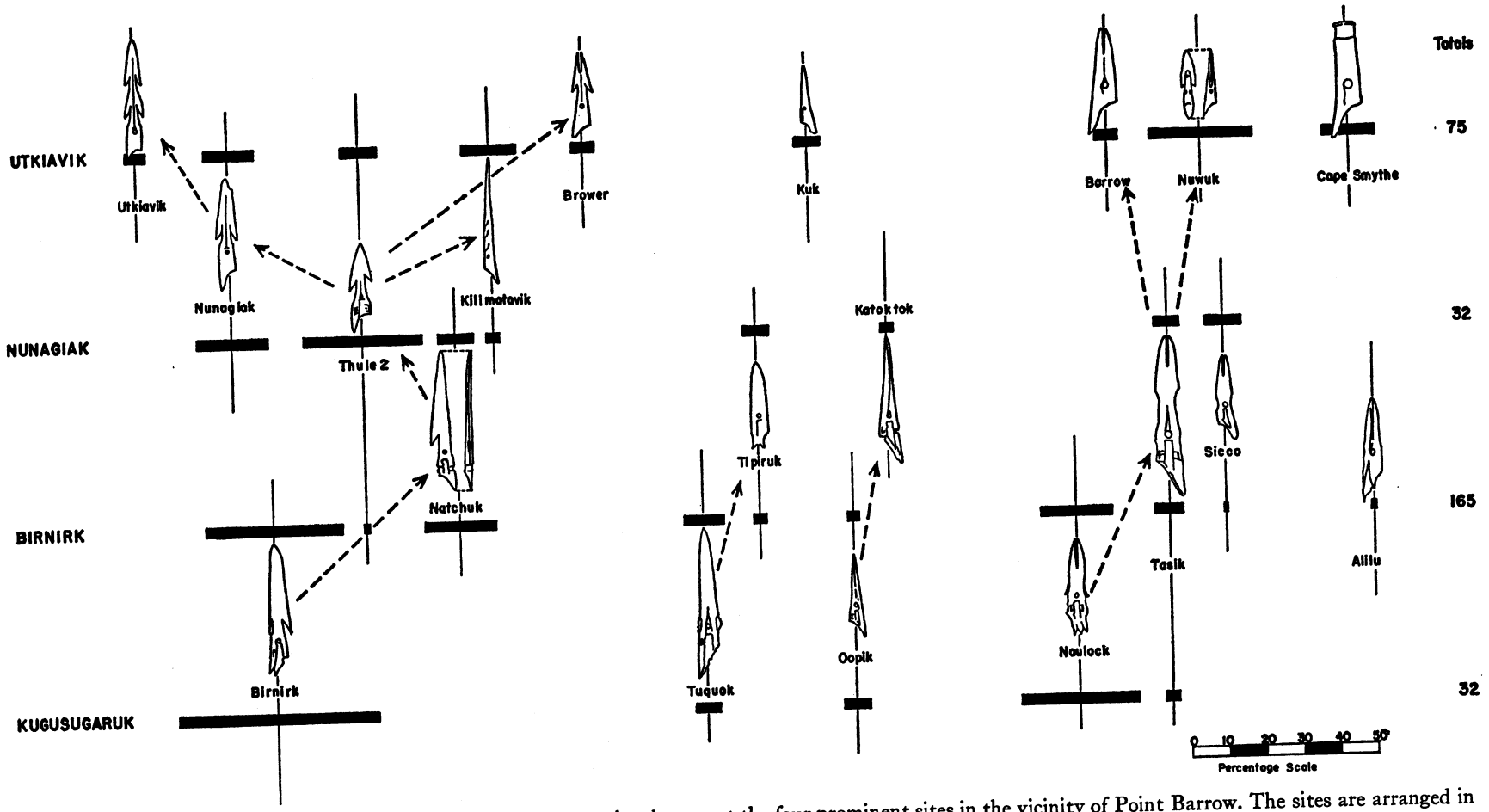


FIG. 35. Diagram showing the relative frequencies of the harpoon head types at the four prominent sites in the vicinity of Point Barrow. The sites are arranged in apparent chronological order from the bottom to the top of the diagram. Arrows formed by dashed lines indicate probable evolution of forms.

earlier collections. This phenomenon is all too familiar in both seriational and stratigraphic studies, as has been discussed at some length elsewhere.[1] It is a limitation that must be recognized in utilizing the data.

In addition to relative quantities, this diagram (Fig. 35) has been arranged to bring together the varieties of harpoon heads that seem to be typologically related, thus providing a basis for deductions as to the evolution of forms. It appears obvious that the popular early harpoon head, Birnirk, has developed into the type named Natchuk by elimination of the single stone side blades (sometimes replaced by an ornamental groove) and by the reduction in the number of points on the spur to one. Similarly, it seems clear that the Thule 2 Type, which reached its maximum popularity of 32 per cent at Nunagiak, evolved from Natchuk by the addition of a second barb to replace the lost stone side blade of the preceding type, Birnirk.[2]

In turn, Thule 2 seems to be the origin of several recent harpoon heads. With closed socket, it becomes the Nunagiak Type which gave rise to the multiple barbed form, Utkiavik. The barbed harpoon head with blade slot, Brower, also stemmed from Thule 2. Less direct in relationship is the multiple barbed closed socket head that is flattened on one side and here called Kilimatavik.

This is the most popular group of harpoon heads in the Point Barrow sequence until the introduction of the modern forms during the occupation of Utkiavik.

Second in popularity in the Point Barrow sequence is a family of harpoon heads that begins with the Type Naulock, a group that has the blade slit in the same plane as the line hole. Tasik Open Socket seems to evolve out of Naulock by simplification of the form, elimination of the simple decoration, and reduction to one of the number of points on the spur. A similar type, Sicco, is slightly more ornate than Tasik and is found mainly at Nunagiak. This probably is an importation into the Point Barrow Area from the vicinity of Bering Strait and is not a direct result of local evolution.

The two closed socket forms that are at present in use, Barrow and Nuwuk, resemble Naulock in the orientation of blade slit and line hole. They are quite similar to types recently in use in the northern Bering Sea Region and doubtless are the result of a simultaneous development on Seward Peninsula and St. Lawrence Island. I do not wish to suggest in Fig. 35 that these two types developed directly from Tasik; the closed socket principle was in use from earliest Old Bering Sea times on St. Lawrence Island, as is shown below.

Two minor developments of harpoon heads also seem to be obvious. The Type Tipiruk developed from Tuquok through the elimination of the stone side blades. At the same time, a similar development changed the form with stone side blades in the plane of the line hole, Oopik, into the rather rare Type Katoktok. The barbless harpoon head, flat on the side opposite the spur, which has been named Kuk, is related to the flat, multiple-barbed form, Kilimatavik. The immediate source of this tendency towards the flattening of one side of the harpoon head is not apparent.

More detailed discussion of this development and comparison with the St. Lawrence Island and Thule Culture sequences can be found in the concluding section.

Harpoon Blades

Utkiavik: The blades from the recent sites of Utkiavik and Nuwuk fall into three classes. Those with fluted faces (Fig. 36c) are fairly common. In the most popular class the beveling near the point widens so that the bevels from the two edges meet at a median ridge (Fig. 36b) which extends from one-quarter to one-half of the length of the blade. Blades from these late sites tend to be larger than the earliest form. A minor proportion of the blades conform to the type from the Birnirk Site (Fig. 36a) described below.

Nunagiak: Twenty-nine harpoon blades were obtained from Nunagiak. Of these, 27 are similar to the blades described below from Birnirk. Two, however, have wider beveled edges, and the faces are fluted (Fig. 36c).

Birnirk: The fact that most harpoon heads from Birnirk did not require blades probably explains why the excavations yielded only 14 recognizable harpoon blades of slate. These are a fine-grained gray-blue slate, basically triangular in outline, but curved along the cutting edges (Fig. 36d). The blades are small, averag-

[1] Phillips, Ford, and Griffin, 1951, 231–236.

[2] This apparent development may be misleading, as is discussed on page 233.

ing 3 cm. long by 1.5 cm. wide. The bases are quite thin, from 1 to 2 mm., but most of them thicken gradually towards the point and are thickest just below the beveled edge. As can be seen from the illustration, the faces are flattened, and the beveling of the edge is quite narrow and is the same width along the cutting edges.

COMPARISONS: Blades from the two latest sites tend to be slightly larger than those from Birnirk. While only fine-grained blue slate was used at Birnirk and Nunagiak, two new varieties of slate appear at Utkiavik and Nuwuk. One is green of a slightly coarser grain. The other is a distinctive fine-grained reddish slate. The sources of these varieties of slate are not known, but it is interesting to note that reddish slate is among the varieties used for harpoon blades at Naujan, one of the earliest Thule Culture sites.[1] It is also true that the most popular type of blade from Utkiavik and Nuwuk, that with the bevels widened until they meet near the point, is the prominent type at this same site.[2]

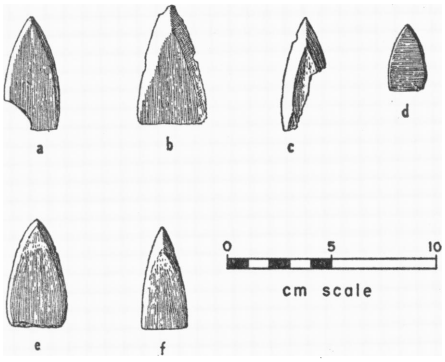


FIG. 36. Varieties of harpoon head blades found in the Point Barrow Area. a, d-f. Thin blades typical of earlier deposits but also found in limited frequencies at the late sites. b-c. Blades with wide edge facets, fluted to receive the prongs of the harpoon head, are confined to the late sites.

The gray slate harpoon blades characteristic of the Birnirk Site resemble blades from Old Bering Sea and Punuk Period deposits on St. Lawrence Island.[3]

[1] Mathiassen, 1927a, 32.
[2] Mathiassen, 1927a, Pl. 7.
[3] Collins, 1937, 147–148, Pl. 39, Figs. 1–5.

FORESHAFTS

UTKIAVIK-NUWUK: There are three varieties of foreshafts in the collection. Two, found in House A, Utkiavik, are simple rods tapered towards the ends, similar to the usual form at Birnik (Fig. 37f). Short foreshafts, about 10 mm. long, round in section, and symmetrical, with shoulders on the end that fit into the socket piece (Fig. 37g), are most common. Both single and paired holes were used for the securing string. This form is similar to that used in historic times in the Bering Strait Region.[4] The third type is represented by a single example from House B, Utkiavik, an antler foreshaft 46 cm. long and 1.4 cm. in diameter. This has a rounded point for a closed socket harpoon. Near the blunt, unshouldered base are two holes for the securing string (Fig. 37h).

NUNAGIAK: The two foreshafts from Nunagiak resemble the most common type from Birnirk (Fig. 38h). One of these has a small perforation; the other does not. Both have flattened distal ends and were used with open socket harpoon heads.

BIRNIRK: Only five harpoon foreshafts were found. One was of ivory; the others were of bone. Four of the foreshafts are slender rods only 14 to 17 cm. long. They are straighter on one side than on the other, are irregularly oval in mid-section, and round at the ends (Fig. 40c–e). Only one has a small hole for attaching a string to tie the foreshaft to the harpoon.

The long foreshaft (33.5 cm.) illustrated in Fig. 40f is made of ivory and comes from below the roof of House A, Mound A, Birnirk. The distal end is a flattened oval in cross-section, evidently intended for an open socket harpoon head.

COMPARISONS: Birnirk foreshafts are very similar to those described by Collins as Type 1 from the St. Lawrence Island Miyowagh Site,[5] but they differ from the foreshafts of the later Punuk Period. They tend to be longer and have relatively large holes for the string used to secure the foreshaft.

Birnirk Type foreshafts with small holes were found by Mathiassen at Naujan and are considered by him to be an old type that disappeared early from the Central Region.[6]

[4] As an example, see Collins, 1937, Pl. 73, Fig. 3.
[5] Collins, 1937, 125, Pl. 31, Figs. 1–5.
[6] Mathiassen, 1927b, 32.

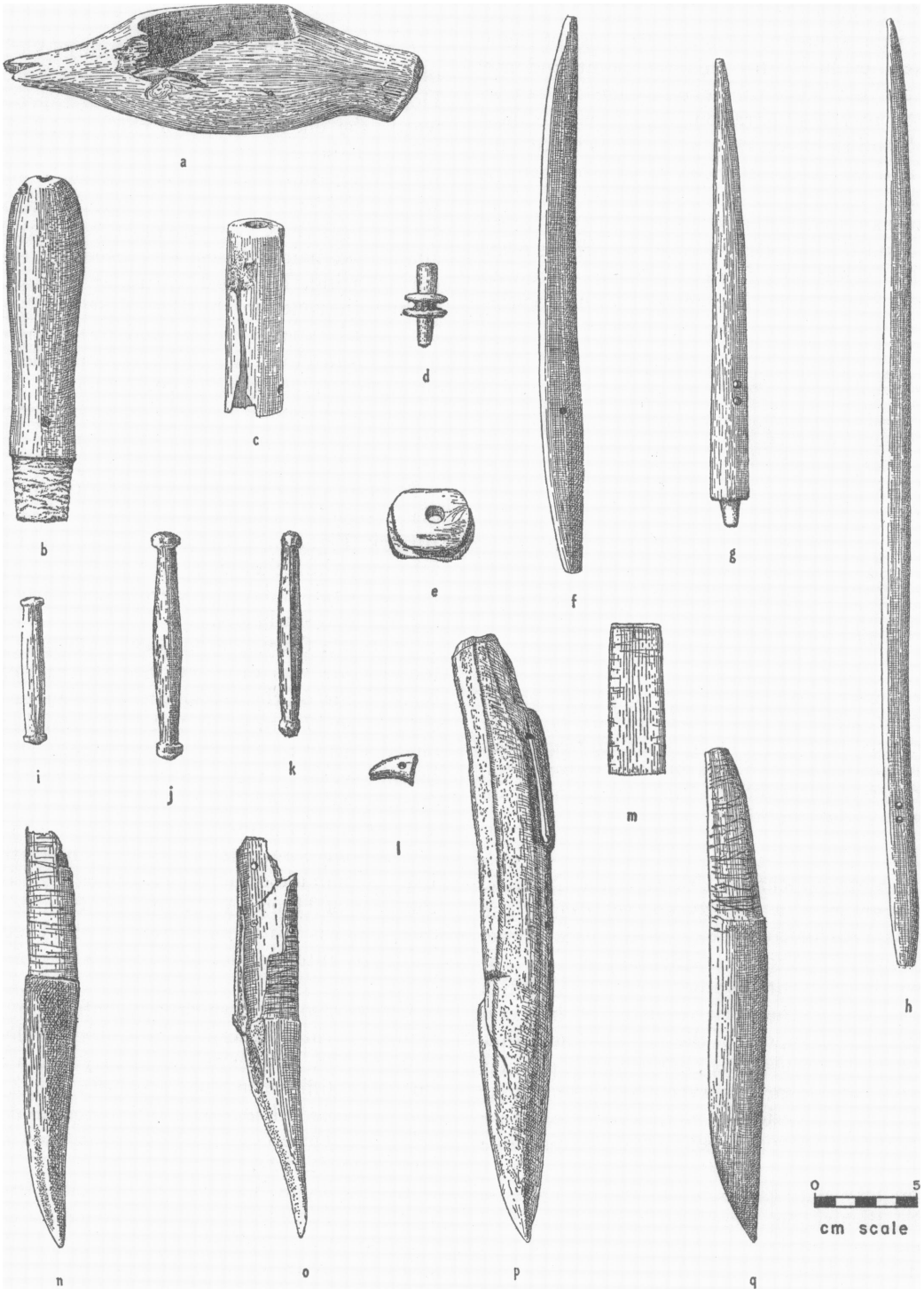


FIG. 37. Harpoon gear from Nuwuk and Utkiavik. a. Wooden box for harpoon blades. b–c. Bone socket pieces for harpoon shaft. d–e. Inflation nozzles for sealskin float. f–h. Foreshafts. i–k. Wood float bars. l. Finger rest for harpoon shaft. m. Antler plate for reënforcing splice in harpoon shaft. n–q. Antler ice picks for butt of harpoon shaft.

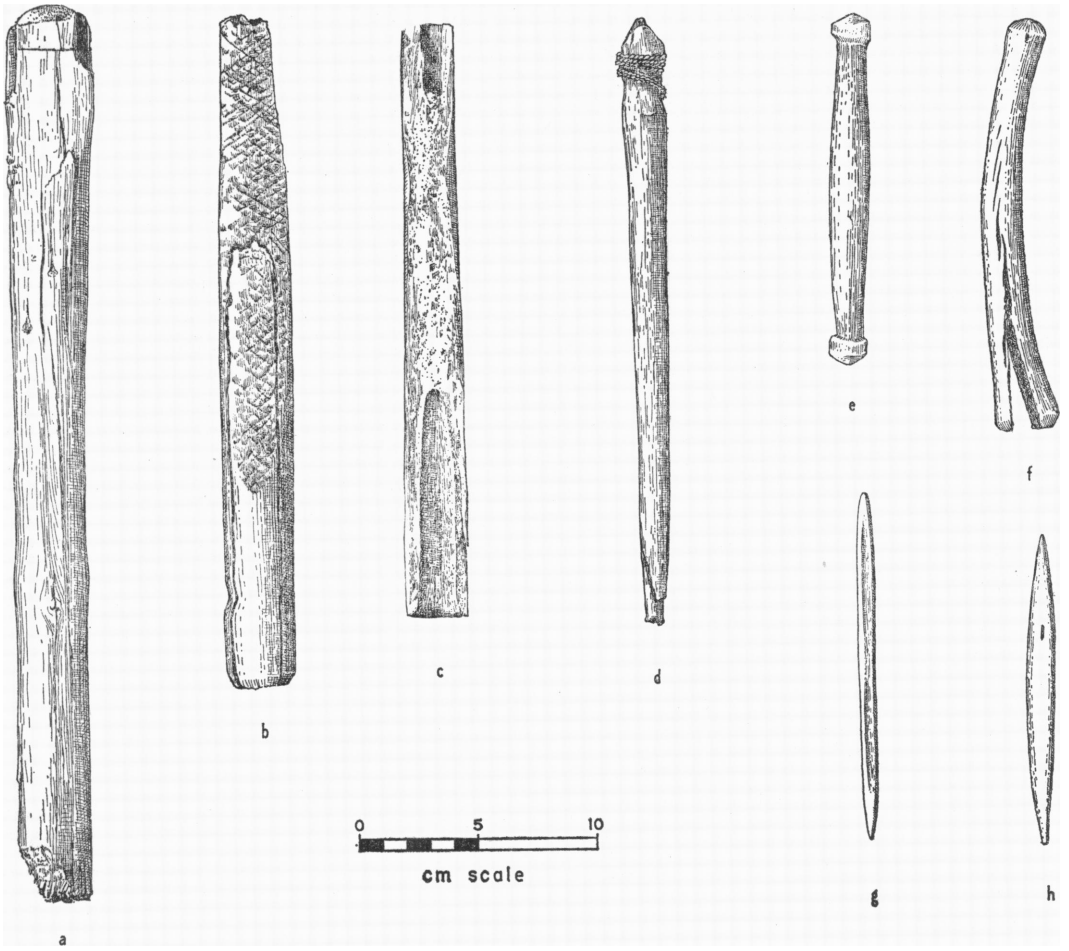


FIG. 38. Harpoon gear from Nunagiak. a. Wood lance shaft with slit for stone point. b. Portion of harpoon shaft showing splice scarf with tongue that engages similar tongue in meeting face. c. Bone socket piece for darting harpoon. d. Detachable lance head for harpoon. e–f. Later and earlier forms of float bars. g–h. Bone harpoon foreshafts.

HARPOON SOCKET PIECES

Murdoch differentiates between the heavy harpoon used for walrus and large seal and the lighter weapon of essentially the same shape which was used for ordinary hair seal. These were darted by hand, not by means of the throwing board. The socket pieces for both types of harpoon were of essentially the same shape, differing only in size.[1] The typical socket piece is described as made of ivory, 6.7 inches long, somewhat club-shaped, with a wedge-shaped tang that fitted a cleft in the end of the harpoon shaft.

[1] Murdoch, 1892, 223 ff. Murdoch used the term "foreshaft" for the socket piece, a term now applied by most writers to what he called the "loose shaft."

UTKIAVIK: No socket pieces were found in the excavations at Utkiavik. The collection purchased from this locality contained six complete and fragmentary socket pieces of the variety described by Murdoch (Fig. 37b). One was made of antler; the others were of bone. In addition, there are three socket pieces considerably shorter than those described by Murdoch, and at the proximal end each had a socket into which the harpoon shaft fitted. One specimen had a drilled hole for a securing pin (Fig. 37c).

NUNAGIAK: Only three socket pieces were found. The bone specimen (Fig. 38c) is round in section, 3 cm. in diameter, and 40 cm. long. It has a socket in the base that has been split open. The other two had wedge-shaped tangs.

BIRNIRK: Evidently it is an example of bad luck that no harpoon socket pieces were found at Birnirk. Five short foreshafts were found, and it is difficult to understand how these might have been used without socket pieces.

COMPARISONS: Harpoon socket pieces with essentially the same features, but differing of course in details of shape and decoration, are known from the Okvik,[1] Old Bering Sea,[2] Punuk,[3] and Recent periods on St. Lawrence Island. A major change occurs in the Punuk Period: the earlier roughened conical tang is replaced by the wedge-shaped tang that continues in use until modern times.

At the Old Kotzebue Site on the Kobuk River, Giddings found an antler socket piece with a wedge-shaped tang[4] (tree-ring date, 1400 A.D.). Other socket pieces from Ekseavik of the same date, and the earlier Ahteut sites, have socketed bases to receive the harpoon shaft.

Socket pieces of the Ipiutak phase at Point Hope are not directly comparable to those discussed here. Nine socket pieces comparable to the wedge tang variety at Utkiavik were secured from the Tigara burials.[5]

Mathiassen defined three types of socket pieces for the Thule Culture sites of north-central Canada. The first type, a socket piece made of a heavy solid piece of bone, bulbous on one end, and with a "scarf" for attachment to the shaft, is directly comparable to the most common recent Point Barrow socket piece, as Mathiassen does not fail to point out.[6] The second type is tubular and directly comparable to the recent socketed foreshafts from Utkiavik and Nunagiak (Figs. 37c, 38c). The third Thule type, little more than a bone ferrule, is late, according to Mathiassen, and continued in use into contact times among most of the Central Eskimo.

HARPOON SHAFTS AND METHODS OF SPLICING AND REËNFORCING

Murdoch describes the typical walrus harpoon shaft as 71 inches long and tapering from 1.5 inches in diameter near the socket piece to 0.8 of an inch at the butt. The seal harpoon that he described was 4 feet 5 inches long and 1 inch in diameter.[7] Apparently none of the harpoon shafts he collected were spliced; most of them were made from hard woods that had been secured from ships.

UTKIAVIK: No examples of harpoon shafts were found. Four small curved antler plates are apparently reënforcements for splices in shafts about 3 cm. in diameter, probably the harpoon shaft. These plates are roughened on the exteriors to retain the lashing. One has small retaining ridges at the ends; the others lack this feature (Fig. 37m).

NUNAGIAK: Two harpoon shaft fragments were obtained. One, accompanying Burial 1 below Mound C, was about 3 cm. in diameter and had no unusual features. The other, picked up on the lagoon beach below Mound C, is oval in section, 2.2 by 3 cm. (Fig. 38b). A long scarf face for a splice has been roughened by criss-cross knife cuts. A tongue of wood has been lifted in the center of this scarf face to engage a similar tongue in the meeting piece, as is described for specimens from Birnirk.

BIRNIRK: Two fragments of harpoon shafts were identified from the lower levels of Mound A. Both are round, 2.5 and 2.8 cm. in diameter, carved from spruce driftwood, and both have holes in one end to receive the roughened conical tangs of the Birnirk type of ice pick described below (p. 102). The more interesting longer fragment consists of two pieces that illustrate an ingenious method of splicing (Fig. 40a–b). In the longer section, 65 cm. long, the socket for the ice pick tang is at one end and a tapering scarf splice on the opposite end. On the face of this scarf two tongues of wood have been lifted. A short section of shaft that actually gained only 16 cm. for the length of the weapon was found in contact. The two tongues lifted on the face of the scarfs of this section interlock with the tongues on the face of the longer piece, effectively preventing the splice faces from sliding.

Three examples of the curved plates used to reënforce shaft splices found at Birnirk were quite similar to the examples from Utkiavik described above; two had the small ridges at the ends to retain the lashing (Fig. 40g).

COMPARISONS: From the Old Bering Sea

[1] Rainey, 1941, Fig. 10, Items 1–2, 4–7. Item 3 shows every indication of being of recent date.
[2] Collins, 1937, 126–128, Pl. 31, Figs. 11–19.
[3] Collins, 1937, 218, Pl. 73, Figs. 6–7.
[4] Giddings, 1952, 54, Pl. 12, Fig. 1.
[5] Larsen and Rainey, 1948, Pl. 89, Fig. 9.
[6] Mathiassen, 1927b, 33–34.
[7] Murdoch, 1892, 224, 231.

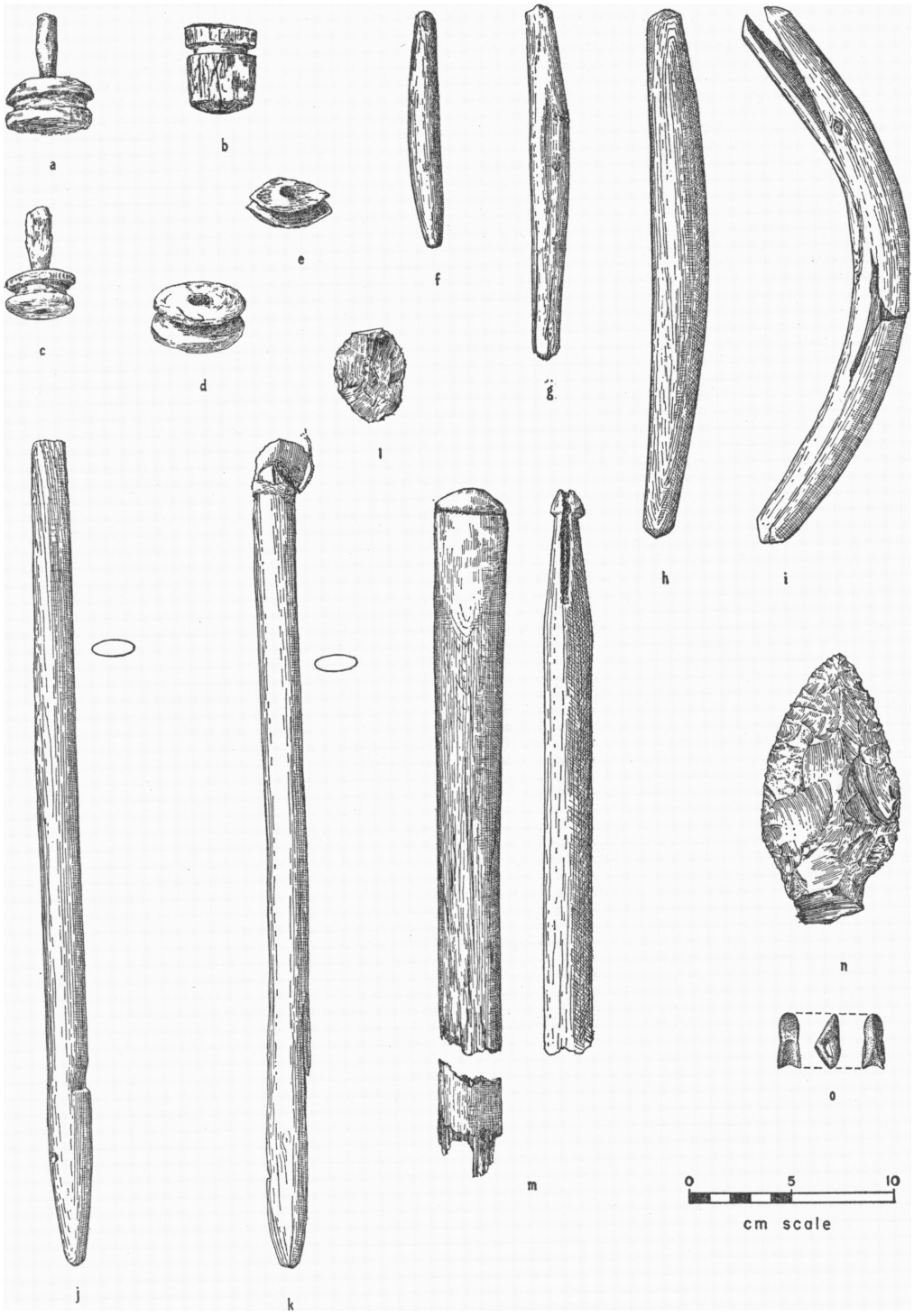


FIG. 39. Harpoon gear from Birnirk. a–e. Wood inflation plugs for sealskin floats. f–i. Birnirk type of wood float bars. j–k. Detachable wood lance heads for harpoon. l. Typical crudely chipped point for detachable lance head. m. End of wood lance shaft. n. Chipped lance point made of gray flint. o. Finger rest for harpoon shaft.

Period deposits at Miyowagh, Collins illustrates a section of an oval harpoon shaft with a socket for the tang of an ice pick or socket piece at one end and splice scarf at the other.[1] It differs from the specimens from Birnirk and Nunagiak described above only in the absence of the tongues on the scarf faces.

Splice reënforcements of exactly the shape described above do not seem to occur in the St. Lawrence Island sequence. Giddings[2] illustrates a single specimen from Ekseavik on the Kobuk River. From the Central Region Mathiassen illustrates a similar object from Anangiarsuk, a site not over a century old.[3] Another was found at the Thule Culture site of Qilalukan.[4] These two objects are identified as bow braces.

Finger Rests for Harpoon Shaft

Utkiavik: An ivory finger rest with a drilled lashing hole rather than a cut slot comes from Level 1, Cut 2, Utkiavik (Fig. 37 l).

Birnirk: Only one harpoon shaft finger rest was found at Birnirk. This was made of ivory and came from Cut 3, Level 7, in Mound A (Fig. 39o).

Comparisons: The Birnirk specimen very closely resembles finger rests that Collins describes as Type 1 from the Miyowagh.[5] It also resembles finger rests secured by Mathiassen from Naujan and the Qilalukan-Mitimatalik find.[6]

Ice Picks for the Harpoon Shaft

Ice picks for the butt of the harpoon shaft are rather common in all the sites and show diagnostic changes in form. For these reasons it seems desirable to describe the types and tabulate the occurrence of each at the several sites.

Type A: Only one type occurs in the Birnirk finds (Fig. 40i–k). It is made of the distal end of the slender tusks of young female walrus. Towards the point, flat facets have been ground to sharpen the picks. Over-all length ranges from 14 to 24 cm. At the proximal end there are a sloping shoulder and a tapering tang made to fit into a socket in the wooden harpoon shaft. One pick of this type was found beneath Mound C at Nunagiak; one made of antler comes from Utkiavik.

These ice picks are identical to those designated as Type 2 from Miyowagh on St. Lawrence Island.[7] The type was used from Old Bering Sea to Punuk times, but does not occur in the Thule finds described by Mathiassen.

Type B: Harpoon ice picks of this type are usually made of antler, less often of walrus penis bone. The distal end is pointed; a socket to receive the round shaft is carved at the proximal end. Bone or ivory pins inserted in small holes in the walls of the sockets served to secure the pick to the harpoon shaft. Usually a slight shoulder at the base of the socket prevents the lashing from sliding down towards the point of the ice pick. The over-all length varies from 13 to 33 cm. (Fig. 37n).

This form, found at Utkiavik and Nunagiak, seems to be unique to the Point Barrow Area. Similar ice picks have not been described from the Bering Strait Region or from the Thule Culture of the Central Region. However, the socket principle of attachment was known to the Thule people, for at Naujan it was applied to harpoon socket pieces.[8]

Type C: This is a less specialized ice pick, with a socket base from which Type B possibly developed. These picks, usually of antler, have the cancellous tissue removed at the proximal end, forming a shallow socket against which the harpoon shaft lies. The outer surface of the socket is roughened to retain the lashing (Fig. 37o).

This variety of harpoon ice pick is most similar to that described for the Thule Culture.[9]

Type D: Only two examples of this type of ice pick were found, one at Nuwuk and one at Utkiavik. They are crudely shaped of antler, 27 and 29 cm. long. The distinctive feature is the method of attachment. The flat area of attachment has a series of drilled holes or a slot through which the lashings were passed (Fig. 37p).

Type E: Two ice picks of this variety, made of antler, 27 and 28 cm. long, were included in purchased collections from Nuwuk. At the proximal end is a tapering, wedge-shaped scarf that is received into a V-shaped scarf cut into the end of the harpoon shaft. One has small

[1] Collins, 1937, 126, Pl. 46, Fig. 15.
[2] Giddings, 1952, 125, Pl. 43, Fig. 21.
[3] Mathiassen, 1927a, 128, Pl. 38, Fig. 7.
[4] Mathiassen, 1927a, 154, Pl. 42, Fig. 4.
[5] Collins, 1937, 129, Pl. 32, Figs. 9–12.
[6] Mathiassen, 1927a, 29, 151, Pl. 5, Fig. 3.
[7] Collins, 1937, 128–129, Pl. 32, Figs. 3–4.
[8] Mathiassen, 1927a, Pl. 3, Fig. 9.
[9] Mathiassen, 1927a, 29, Pl. 4, Figs. 2–6.

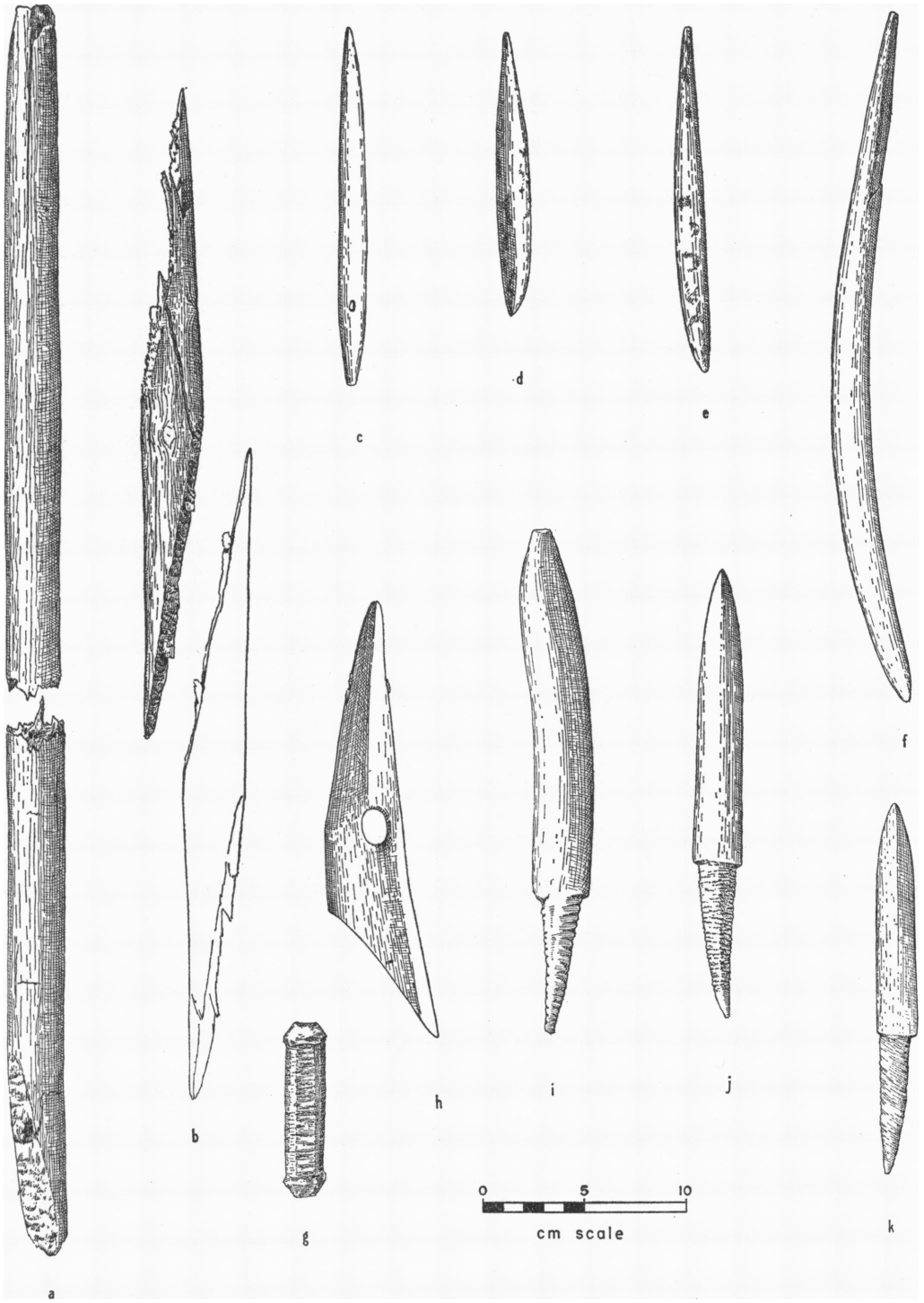


FIG. 40. Harpoon gear from Birnirk. a–b. Sections of harpoon shaft showing splicing scarfs with two meeting tongues. (The upper end of a is hollowed to receive the conical tang of either ice pick or socket piece.) c–e. Bone foreshafts. f. Ivory foreshaft. g. Plate for reënforcing shaft splices. h. Bone whale harpoon head with leather pad for blade in blade slit. i–k. Ivory ice picks for harpoon shaft.

knobs formed on the side of the scarf as an aid in retaining the lashings (Fig. 37q).

Among the specimens Murdoch collected at Barrow,[1] he illustrates a socket piece attached to the shaft in this fashion. An ice pick of this same type from modern burials at Point Hope is illustrated by Larsen and Rainey.[2] Obviously, this is a very recent method of attachment.

SEQUENCE OF HARPOON SHAFT ICE PICKS

The several forms of ice pick occur in the frequencies shown below. This clearly demonstrates that the picks of Type A, usually made of ivory, are the oldest in this series. The exact sequence of the other types is not clear, but they all seem to have come into use after the abandonment of the Birnirk Site.

	Types				
	A	B	C	D	E
Nuwuk				1	2
Utkiavik	1	7	5	1	
Nunagiak	1	3			
Birnirk	15				

LANCE AND LANCE POINTS

In addition to deer and bear lances, Murdoch describes the lances used to dispatch harpooned whales and illustrates four of the flint heads for such lances. These are crudely chipped of gray, bluish gray, or black flint and have bluntly pointed ovate blades and wide straight stems. One specimen for which a scale is provided measures 17 cm. long by 8 cm. wide.[3]

NUNAGIAK: A basal fragment of what may be a stemless chipped lance point was obtained from Section 3, Cut 2. More positive evidence of the occurrence of this weapon is a 37-cm.-long fragment of the wooden shaft of such a lance (Fig. 38a). It is oval in cross-section and has a slot in the end shaped to accommodate a chipped blade. A ridge prevents the lashing from slipping off.

BIRNIRK: Two chipped flint blades found at Birnirk seem to conform both in shape and size to Murdoch's description of whale lances. One of black chert from the upper levels of Mound A is 13.4 cm. long, has a triangular blade 7 cm. wide and a tapering stem (Fig. 39n). It is rather thick in section (about 2.5 cm.). The second blade, from the floor of House A, Mound R, is exactly the same length and width as the first, but is stemless and thinner, with a rounded base.

COMPARISONS: Similar lances are used by the historic Eskimo of the Bering Strait Region.[4] In the Thule Culture finds of Canada, fixed lance heads are fairly common, but these seem to have had foreshafts of bone, a feature not found in the Point Barrow collections.[5] Stemmed chipped blades were found in the Old Bering Sea Period deposits on St. Lawrence Island. However, these are smaller than the lance points described above. Collins is doubtless correct in classifying them as knife blades.[6] Large chipped blades with tapering stems were found in house deposits at the Ipiutak Site. Though similar in shape and size, these demonstrate a better quality of workmanship and are thinner than the Point Barrow specimens.[7]

Stemmed and unstemmed lance points, slightly smaller than the Point Barrow specimens, were found at Ambler Island, Old Kotzebue, Ekseavik, and Ahteut on the Kobuk River.[8] Giddings dates the occupation of the last-named site at 1250 A.D. It is the lance points from Ahteut, shown by Giddings (his Fig. 31) that most clearly resemble the weakly shouldered stemmed specimen from Birnirk.

SEAL POKE GEAR

FLOAT BARS

Murdoch does not describe in detail the shape of the bars used on the sealskin floats at Point Barrow. However, he does illustrate a float that obviously has a bar.[9]

UTKIAVIK: The only form of float bar found at the Utkiavik and Nuwuk sites were wooden rods with small knobs on the ends (Fig. 37i–k). There is a single bar of this type (Fig. 38e) from the late deposits at Nunagiak.

BIRNIRK: Wooden bars, 11 to 26 cm. long, occur commonly among the Birnirk artifacts. Their shape is fairly consistent: they are round in section, with the largest diameter at the center, and taper towards the ends. In profile one side is almost straight and the other curved (Fig. 39f–h). Figure 39i is an unusual, strongly

[1] Murdoch, 1892, 230, Fig. 222.
[2] Larsen and Rainey, 1948, Pl. 93, Fig. 11.
[3] Murdoch, 1892, 240–244, Figs. 239–240.
[4] Nelson, 1899, Pl. 55, Fig. 4.
[5] Mathiassen, 1927b, 36–37.
[6] Collins, 1937, 148–149, Pl. 40.
[7] Larsen and Rainey, 1948, 103, Pl. 14, Fig. 18.
[8] Giddings, 1952, Pl. 1, Figs. 16–18, Pl. 12, Fig. 11, Pl. 28, Fig. 16, Fig. 26, Fig. 27, Item 1, Fig. 31.
[9] Murdoch, 1892, Fig. 249.

curved float bar. These bars were lashed to the neck end of sealskins and served to toggle the float onto the harpoon line.

COMPARISONS: Collins is probably correct in saying that some similar objects he illustrates from Miyowagh performed the same function.[1] These, however, differ from the Birnirk specimens, for some are made of ivory, and all those illustrated have wide shallow grooves at the center. However, the profile is identical.

The knobbed-end wood float bar that appears at the late sites is widely distributed. Mathiassen describes this type from Naujan and Anangiarsuk, sites of the Central Canada Thule Culture.[2] The earliest occurrence of this form seems to be in the Punuk stage on St. Lawrence Island.[3] Possibly this form of toggle came into the developing Thule Culture from the Bering Strait Region.

SEAL FLOAT MOUTHPIECES

NUNAGIAK: Among the goods that accompanied one of the burials at the base of Mound C at Nunagiak was an oval inflation plug made of ivory that has one face decorated with a simple incised design (Fig. 21h). A wooden stopper for one of these nozzles comes from the fourth level of Cut 4 at this site. This was accompanied by items of undoubted Punuk Type, so probably was not made locally.

BIRNIRK: The inflation plugs from Birnirk, all made of wood, are round and from 2.5 to 4.5 cm. in diameter (Fig. 39a, c–e). They are deeply grooved about the periphery where the mouthpiece is lashed to the skin. The inflation hole is small. Two of the plugs had wooden stoppers in place (Fig. 39a, c).

COMPARISONS: These large round and oval inflation plugs are similar to the bone and ivory plugs that first appear in the latter part of the Old Bering Sea Culture phase on St. Lawrence Island.[4] If we can judge by the evidence provided by the Barrow collections, float plugs of this type become less popular in this area, for there is only one from the later sites. This parallels the sequence on St. Lawrence Island where this form disappeared in Punuk times.[5]

[1] Collins, 1937, 131, Pl. 47, Figs. 5–7.

[2] Mathiassen, 1927b, 36. See the footnote that summarizes use of this form of toggle in historic times from Greenland to Siberia.

[3] Collins, 1937, 221, Pl. 73, Fig. 20.

[4] Collins, 1937, 130, Pl. 32, Figs. 13–15.

[5] Collins, 1937, 220.

Large plugs of this type are not present at the Thule Culture sites described by Mathiassen. Perhaps they were partially replaced by the elongated tubular type used for the bladder dart, which is discussed below together with other bladder dart equipment. However, they were found by Collins[6] at Frobisher Bay in Thule context and by Holtved[7] in northwest Greenland.

SEAL FLOAT PLUGS

A single wooden plug used to close small holes in sealskin floats was found in Mound A, Birnirk. This is 2 cm. in diameter, has a knob at one end, a shallow groove, and is round in section (Fig. 39b). None of the oval plugs common in the late Old Bering Sea levels on St. Lawrence were found.[8]

DETACHABLE LANCE POINTS

NUNAGIAK AND BIRNIRK: Detachable lance points for use with the harpoon are fairly common at Birnirk, but were not found at the late sites. There are 13 wooden shafts, some with stone points in place. In addition, 11 of the distinctive points were found. One lance shaft was obtained from Nunagiak. The wooden shafts range from 37 to 41 cm. in length and are flattened oval in cross-section. One end has a slot cut to hold the stone blade which is bound in place with braided sinew (Fig. 39j–k). The stone blades are crudely chipped ovals about 4 cm. in diameter. About half of them are made of spalls knocked off pebbles and dressed into form, with the cortex left on one face. The remainder are chipped on both faces. Had these blades not been found in the lance heads they probably would have been mistaken for a form of scraper (Fig. 39 l).

The proximal end of the lance heads is dressed to a conical point which fits into the hole in the socket piece of the harpoon that normally receives the foreshaft. A shallow notch on one edge of the lance, a few centimeters forward of the butt, serves to retain the line used to hold the lance point in place on the harpoon. On one specimen from Mound A, House H, a fragment of sealskin line was tied above this notch in a clove hitch.

[6] Collins, 1950, Pl. 6, Fig. 7.

[7] Holtved, 1944.

[8] Collins, 1937, Pl. 32, Fig. 16.

COMPARISONS: Mason illustrates one of these lance points from Van Valin's excavation at Kugusugaruk.[1] A single similar wooden lance point was found in the late Old Bering Sea Period deposits near Gambell on St. Lawrence Island.[2] As Collins points out, Nelson describes a similar lance point for the historic Bering Strait Eskimo.[3]

Mathiassen refers to this class of weapon as "movable lance heads." Only one was found in the Thule Culture site of Qilalukan. This has not only two slate side blades but also an end blade and two holes for the thongs used to hold it on the harpoon. He discusses the distribution of similar lance points in Greenland, Baffin Island, and Labrador, and one example Rasmussen obtained at Point Barrow.[4]

OTHER ICE HUNTING GEAR

WOUND PLUGS

BIRNIRK: In the sequence represented by the series of sites in the vicinity of Point Barrow, there seems to have been little change in the form of the wooden plugs carried by hunters to plug the wound of seals and other animals and so conserve the blood in the carcass. Nelson also describes the use of these plugs to hold the air blown under the skin of a seal to make it float.[5] These are blunt-pointed tapering pieces of wood from 7 to 9 cm. long, flattened ovals in cross-section. Most of the plugs have an encircling groove at the large end. A small hole at the point end served for tying the plugs in bundles when not in use (Fig. 41b). A bundle of seven plugs on a baleen string was found on the floor of the entrance to House A, Mound A, at Birnirk. A small ivory pin is set into the larger end of an isolated plug from Cut 12, Mound A. This pin apparently served no function and was intended either for decoration or possibly for identification (Fig. 41a).

Seventeen wound plugs were recovered from Birnirk, but they are rare at the later sites: only one from Nunagiak and one from Utkiavik. I am uncertain as to the significance of these figures. Murdoch does not mention these wound plugs, but they certainly continued in use until historic times in the Bering Strait Region.

[1] Mason, 1930, Pl. 1.
[2] Collins, 1937, 126, Pl. 57, Fig. 1.
[3] Nelson, 1899, 147, Pl. 57.
[4] Mathiassen, 1927b, 37–38.
[5] Nelson, 1899, 131, Pl. 52, Fig. 19.

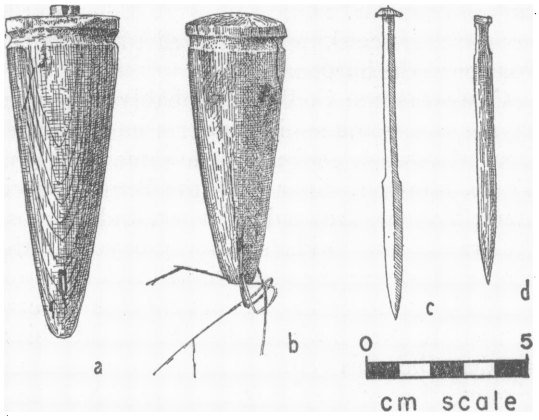


FIG. 41. Wound plugs and pins from Birnirk.

COMPARISONS: Similar wound plugs made of wood are reported throughout the entire St. Lawrence Island chronology.[6] Strangely enough, this element apparently does not occur in the Thule Culture. The objects that Mathiassen lists as "wound plugs" are wound pins, which are discussed below. However, Holtved found a true wound plug in the Thule District of northwest Greenland.[7]

WOUND PINS

Wound pins made of either bone or ivory have essentially the same form at Birnirk, Nunagiak, and Utkiavik. They range from 6 to 10 cm. in length. The shafts are diamond shaped in section, and the edges are sharp. A small knob forms the head (Fig. 41c–d). This item does not seem to have been an element of the Bering Strait chronology. It is, however, fairly common in the Thule Culture sites of the Central Region.[8] Similar wound pins are still used by the Central Eskimo.

ICE SCOOPS

Murdoch collected this common Eskimo implement at Point Barrow and described and illustrated it.[9] The rim of the scoop, made of a thin strip of antler, about 2 inches wide, was bent into an oval and lashed to the handle. Baleen netting formed the bottom of the implement. A characteristic feature is a slight projection or lip on the rim opposite the point of attachment of the handle.

[6] Collins, 1937, 357.
[7] Holtved, 1944, Pl. 9, Fig. 7.
[8] Mathiassen, 1927b, 40–41.
[9] Murdoch, 1892, 308–309, Fig. 310.

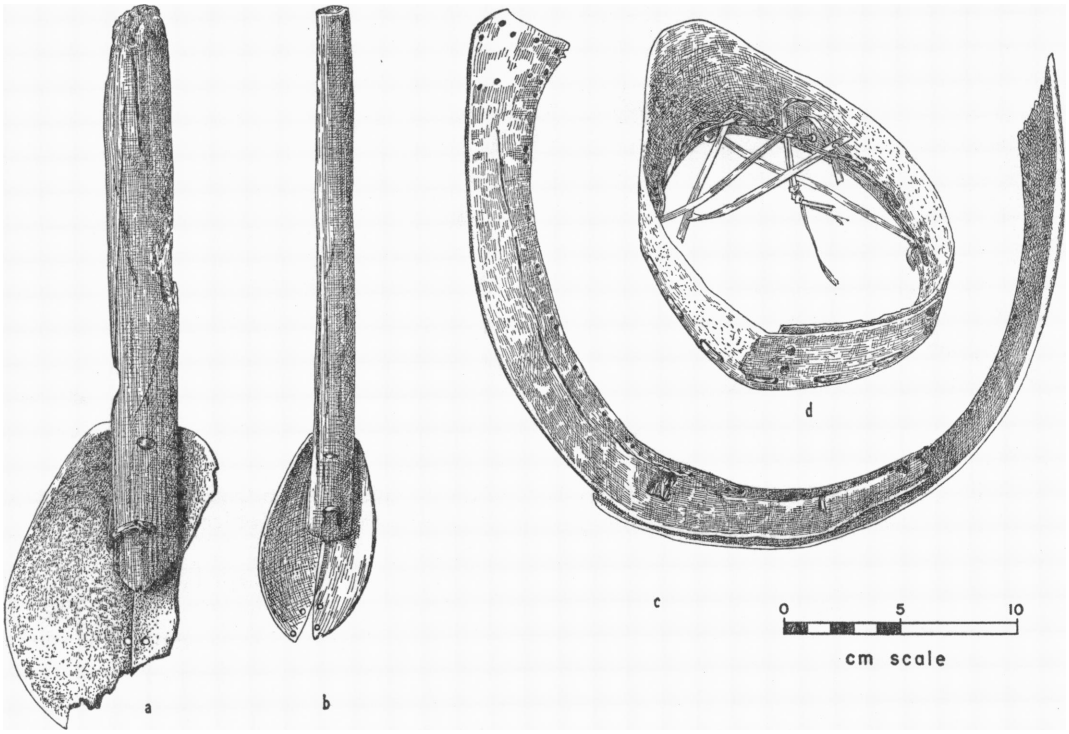


FIG. 42. Ice scoops from the recent sites. a–b. Two-piece ladle type of scoop made of antler with wood handles. c–d. Scoops with antler rims and baleen netting.

UTKIAVIK: The rims from ice scoops obtained at Utkiavik, Nuwuk, and the recent deposits at Nunagiak were of two forms, both made with thin, but fairly wide, slabs of antler. One variety (Fig. 42d) is exactly like the specimen described by Murdoch; the other differed in that the rim is formed of two strips of antler lashed together at the handle and at the lip (Fig. 42c).

BIRNIRK: The handled scoop for removing chips from a hole being cut in the sea ice is a characteristic feature of the Birnirk collection. The rims of seven of the scoops are made of single thin strips of antler about 3 mm. thick and 2 to 3 cm. wide. Holes are provided at the ends of the strips for lashing to the handle, and slots, in a row near the bottom edge, are for the netting. The diameters are not very large, averaging about 18 cm. (Fig. 43b). One scoop from the floor of House A, Mound C, has narrow baleen strips attached to it, arranged in a three-element open plaiting.

Another type of ice scoop has a rim made of a baleen strip about 3 cm. wide, with a knotless netting, also of baleen, formed by running loops (Fig. 44).

The objects illustrated in Fig. 43c–d were not identified until a more complete specimen was noted among the finds illustrated by Rudenko from the Sirhenik Site in Siberia. This dates from the Old Bering Sea and Punuk periods.[1] These thinned objects, made from antler palm, are bottom pieces for ice scoops. The scoops had antler rims like that shown in Fig. 43b. Baleen netting passed through the cut slots to connect the bottoms with the rims. The piece of antler shown in Fig. 43c forms the lower portion of the handles as well as the bottom of the scoop. Two bone pins are passed through the handle to secure it to a wooden extension.

COMPARISONS: The two baleen rimmed scoops described above are similar to the Old Bering Sea Period type from St. Lawrence Island. Simple looped netting was used.[2] This type continued in use into the Punuk Period

[1] Rudenko, 1947, Pl. 28, Fig. 3.
[2] Collins, 1937, 171, Pl. 55, Fig. 7.

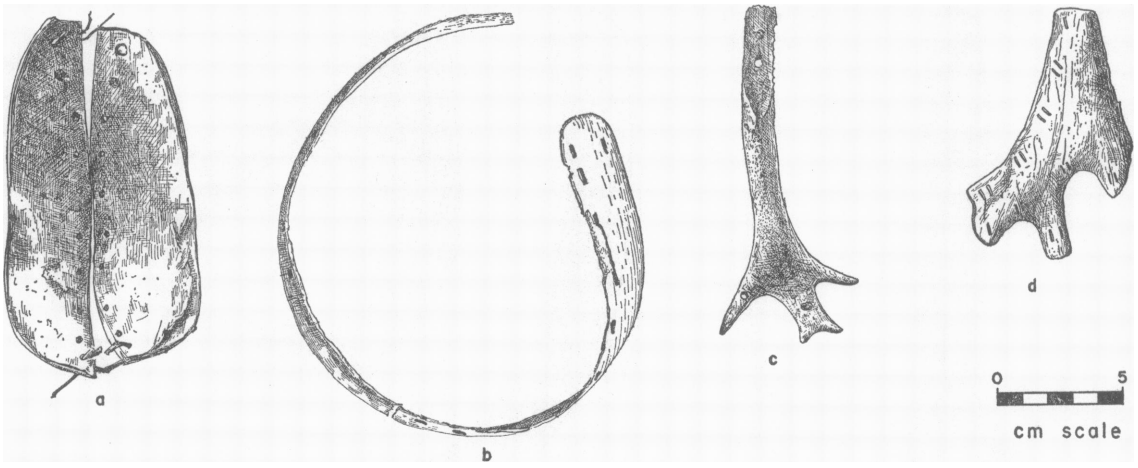


FIG. 43. Ice scoop parts from Birnirk. a. Baleen bowl of the two-piece type b. Narrow antler rim of the earlier type of scoop. c–d. Antler plates worked into the netting of ice scoops.

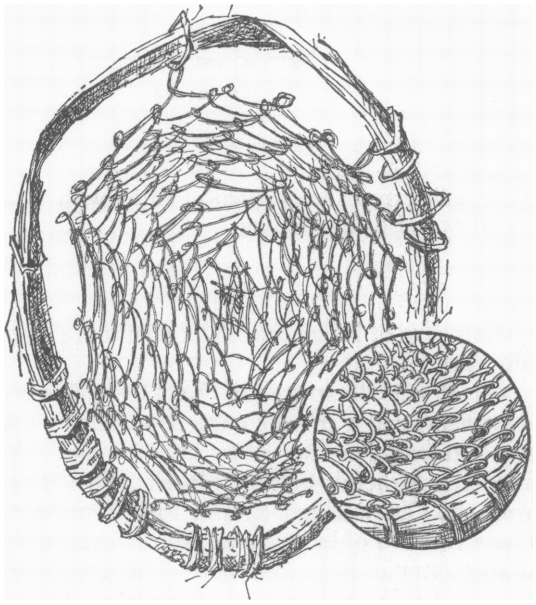


FIG. 44. Ice scoop with baleen rim and netting from Birnirk.

and on St. Lawrence until modern times.[1]

The netted ice scoop with a horn rim is not listed as part of the Thule Culture and apparently was not used by later peoples of the central and eastern Arctic.

TWO-PIECE ICE SCOOP

Figure 42a–b shows ladles made by two pieces of antler, baleen, or horn cut in such a way that when they are lashed together they curve as does the bowl of a spoon. The lashed halves are then tied to a wooden handle. Evidently this utensil was not very popular at Birnirk, for only two of them were found (Fig. 43a). One was made of a single piece of antler partially split down the center. This form of ladle becomes more popular at the later sites: one was found at Nunagiak, 10 were found at Utkiavik, and five at Nuwuk.

This type of ladle remained in use until historic times. Following a good description, Murdoch explains its use:

> In addition to the use of these scoops for skimming the fishing holes, and reeling up the line, as already described, they also serve as scrapers to remove snow and hoar frost from the clothing. In the winter most of the men and boys, especially the latter, carry these skimmers whenever they go out doors, partly for the sake of having something in their hands, as we carry sticks, and partly for use.[2]

COMPARISONS: On St. Lawrence Island this method of making a spoon seems to have been known, but little used. Two specimens from the Old Bering Sea Period deposits of Miyowagh have the tip slit for a short distance and lashed together to deepen the bowl.[3] Recent ice scoops from the Bering Strait Region seem to have been either the netted type or to have been made of a single piece of bone, such as a scapula, fastened to a stick. From the site of Male-

[1] Geist and Rainey, 1936, Pl. 36, Fig. 3.

[2] Murdoch, 1892, 309.

[3] Collins, 1937, 166, Pl. 51, Fig. 15, Pl. 47, Fig. 16.

rualik, Mathiassen obtained a single ice scoop that is split about halfway down the bowl as are the specimens from St. Lawrence Island.[1]

Seal Killer

Utkiavik: From Utkiavik there are two round stones, 5 and 8 cm. in diameter, with attached leather thongs. One has an encircling baleen cable firmly seated in a shallow groove. The other is encased in a rawhide net to which the thong is attached. These are clubs used to brain seals after they have been harpooned. Apparently this "slungshot," known to be in use in historic times, is not a very old item in the Point Barrow Area.[2]

Drag Line Handles

Handles for the line used to drag in freshly killed seals are usually prominent in Western Eskimo collections. Thus it is surprising that the present collection contains only one, very simply made of wood, with a shallow groove for the line.

Seal Scratcher

Murdoch describes the use of the seal scratcher in decoying seals and illustrates three examples of this instrument.[3] The sixth level of Cut 2 at Nunagiak yielded the handle of a scratcher (Fig. 45h) very similar to those shown by Murdoch. The Van Valin Collection from the old graves at Kugusugaruk contains another seal scratcher handle.[4]

Comparisons: On St. Lawrence Island the seal scratcher first appears in Punuk Period deposits[5] as a long, two-pronged instrument. The multipronged scratchers from Point Barrow are more similar to the two specimens from one of the Thule Culture sites.[6]

Seal Rattles

Murdoch purchased a pair of cottonwood blocks carved into the shape of a seal head, with several ivory bangles attached to it with an iron staple.[7] This is believed to be a rattle that was shaken to arouse the curiosity of seals and attract them to the nets set under the ice. I bought a pair of very similar rattles that were excavated from a recent house at Nuwuk by the Eskimo (Fig. 45i). These also have ivory bangles affixed to the wooden part of the rattle by an iron staple. Nelson illustrates similar objects from Point Hope, but lists them as floats.[8] As far as I can determine, similar rattles have not been obtained from prehistoric sites.

Net Floats, Weights, Shuttles, and Gauges

Gauges and shuttles for the manufacture of nets are fairly common tools in the deposits at Utkiavik and Nuwuk (Fig. 45n, p–q). These conform very closely to Murdoch's description and illustrations.[9] The small fish effigy made of antler (Fig. 45o) apparently is one of the small netting implements that Murdoch describes and illustrates as a "weight." He is somewhat uncertain as to the exact method of use.[10]

A fragment of a net made of baleen strips (Fig. 46) was found in excavations above House A in Mound A at Utkiavik. The mesh measures 5.5 cm. each way. It is probably a gill net intended for fish and not a seal net.

Nunagiak: Equipment and tools indicating the use of nets do not appear in the Point Barrow chronology until the Utkiavik Period. The specimens recovered at Nunagiak were in the later deposits, not in the earlier portions of the midden.

Two types of net floats were found at Nunagiak. One is a flattened wood ball, 8.5 cm. in diameter, with a small hole drilled through one edge to provide a means of attaching it to the net (Fig. 45j). The other is a crescent-shaped piece of wood, 20 cm. from end to end (Fig. 45k).

Net weights are made of short sections of antler, whalebone, or walrus rib (Fig. 45 l–m). Occasionally, they have been carved into a crescent shape. There is always a small hole at each end for the attachment of the weight to the net. Murdoch does not describe net weights, but the same types continued in use until the 1930's.

In historic times the use of nets for both sealing and fishing was widespread among the Eskimo. What seem to be heavy net-sinkers of

[1] Mathiassen, 1927a, 315, Pl. 83, Fig. 3.
[2] Murdoch, 1892, 191, Fig. 173.
[3] Murdoch, 1892, 253–254, Fig. 253.
[4] Mason, 1930, Pl. 1.
[5] Collins, 1937, 322.
[6] Mathiassen, 1927a, 152–153, Pl. 41, Fig. 10; 1927b, 42.
[7] Murdoch, 1892, 254, Fig. 254.
[8] Nelson, 1899, 127, Pl. 52, Fig. 15.
[9] Murdoch, 1892, 312–315, Figs. 315–320.
[10] Murdoch, 1892, 315–316, Fig. 321.

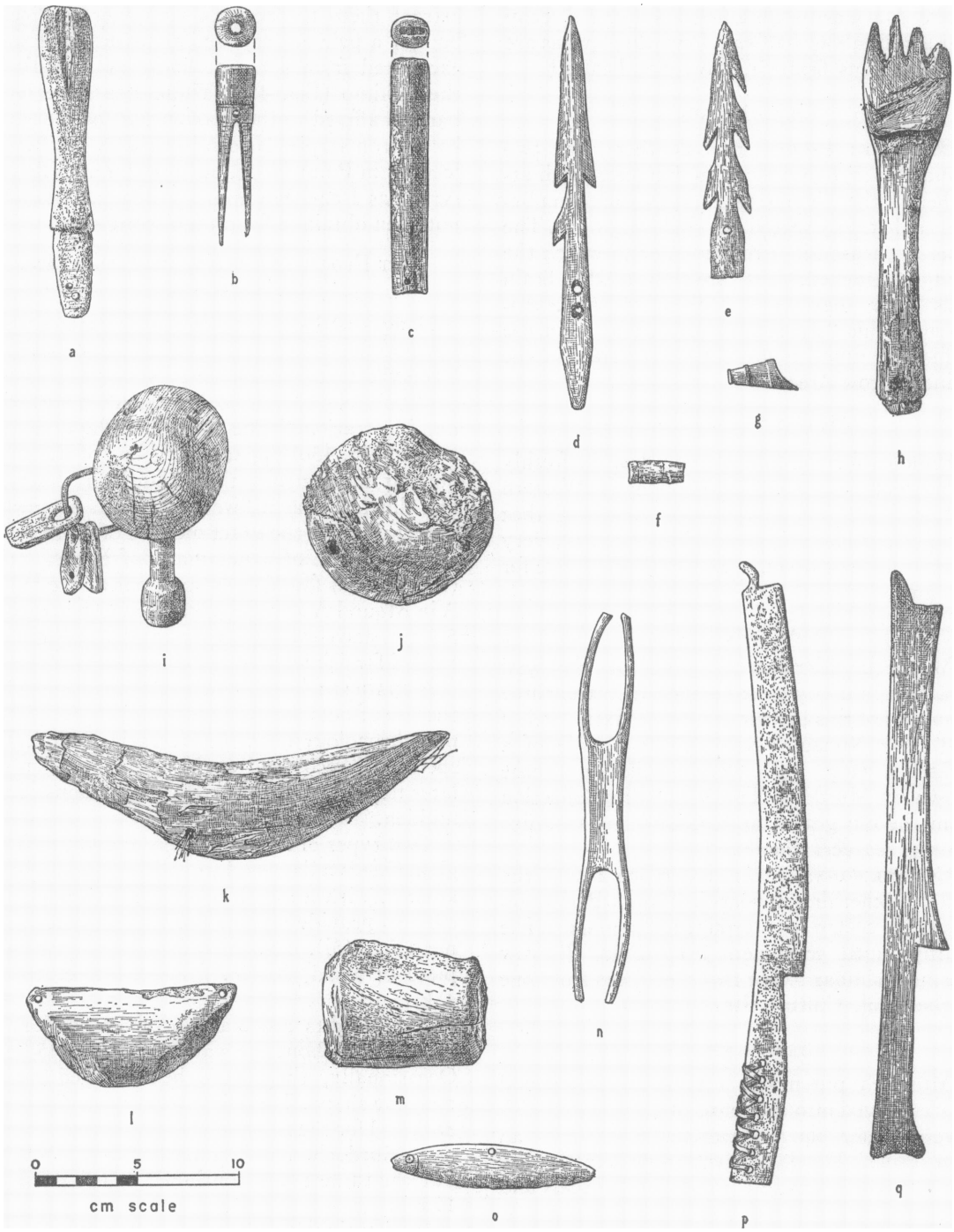


FIG. 45. Darting harpoon gear and seal netting equipment from the later deposits. a–c. Darting harpoon socket pieces. d–e. Darting harpoon heads. f–g. Inflation nozzles for dart bladders. h. Seal scratcher. i. Seal rattle. j–k. Net floats. l–m. Seal net weights. n. Netting shuttle. o. Fish effigy decoy. p–q. Seal net mesh gauges.

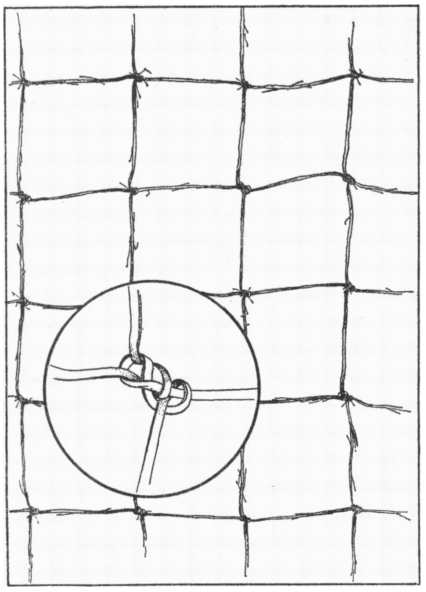


FIG. 46. Baleen fish net from Utkiavik.

ivory are found in the Punuk Culture sites on St. Lawrence Island, but other net appurtenances such as floats and gauges are not found there until recent times.[1]

Mathiassen found only one fragment of a baleen net at the Thule Site of Mitimatalik.[2] This is not a knotted net, and Mathiassen doubts that it could have been used for fishing. Mathiassen discusses at length the question as to whether nets and netting tools were acquired by the Eskimo from the Europeans despite their wide distribution in early historic times.[3] He is unable to cite any evidence of the occurrence of these items in a clearly pre-contact context. The evidence from the Point Barrow Area tends to substantiate the doubt that they were a part of native Eskimo culture, for they have been found associated with European trade goods in all the excavations. However, Giddings found both a shuttle and net gauges at the Intermediate Kotzebue Site on the Kobuk River for which he obtained tree-ring dates of about 1550 A.D.[4]

KNIVES FOR SQUEEZING OUT WATER

The ethnographic accounts of the Western Eskimo fail to describe a type of bone knife that is used to squeeze the water from the hides of caribou lanced while they were swimming. This serves to reduce the weight of the animal before it is loaded on the kayak. The tool is known from the Iglulik, Caribou, and Netsilik Eskimo,[5] and is also an element of the Thule Culture.[6]

UTKIAVIK: A knife of this type, recovered above House A, made of antler, is 24 cm. long and has a well-formed handle and a blade curved in section (Fig. 47). It is very similar to one in Rasmussen's Collection of archeological material from Point Barrow.[7] Mathiassen

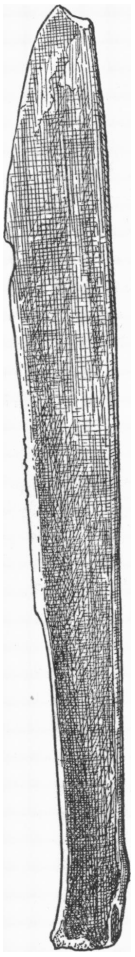


FIG. 47. Bone knife, supposedly for squeezing water from the skins of caribou lanced while they were swimming.

[1] Collins, 1937, 360, Pl. 75, Fig. 16.
[2] Mathiassen, 1927a, 189–190, Pl. 59.
[3] Mathiassen, 1927b, 58–59.
[4] Giddings, 1952, 36.
[5] Boas, 1907, Fig. 135.
[6] Mathiassen, 1927b, 51–52.
[7] Mathiassen, 1930, 42, Pl. 8, Fig. 8.

notes its resemblance to the bone daggers described by Murdoch.

A second knife, very similar to another specimen collected by Rasmussen,[1] comes from Cut 4. Made of a 36-cm.-long section of antler, its shape follows the curve of the antler in cross-section; the ends are blunt.

COMPARISONS: If these bone knives from Utkiavik are correctly identified, this trait suggests a relationship between the Utkiavik cultural phase and the Thule Culture. Apparently the item is late in Alaska and is confined almost entirely to the Point Barrow Area. It could have been brought from the East in the recent westward diffusion of Thule elements as suggested by Collins.[2]

ATLATL EQUIPMENT

UTKIAVIK: Murdoch describes and illustrates the type of atlatl used by the Point Barrow Eskimo in 1884.[3] This has a plain handle, without pegs for the fingers, and a shallow groove for the dart. A hole through the board for the insertion of the forefinger is placed at one side of the groove. At the distal end, a small peg of ivory or other material is provided to engage the concave butt of the dart. Unfortunately, my collections do not include atlatls from the recent sites.

NUNAGIAK: An atlatl with both the distal end and the hook broken off, but otherwise almost identical with the historic form, comes from Entrance D, Mound C (Fig. 48b). The groove for the shaft extends the entire length to the butt of the handle. A hole at one side of the groove is for the insertion of the forefinger. The handle has three depressions to receive the tips of three fingers. In the latter respect this atlatl is more similar to the Birnirk type, described below, than to the historic type.

The broken tip of another atlatl, complete with ivory spur, was found in Mound C. The tip was curved away from the grooved face of the instrument, and this feature, as well as the shape of the spur, is similar to that of the Birnirk type of atlatl. An almost identical atlatl, complete except for a piece broken off the handle, comes from Section 3, Cut 3, at Nuvuwaruk. A third complete atlatl (Fig. 48a), except for the missing hook, was a gift of Mr. George A. Morlander, the school teacher at Wainwright.

BIRNIRK: Five atlatls of the distinctive Birnirk type were recovered from Birnirk. These are virtually all of the same shape and size, about 30 cm. long (Figs. 49 and 50a). On the back of each a deep hole for the index finger extends almost through to the groove on the opposite face; in one example, the hole does extend through. Along the side of the handle are three deep sockets for the last three fingers. All these spear-throwers are made for right-handed individuals whose hands were rather smaller than the hand of a normal European male. On the back of these atlatls, just above the index finger hole, are two carved, very gracefully arched reënforcements (Fig. 50a). The distal ends of the atlatls project several centimeters beyond the ivory hook and curve away from the face of the instruments that carries the groove for the dart. The ivory hooks set into the Birnirk type of atlatl are illustrated in Fig. 51d.

COMPARISONS: Atlatls of the Birnirk type are included in Van Valin's Collection from the old graves at Kugusugaruk.[4] Surprisingly, an atlatl conforming perfectly to the Birnirk style was found in the upper levels of the beach slope cut at the Kukulik Site on St. Lawrence Lsland, associated with harpoon heads of Birnirk and Punuk types.[5] Four throwing boards were found in the Old Bering Sea Period deposits at the Miyowagh Site on St. Lawrence Island. In details of grip and grooves for the dart these are very similar to the Birnirk specimens, as Collins noted.[6] One of the detached ivory hooks from the Hillside Site (Early Old Bering Sea) resembles those found at Birnirk; another similar hook comes from Miyowagh.[7] One of the atlatls from the Old Bering Sea Culture deposits of Miyowagh has the identical grip of the Birnirk Type. Just forward of the hole for the forefinger are two slight swellings in the profile of the instrument at the same points where the ends of the "arches" on the Birnirk Type would be attached. Possibly these are vestigial features derived from the same design tradition.[8]

Throwing boards at Mathiassen's Thule Culture sites in the Central Arctic were not com-

[1] Mathiassen, 1930, Pl. 8, Fig. 9.
[2] Collins, 1937, 367.
[3] Murdoch, 1892, 217–218, Fig. 205.
[4] Mason, 1930, Pl. 1.
[5] Geist and Rainey, 1936, 212, Pl. 73, Fig. 7.
[6] Collins, 1937, 133, Pl. 37, Fig. 1.
[7] Collins, 1937, Pl. 29, Fig. 8; Pl. 33, Fig. 23.
[8] Collins, 1937, Pl. 37, Fig. 1.

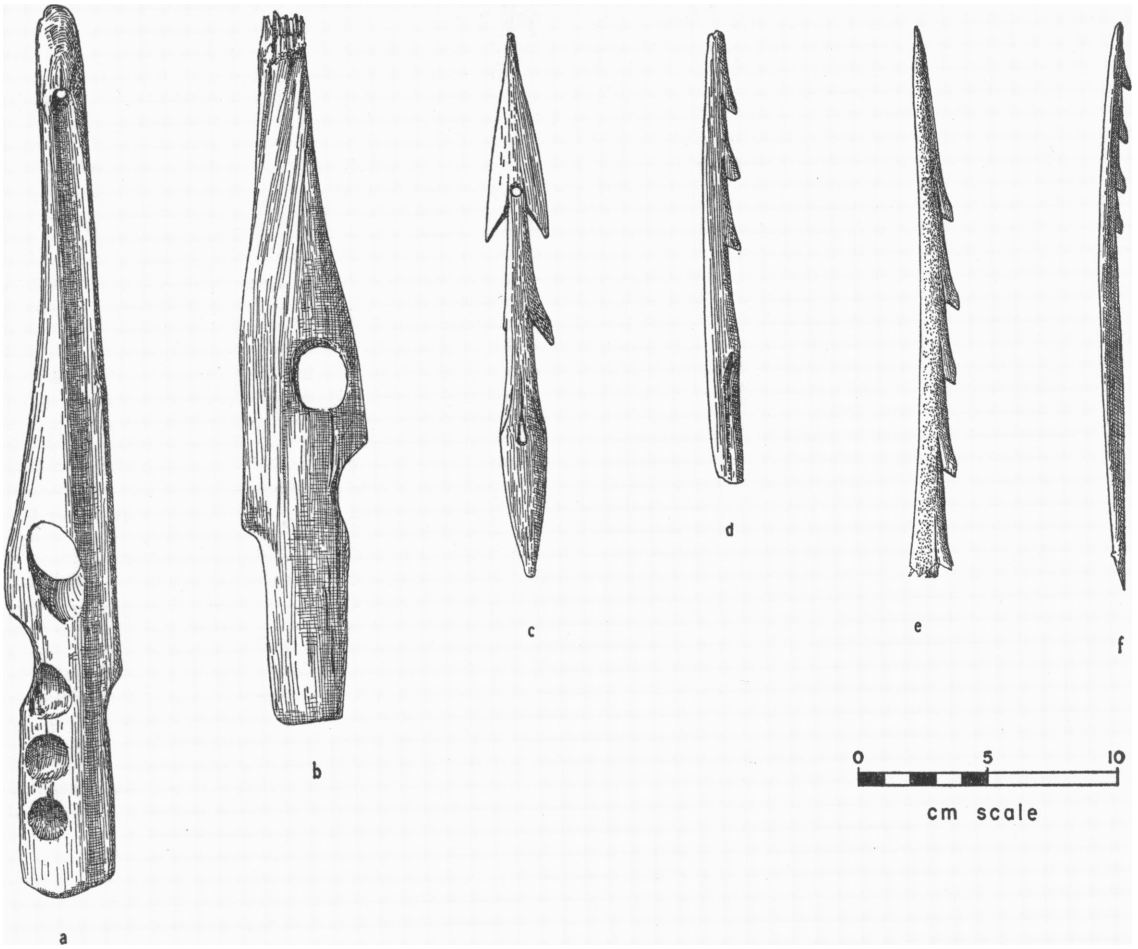


FIG. 48. Atlatl gear from Nunagiak. a–b. Throwing boards or atlatls. c. Point for bladder dart harpoon. d–f. Bird dart points.

mon. One fragment of the handle portion has a longitudinal groove for the dart and sockets for the tips of the fingers. Other details are not clear.[1]

From excavations in northwest Greenland, Holtved found six throwing boards that in most features resemble the specimens described above from Nunagiak. The principal difference is that a continuous groove is provided for the finger tips rather than individual holes.[2]

DART SHAFTS AND BUTT PIECES

UTKIAVIK-NUWUK: Strangely enough, neither dart shaft fragments nor butt pieces are included in the collections from the recent sites. The bird and seal darts collected by Murdoch did not have bone or ivory butt pieces; apparently this trait disappeared in recent times.[3]

NUNAGIAK: Twelve dart shaft fragments were found at Nunagiak. In diameter and other characteristics these fall within the range of the fragments from Birnirk. One fragment from Mound C, Entrance D, was painted red. The single butt piece from Nunagiak was of Type A, as described below.

BIRNIRK: Eighteen fragments of the wooden shafts of darts to be cast with a throwing board were found. These are round, with diameters ranging from 1 to 1.5 cm., and are very nicely finished (Fig. 50d). On one fragment, 1.4 meters

[1] Mathiassen, 1927a, 152, Pl. 41, Fig. 11.
[2] Holtved, 1944, 209–210, Fig. 84.
[3] Murdoch, 1892, 214–218.

long, from the floor of House A, Mound A, three small longitudinal slits are equally spaced around the shaft to receive the butts of bird dart side prongs. In another fragment from Mound G the end of the dart is tapered for insertion into a bone or ivory butt piece.

Butt pieces for darts totaled five: two are of ivory, three of antler. They are of two types. Type A has the dimple for the throwing board spur in one end and in the opposite end a somewhat deeper socket to receive the tapered end of the dart (Fig. 51a). The dart fragment from Mound G, mentioned above, is prepared for a Type A butt piece. Type B has a shallow dimple to receive the atlatl hook in one end; the other end is formed into a tang that was inserted into the dart (Fig. 51b–c).

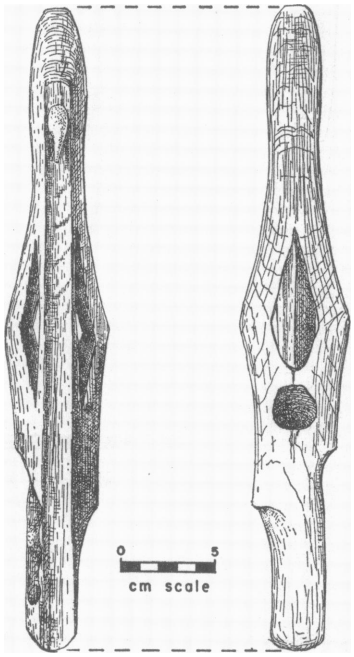


FIG. 49. An atlatl from the Birnirk Site.

COMPARISONS: Butt pieces of Type B are rare on St. Lawrence Island. One was found in Old Bering Sea Period deposits at Miyowagh,[1] and another came from Punuk Period deposits in Ievoghiyoq.[2] Mathiassen reported Type B butt pieces from the Thule Culture sites of Naujan[3] and another, even more like the Western type, from Mitimatalik.[4]

There seems to be little variation in the size of the dart shafts. The small butt pieces of the two types described above that are fastened to the end of the dart to receive the hook of the throwing board seem to have a rather limited distribution in both time and space. They were possibly more commonly used in the Point Barrow Area in Birnirk times than during the Old Bering Sea and Punuk periods of St. Lawrence Island, or in the Thule Culture of the Central Eskimo Region. These objects suggest the possibility that the heavier and much more complex "winged objects" of the Bering Strait Region may have been intended as butt pieces for the seal or walrus harpoon.[5] Among other suggestions, Collins includes the possibility of a historical connection between these ancient Bering Strait forms and the modern "winged" or "feathered" harpoons cast by the Angmagssalik Eskimo of East Greenland by means of a throwing board.[6] Unfortunately, the small butt pieces just described are too simple to form a typological link between the forms of Bering Strait and those of Greenland. In addition, these butt pieces are designed for the light seal and bird darts and not for the heavier harpoon.

Winged objects of the Western form apparently were known in the Point Barrow Area, but evidently were far from common. A bark miniature, certainly a toy, was found at Birnirk (p. 218). At Nunagiak, a Punuk Period object was found in the house that contained several objects of Punuk style (Fig. 21o). This scarcity parallels the apparently complete absence of the heavier "winged objects" in sites of the Thule Culture in Arctic Canada.

BLADDER DARTS, INFLATION NOZZLES, SOCKET PIECES, AND DART POINTS

By 1884, when Ray's party wintered at Barrow, the bladder dart was no longer used. At that time the only seal dart thrown with the atlatl was small, and the dart shaft served as drag. Murdoch, however, was well aware that in the past these darts had a bladder float, for the nozzle used for such a float was found in a ruined house in Utkiavik.[7] He also cites evi-

[1] Collins, 1937, 134, Pl. 33, Fig. 25.
[2] Collins, 1937, 220, Pl. 73, Fig. 18.
[3] Mathiassen, 1927a, Pl. 33, Fig. 17.
[4] Mathiassen, 1927a, 189, Pl. 58, Fig. 11.
[5] Collins, 1937, 201.
[6] Thalbitzer, 1914, 414, Fig. 113.
[7] Murdoch, 1892, 214–215.

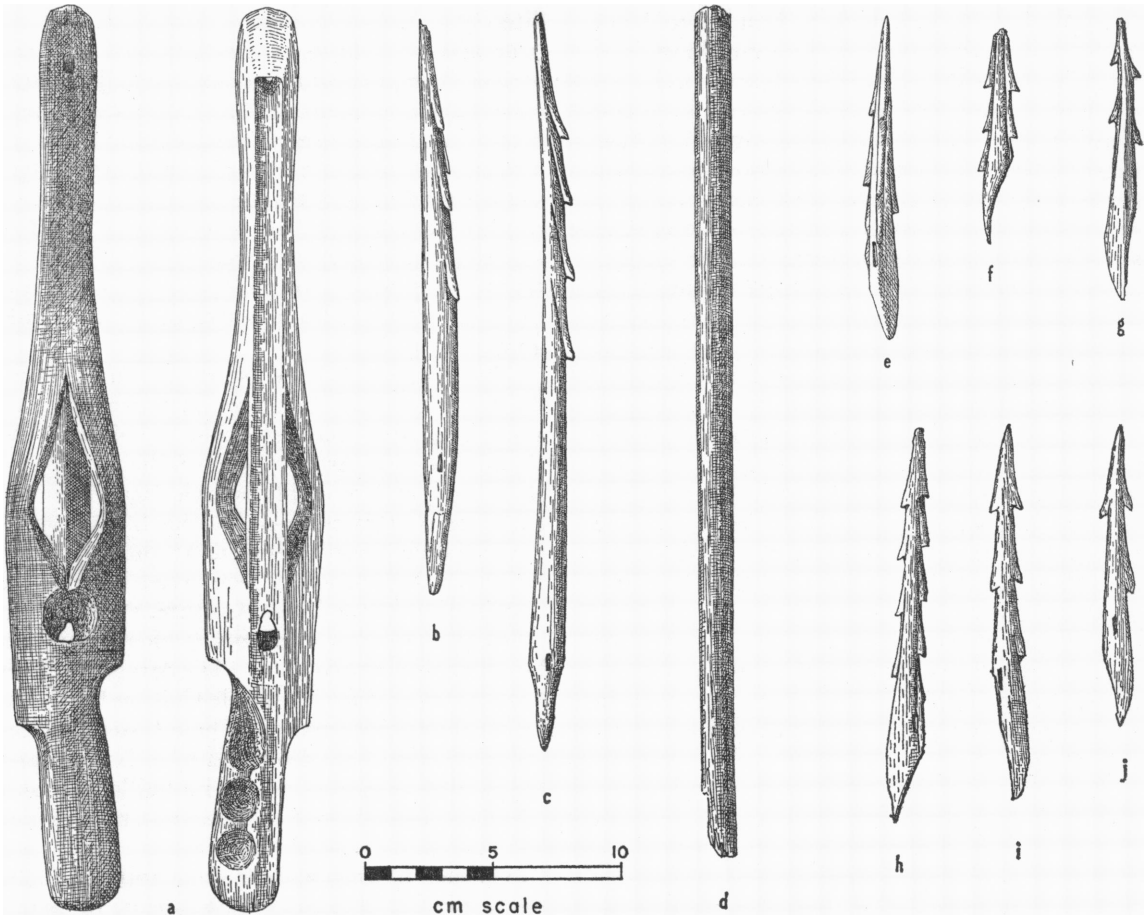


FIG. 50. Atlatl gear from Birnirk. a. Two views of an atlatl. b–c. Bird dart points made of antler. d. Fragment of a dart shaft. e–j. Bird dart side prongs made of antler.

dence that a larger dart, similar to the bladder dart of the Greenland Eskimo, was formerly used at Barrow. The single seal dart illustrated by Murdoch has an ivory socket piece 5 inches long, with a wedge-shaped butt fitted into the shaft.[1] The socket for the detachable head is wedge-shaped. Murdoch does not describe these darts.

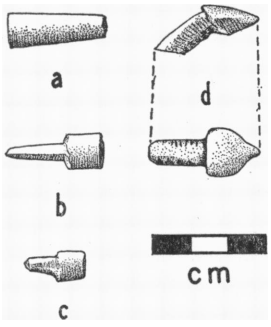


FIG. 51. Atlatl parts from Birnirk. a. Dart butt piece with socket for shaft. b-c. Dart butt pieces with tangs. d. Two views of ivory hook used in distal end of atlatl.

UTKIAVIK-NUWUK: The present collections from abandoned portions of Utkiavik and Nuwuk include two bladder inflation nozzles from each site. Three of these are flattened on one side and provided with grooves for lashing to the dart shaft (Fig. 45g); the remaining nozzle is round and has no provision for attachment to the shaft (Fig. 45f).

Socket pieces for these darts were somewhat more numerous; five came from Utkiavik, and nine were in the purchased collections from Nuwuk. Type A socket pieces are made of bone

[1] Murdoch, 1892, 216, Fig. 203.

or antler (Fig. 45a). They are round, 2 to 3 cm. in diameter, and from 13 to 22 cm. long. The tang is wedge-shaped and was attached to a shaft which had a V-shaped scarf. In all but one example the wedge-shaped tangs of these socket pieces are separated from the body of the socket piece by a shoulder against which the shaft rests. Generally, two small spurs on opposite sides of the tang project into the lashing and further secure the socket piece to the shaft.

Type B socket pieces are scarfed to the shaft in the opposite fashion from that of Type A; the V-shaped base receives a wedge formed on the dart shaft (Fig. 45b).

Type C, represented by one example in the purchased collection from Nuwuk, has a slot for the harpoon head at one end. At the opposite end it has a deep conical socket to receive the shaft of the dart. Small drilled holes indicate that the shaft was held in this socket by means of rivets (Fig. 45c).

Strangely enough, the detachable heads for the seal dart are exceedingly rare in these collections. From Utkiavik there is only one, a barbed head with two line holes and a conical butt (Fig. 45d).

NUNAGIAK: Two bladder dart points came from Nunagiak. One dart (Fig. 45e) has a wedge-shaped base; the other, excavated from Structure E, Mound C, has a conical base (Fig. 48c).

COMPARISONS: On St. Lawrence Island the unmistakable mouthpiece for the bladder float appears in the Punuk Period.[1] Most of the specimens are flattened on one side, so that they can lie against the shaft, but usually the St. Lawrence mouthpieces are provided with a lashing slot, a feature not present at Point Barrow. Specialized socket pieces and detachable heads for these darts are lacking in the St. Lawrence Island Punuk Period; they do appear, however, in the recent prehistoric period.[2] These items are well distributed on the northern Bering Sea Coast in historic times.[3]

From sites along the Kobuk River, Giddings describes long conical butt dart heads from the Ahteut Site (1250 A.D.) which were in use through the time of the Intermediate Kotzebue Site (1400 A.D.).[4] Judging from the illustration, it appears that at least the specimen from the earlier site can be equated with the objects here called bird dart points.[5] The unmistakable complex of a dart socket piece, bladder inflation nozzle, and the short barbed head with wedge-shaped tang does not appear prior to the tree-ring date of 1400 A.D.[6] at the Ekseavik Site. The socket pieces have both wedge-shaped and bifurcated tangs. At Point Hope a dart point was found in a house ruin associated with Thule Type 2 harpoon heads.[7]

This evidence from Western Eskimo sites indicates that the bladder dart was known slightly earlier than my collections from the Point Barrow Area would indicate. There should be, and probably is, evidence of the occurrence of this weapon in the little-investigated Thule Period deposits at the Nunagiak Site. This conclusion is reënforced by its wide distribution in the Thule Culture.

Mathiassen lists dart socket pieces with tubular and bifurcated bases.[8] The detachable dart heads described for the Thule Culture have conical tangs and a single line hole.[9] Mouthpieces for the bladder are also listed from Naujan and Qilalukan, but, as can be seen in the illustrations, these are not flattened to fit against the shaft as they are in the west.[10]

The use of the bladder dart appears to be earliest in the west and to have spread eastward with the Thule Culture. In any event, it does not seem to be an ancient Eskimo trait. Possibly during Old Bering Sea, Early Punuk, and Birnirk times a heavier harpoon with a toggle head was cast from the kayak by means of the throwing board. As is suggested elsewhere (p. 114), the problematical "winged" objects from the Bering Strait Region may be butt pieces for such harpoons, and, of course, the "winged" or feathered harpoons of the Greenland Angmagssalik may be evidence for a peripheral retention of the old Western trait.

BIRD DART POINTS AND SIDE PRONGS

Bird darts to be cast with the throwing board were in common use at Point Barrow

[1] Collins, 1937, 220–221, Pl. 73, Figs. 10–12; Geist and Rainey, 1936, Pl. 54, Figs. 26–27.

[2] Geist and Rainey, 1936, Pl. 42, Fig. 5; Pl. 20, Fig. 9.

[3] Nelson, 1899, 135–137, Pl. 54, Pl. 56, Figs. 17–29, Pl. 57, Figs. 16–20.

[4] Giddings, 1952, 57.

[5] Giddings, 1952, Pl. 16, Fig. 4.

[6] Giddings, 1952, 54.

[7] Larsen and Rainey, 1948, Pl. 95, Fig. 4.

[8] Mathiassen, 1927b, 33–34.

[9] Mathiassen, 1927b, 31.

[10] Mathiassen, 1927a, Pl. 5, Fig. 10; Fig. 48.

when Ray's party wintered there. These usually had a single bone point, less often two points. Near the middle of the shaft three side prongs were fastened so that they projected at an angle.[1]

UTKIAVIK: Despite Murdoch's statement as to the prevalence of bird darts, relatively few points and side prongs occur in the extensive collections from the abandoned houses of Utkiavik (Fig. 52). The broken base of a bird dart point of antler came from the floor deposit of

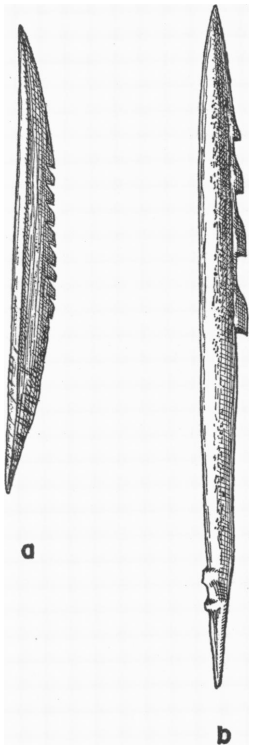


FIG. 52. Bird dart side prongs from Utkiavik.

House A. This is round and has a tapering tang with a shoulder separating it from the body of the dart. A similarity to the tangs of arrowpoints from the late sites is readily seen. A small drilled hole near the butt is provided for a lashing to secure the dart to the shaft should it become loose in its socket.

The bases of the side prongs, sharpened like knife blades, are made at an angle so that when they are inserted into grooves in the dart shaft the side prongs extend outward. On the opposite sides of the bases are small knobs to hold the lashing in place.

[1] Murdoch, 1892, 210–214.

NUNAGIAK: No bird dart points were found. A fragmentary side prong from Level 6, Cut 2, conforms to the type described from Utkiavik. Another from Mound C, Entrance D, of antler, 18 cm. long, is serrated on only one side. A lashing slot is provided.

BIRNIRK: The reputation of the Birnirk Site as a bird-hunting station was upheld by the 20 bird dart side prongs in the collection. Only two bird dart points, both made of antler, were found (Fig. 50b–c). The complete specimen is 28 cm. long. Both are round in section and are serrated on only one side. The tang of one dart tapers to a point; the other has a sloping shoulder. There is a distinct similarity to the tangs on the arrows from the Birnirk Site. Small slots above the tangs hold a lashing to prevent loss of the head. Baleen fragments remain in one slot.

The side prongs from Birnirk, usually made of antler (only four are of ivory), are shorter than the later side prongs. They range from 10 to 17 cm. in length. Two classes are observable. Class A side prongs are flattened oval or lens-shaped in cross-section and have barbs on both edges of the blade (Fig. 50g–j). These barbs are gracefully curved in outline in contrast to the angular serrations of the side prongs from Utkiavik. The barbs on each range from three to eight. They are placed alternately; those on one side are midway between those on the opposite side. The bases of these side prongs have a knife-like edge set at an angle for insertion into the wooden dart shaft. Usually a small lashing slot is provided; a few have a small notch to secure the lashing.

The bases of Class B side prongs are similar to those of Class A (Fig. 50e–f). The principal differentiating feature is that side prongs are triangular in cross-section and that there are barbs on each of the three edges.

COMPARISONS: The long barbed bird dart points, rare in the Okvik and Old Bering Sea stages of St. Lawrence Island, are comparable in general features with the points from Birnirk.[2]

Bird dart side prongs are even more definitive. Class A contains examples which Collins has described as Types 1, 1a, 2, and 2a from the Old Bering Sea Period midden in Miyowagh.[3]

[2] Rainey, 1941, Fig. 13, Items 5, 15; Collins, 1937, 132, Pl. 33, Fig. 11; Geist and Rainey, 1936, Pl. 77, Fig. 1.
[3] Collins, 1937, 131.

However, while most of the Class A specimens resemble those from St. Lawrence Island, they do not fit into Collins' classification, because the number and arrangement of the barbs differ. One fragment from the floor of House A, Mound A, has two decorative notched elevations opposite the lashing slot as in Collins' Type 2.[1] This same general class of side prong, with alternating barbs on both sides and with a lashing slot, is the usual type at the still earlier Okvik Site.[2]

The triangular side prong, Birnirk Class B, is not so well represented in the Bering Strait Area. A single specimen was found at the Miyowagh Site on St. Lawrence Island.[3]

Specimens from Ipiutak houses that may be bird dart points have tapering butts and curving barbs alternately placed. One has barbs on only one side. Except for the absence of the small hole near the butt, they are, as the authors say, essentially similar to Okvik points.[4]

The side prongs from Ipiutak houses are also similar to those known from the two early St. Lawrence stages, particularly in that some are decorated like those from Okvik.[5] Except for the latter feature they correspond precisely to Birnirk, Class A. From the illustration, one fragmentary side prong from House 57, Ipiutak, appears to be triangular in section and thus conforms at least partially to Birnirk, Class B.[6]

The recent Alaskan side prongs with lashing around the prong base and no slot are similar to bird dart side prongs from the Thule Culture sites of the Central Arctic.[7] In contrast to most modern prongs they have alternately placed barbs on both sides; usually only one barb on the outside with two inside. The barbs do not have the curved outlines of the Birnirk specimens; one from Naujan, however, has the angular outlines of the recent specimens from the Point Barrow Area.

Apparently the Birnirk bird dart accessories, derived from the Old Bering Sea Period types of the Bering Strait Region, gave rise in turn to the Thule types. Side prongs from the Thule sites already have some of the features that characterize the recent specimens from both the Central Arctic Region and from Alaska. A parallel development may have occurred during the Thule Period in the Point Barrow Area, but the lack of a sufficient number of specimens from the Nunagiak Site makes a conclusion impossible at this time.

[1] Collins, 1937, 131, Pl. 33, Fig. 6.
[2] Rainey, 1941, Fig. 13, Items 1–3, 7–10.
[3] Collins, 1937, Pl. 33, Fig. 8.
[4] Larsen and Rainey, 1948, 78, Pl. 7, Figs. 11–16.
[5] Larsen and Rainey, 1948, 77–78, Pl. 7, Figs. 1–3.
[6] Larsen and Rainey, 1948, Pl. 7, Fig. 7.
[7] Mathiassen, 1927b, 53–54.

BOWS AND ARROWS

When Ray's party was at Barrow, bows and arrows were still used by a few Eskimo who were too poor to buy guns, and excellent bows were made as toys for children. Murdoch describes in some detail the three bows he collected.[8] A boy's bow made of one straight piece of spruce was obtained from Utkiavik. At Sidaru he collected men's three-piece, reflex-shaped bows, with the two short end pieces scarfed to the mid-portion at the bends and the joints reënforced by antler braces.

Murdoch describes the method of applying the multi-strand sinew backing which was separated into two cables and twisted to provide the necessary elasticity lacking in the spruce used for the wooden portions of the bows.[9] He also describes and explains the uses of a set of bow tools consisting of a feather setter, a marlinspike, and two twisters, all perforated and strung on a sinew cord.[10]

UTKIAVIK-NUWUK: Four fragments of the nock ends of bows were excavated at Utkiavik, and one is included in the collection purchased from Nuwuk (Fig. 53a). These conform exactly to Murdoch's description: they are oval in outline, slightly flattened on the back. The nocks are straight, peg-like projections, and the shoulders are sometimes beveled on the back for the sinew cable. Two of the five fragments are long enough to demonstrate that they are parts of three-piece bows; they are wider and thinner towards the scarf which was V-shaped for the end pieces and wedge-shaped for the central part of the bow. Marks of the bracer are plain on one specimen. A fragment from the floor of House A, Utkiavik, 29 cm. long, shows no evidence of recurve; presumably it is a portion of a straight bow.

Two fragments of toy wooden bows were excavated in House A, Utkiavik. One of these il-

[8] Murdoch, 1892, 195 ff.
[9] Murdoch, 1892, 196–198.
[10] Murdoch, 1892, 291–294.

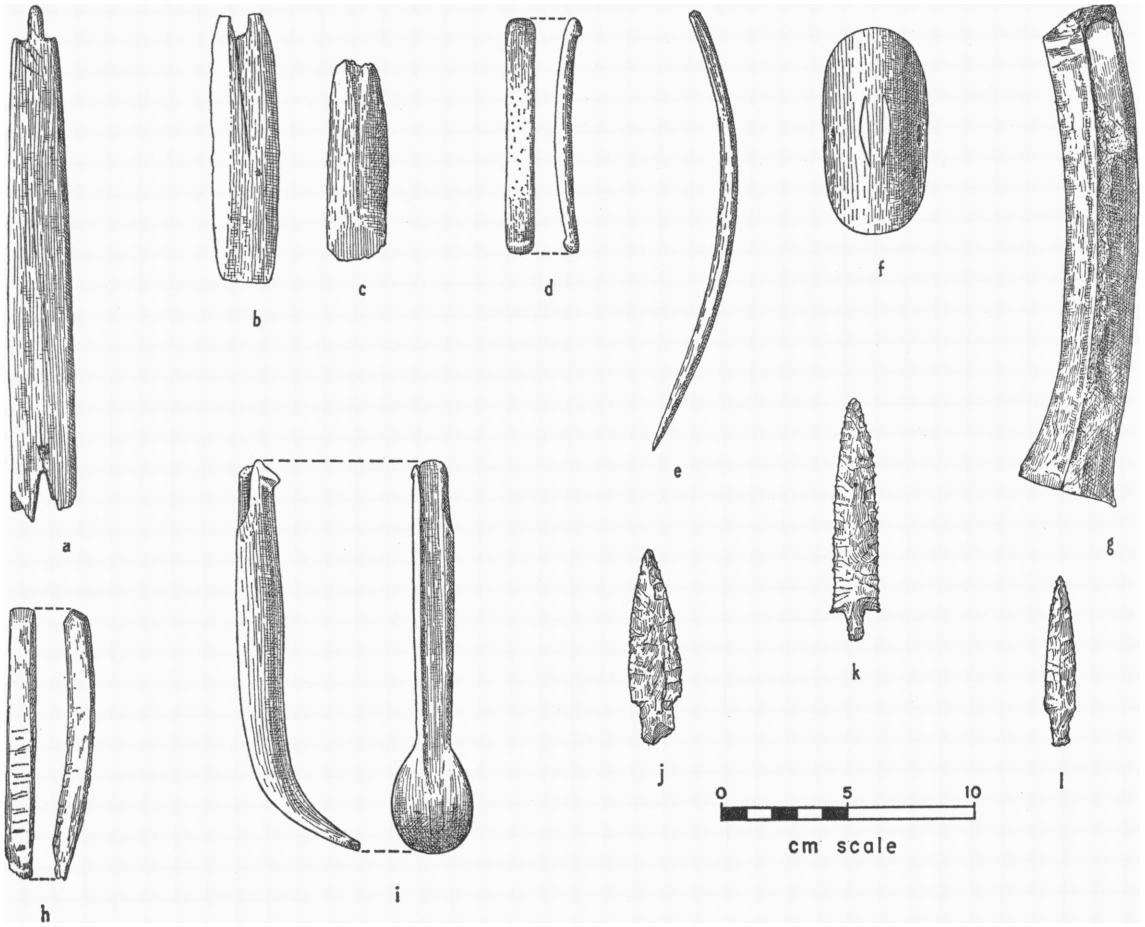


FIG. 53. Bow gear from Nuwuk and Utkiavik. a. Nock end of three-part reflex bow. b–c. Antler braces for splices in compound bows. d. Two views of sinew wrench used to tighten cable on back of bow. e. Marlinspike used to tighten bow lashings. f. Wrist guard. g. Section of antler grooved with composite knife, the first step in making arrowpoints. h. Bone point for flint flaker. i. Two views of flint flaker handle. j–l. Flint arrowheads.

lustrates the recurve of the reflex shape and the narrowing and thickening of the bow stave at the hand grip in the center. Three bow splice reënforcements made of antler were excavated at Utkiavik, and five from Nuwuk were purchased (Fig. 53b–c). These flattened rectangular pieces, curved laterally to conform to the curve between the center and end sections of the bows, have a slight transverse concavity to fit against the wooden staves, and on the back generally have another concavity for the sinew cable. The surfaces are roughened to assist in holding the lashing.

One bone marlinspike from Utkiavik, House A, 18 cm. long, has a head very similar to one illustrated by Murdoch, but it lacks the perforation (Fig. 53e).[1] Two others are unfinished.

Two sinew twisters from House A are also of bone; one from House B is of ivory. Four of these tools made of antler and two of ivory are in the purchased collections from Nuwuk (Fig. 53d). These specimens are 10 to 12 cm. long, oval in section. Several have slots for their being strung together. In all these features the sinew twisters resemble those from Birnirk more than they do the larger tool illustrated by Murdoch.[2]

NUNAGIAK: Fragments of bows were comparatively abundant in the limited excavations

[1] Murdoch, 1892, Fig. 285.
[2] Murdoch, 1892, Fig. 286.

at Nunagiak. Five portions of bow end-pieces have features of the reflex shape. Two of these end-pieces have the V-shaped scarf described for the Utkiavik specimens. In shape of nock and cross-section the bows from Nunagiak seem to be identical not only to those from Utkiavik but to the historic type described by Murdoch. No bow bracers were found.

One pair of marlinspikes, a single spike, and two fragmentary sinew twisters are identical to the specimens described from Utkiavik. All are made of antler (Fig. 54d).

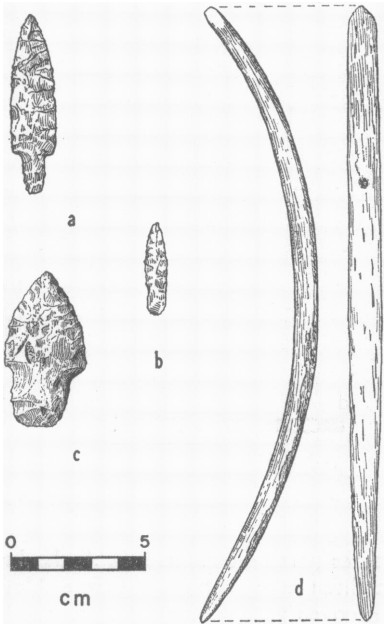


FIG. 54. Bow gear from Nunagiak. a–c. Flint arrowheads. d. Marlinspike used in tightening bow lashings.

The seven toy bow fragments from Nunagiak also yield some information about shapes. A wooden toy from Cut 2, Section 3, is 1 cm. wide and 20 cm. long. It has the bend of the reflex bow but is made in one piece. Another, 31 cm. long, from Mound C evidently is a straight bow. On all these fragments the nocks have the squared shoulders similar to the specimens from Utkiavik.

BIRNIRK: Although fragments of bows are also rather common at the Birnirk Site, they unfortunately have only a few diagnostic features. One fragment from House H, Mound A, has a nock at one end, is 60 cm. long, and is only slightly curved (Fig. 55a). It is apparently part of a straight one-piece bow. It is oval in cross-section, flattened on the back, and is 3.6 cm. wide and 1.2 cm. thick. Two other fragments are obviously parts of reflex bows. One from the floor of House C, Mound A, bears the marks of the bracer but no details of the scarf joint (Fig. 55d). The other short fragment from Section 4, Cut 13, Mound J, has the wedge-shaped portion of the scarf joint.

Toy bows are even more common than the full-sized weapons. Nineteen complete and fragmentary bows were found, four of baleen, the remainder of wood. Complete baleen toys, measuring between 26 and 50 cm. in length, came from the floor of House D, Mound A (Fig. 55b); the floor of House A, Mound C; and the roof of House A. They have the recurved ends of the reflex bow. A complete wooden bow, 28 cm. long, from the floor of House A, Mound A, has a similar shape, as do two almost complete bows from the floor of House C, Mound A. A toy from Cut 3, Section 7, Mound A, is the larger section of a baleen reflex bow, with a wooden stave lashed to its central section.

The most complete bows dating from the Birnirk Period are those found by Van Valin accompanying the burials at the Kugusugaruk Site. These are illustrated in Fig. 4 and are described in the foregoing pages.

Bow bracers from Birnirk (Fig. 55m) are somewhat more crudely made than those from Utkiavik. They are of antler curved to fit the bend of the bow, taper in thickness towards both ends, and are slightly concave where they fitted against the bow stave. However, none has the concavity on the back face to accommodate the sinew cable as do the later bracers.

Two complete sets of bow tools were found tied together by a strand of baleen run through slots in one end. Both sets were from Mound A: one was from Cut 3, Section 7 (Fig. 55e–g), the other was on the floor of the entrance to House A. Each set consists of two marlinspikes and one wrench. Two other marlinspikes were found at other points in Mound A. All these tools are made of bone. The wrenches are identical to those from the later sites, but while the marlinspikes are similar in shape, they tend to be shorter than the spikes from Utkiavik. The spikes from Birnirk range from 13 to 17 cm. in length; those from Utkiavik range from 18 to 24 cm.

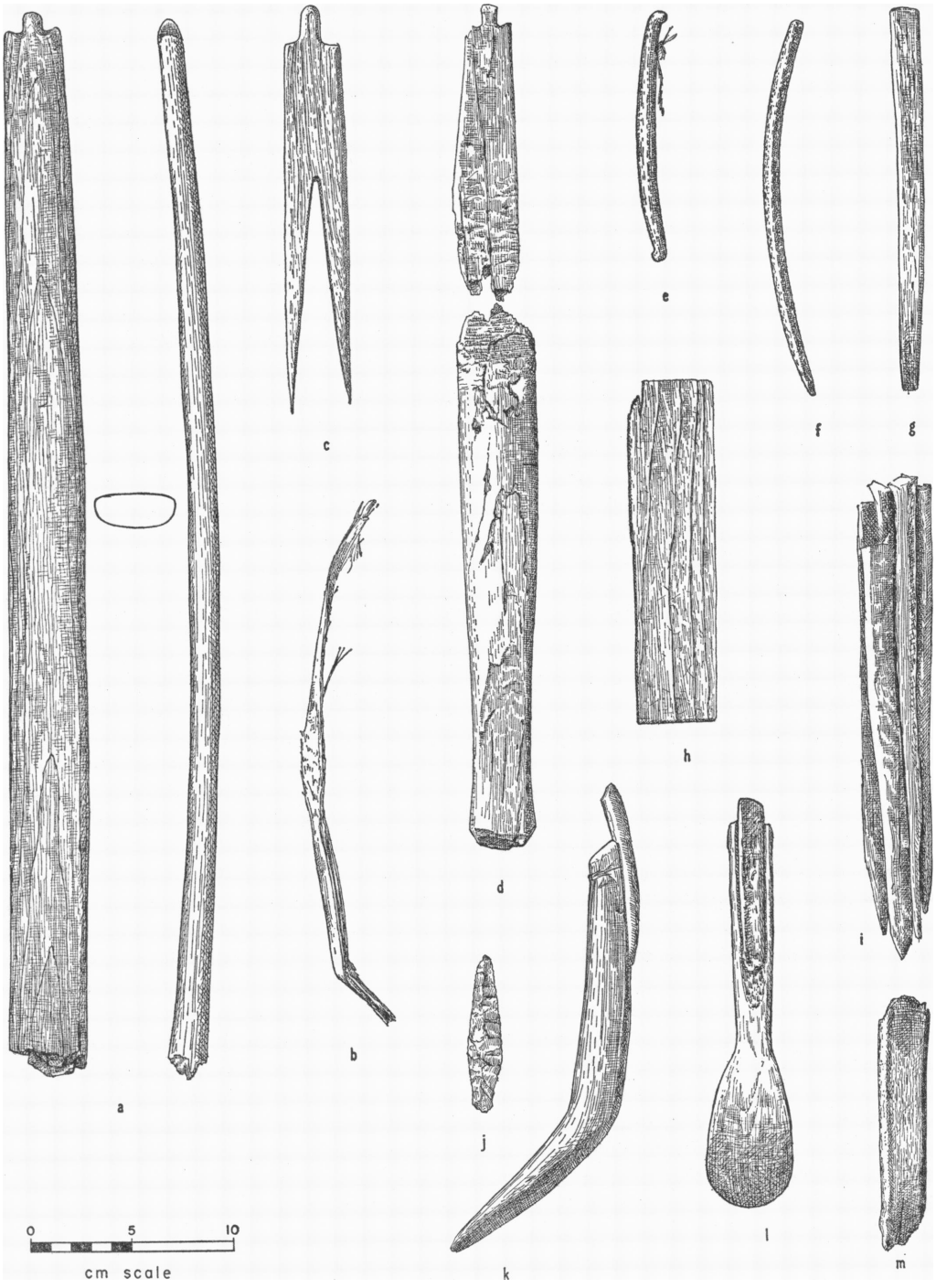


FIG. 55. Bow gear of Birnirk Period. a. Two views of portion of stave of simple bow. b. Toy baleen bow showing reflex curve. c–d. Parts of three-piece reflex bows. e–g. Set of bow tools: a sinew wrench and two marlinspikes. h. Board for cutting feathers for fletching arrows. i. Bundle of rods cut from antler for making arrowpoints (cf. Fig. 53g). j. Flint arrowhead. k–l. Two flint flakers with antler handles and bone points. m. Antler plate for reënforcing the splice in three-part bow.

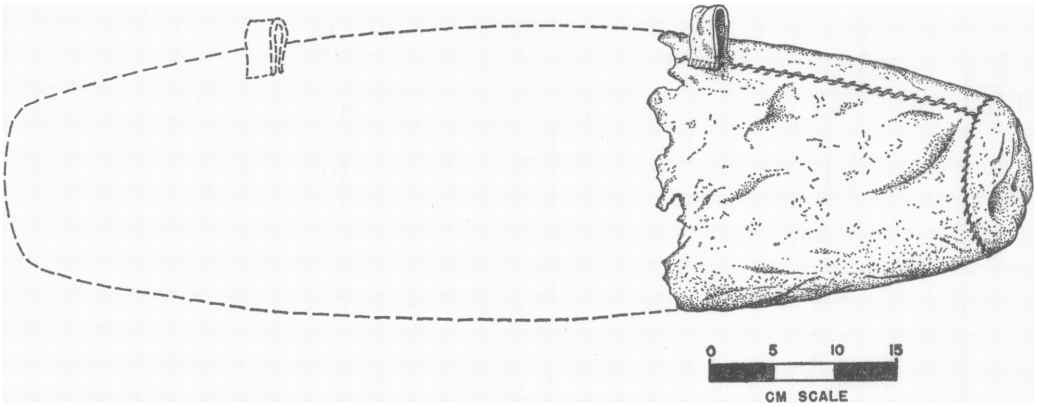


FIG. 56. Portion of a bow case, made of de-haired sealskin, from Birnirk.

What appears to be a portion of a bowcase made of de-haired sealskin was recovered from Mound H (Fig. 56). A circular piece has been sewed in to form the end of the bag. About 14 cm. from the end a suspension strap is sewed into the seam that runs along the top of the bag. There is no evidence of the attachment of a stiffening rod like that used on the bowcase in historic times.

COMPARISONS: Bows on St. Lawrence Island were in use from the earliest Okvik times, but the first evidence for the use of the composite, sinew-backed bow is found in the Punuk Period.[1] This evidence consists of bracers and sinew wrenches essentially similar to those from Birnirk. Giddings reports bow braces, marlinspikes, and sinew wrenches from Ekseavik which have a tree-ring date of 1400 A.D.[2]

The sinew-backed compound bow is also known from the Thule Culture of the Central Arctic. Bow bracers were not found by Mathiassen but are described for the Thule Culture by Collins and Holtved.[3] Sinew twisters and marlinspikes are similar to those found in Alaska. One difference lies in the holes for the cords used to string the tools. Usually these are round, rather than the oblong slot found in the Point Barrow Area.[4] One wrench illustrated from Naujan does have a slot.[5] Manning illustrates a splice bracer from a Thule Culture site on Banks Island.[6]

[1] Collins, 1937, 323.
[2] Giddings, 1952, 47.
[3] Collins, 1950, Pl. 6, Figs. 17–18; Holtved, 1944, Pl. 10, Figs. 21–23.
[4] Mathiassen, 1927b, 44.
[5] Mathiassen, 1927a, Pl. 8, Figs. 8–9.
[6] Manning, 1956, Fig. 19e.

ARROWSHAFTS

Murdoch collected 51 arrows from the Point Barrow Eskimo between 1881 and 1883. He describes their shafts and feathering as follows:

> The stele is almost always a straight cylindrical rod, almost invariably 0.4 inch in diameter, and ranging in length from 20 to 28 inches. Twenty-five inches is the commonest length, and the short steles, when not intended for a boy's bow, are generally fitted with an unusually long pile. From the beginning of the feathering the stele is gradually flattened above and below to the nock, which is a simple notch almost always 0.2 inch wide and of the same depth. The stele is sometimes slightly widened just in front of the nock to give a better hold for the fingers. The feathering is 6 or 7 inches long, consisting of two, or less often, three feathers.[7]

He also describes the method of splitting the feathers and lashing them to the shaft. Sometimes the small end of the feather near the nock was not only inserted into a slit in the wood but was lashed.

UTKIAVIK-NUWUK: Fragments of arrowshafts occur very frequently at all the sites in the Point Barrow Area. Generally these are short and charred on one or both ends because they have been used, secondarily, as lamp trimmers. The majority are too short to provide specific information as to the characteristics of arrows other than diameter; most of them are round in cross-section, and about 1 cm. in diameter.

Two arrow fragments that included the nock were found in House A, Utkiavik. In all details except that one had been painted red,

[7] Murdoch, 1892, 201.

apparently with ocher, the fragments conformed exactly to Murdoch's description; the round shafts became flattened ovals towards the nock, and the marks made by the binding that held both ends of the feathers showed clearly on the soft spruce. Their total length could not be determined.

NUNAGIAK: The butt ends of arrowshafts, identical to those described above, were found in Mound C at Nunagiak: one from Entrance D, one from Cache B, and one from Structure E. Several arrowheads and one complete arrow (Fig. 22) accompanied the fragmentary Burial 1 in Mound C. The antler head of the complete arrow conforms to the class "knobbed tang, barbed with stone blade." The butt of the stele is a flattened oval in cross-section; the notch has been broken off. Marks made by the whipping that secured the feathers at both the upper and lower ends show plainly. Forward of the feathering the shaft becomes round; it has a diameter of 1.1 cm. The shaft diameter increases gradually to the socket for the tang of the arrowhead where it is 1.3 cm. It is 52 cm. long, and the head is 15 cm. long, thus giving an over-all arrow length of 67 cm. (26.4 inches).

Three arrow fragments from Entrance D, Mound C, apparently had neither antler nor stone points. The ends of the shafts swell slightly, then round to a point. Although the diameters of the shafts are about 1 cm., as is the average man's arrow, these are probably fragments of toys.

A toy arrow which is widened just ahead of the nock to simulate the feathering is from the Punuk Period house in the beach sand below Mound C (Fig. 21a).

BIRNIRK: Arrow fragments from Birnirk are not essentially different from those described above. Flattened nock ends bearing marks made by the feather bindings were found at the roof and floor entrance of House A, Cut 2, Section 4, Mound A; floor of House A, Mound R; and from Cut 13, Section 4, Mound J.

A bundle of four arrows lying parallel to one another was found in Structure G, Mound A. The points all had knobbed tangs. The shafts of these arrows, from 44 to 45 cm. in length, are flattened and widened near the nock; they are round in cross-section and measure about 1 cm. in diameter forward of the nock, increasing slightly in diameter towards the socket for the antler point.

A curious arrow made of two strips of baleen tied together came from directly below the floor of Structure B, Mound A. It has an unbarbed antler point with a knobbed tang.[1]

KUGOK BURIAL MOUNDS: An isolated find in the Kugok burial area in Mound B, possibly associated with a burial that had been previously removed by Hopson, was a bundle of arrows with ivory heads (Fig. 8, Find 6). Ten arrowheads were found (Fig. 61a–f). The shafts are so badly broken that it is not possible to determine how many were included in this bundle. It was possible to reconstruct only one arrowshaft. This is slightly flattened at the nock, round in section, about 0.8 cm. in diameter, increasing in diameter to 1.3 cm. near the socket for the head. Marks of the binding for the feathers show plainly. This shaft is somewhat longer than the arrowshafts described above; it measures 58 cm. in length.

ARROWPOINTS

Murdoch describes four different kinds of arrows in use at Point Barrow.[2] His description may be condensed as follows:

1. Bear arrows, three varieties:

a. Simple flaked points of black or gray flint. These vary from long, narrow, parallel-sided points to squat points almost as broad as they are long. Murdoch describes four styles.

b. Flaked flint points attached to bone "after-piles" with a single barb. This "after-pile" is the point listed in the following descriptions as "spurred tang with barbs and stone points."

c. Similar to the second, but metal points were substituted for the chipped flint.

2. Deer arrows made of antler, with bayonet-like points, are triangular in section, with only one edge sharpened; the edge has one to three barbs. This corresponds to the class described below as "spurred tang with multiple unilateral barbs."

3. Arrows for large birds. Murdoch states that these are made of ivory. Otherwise, the form is essentially similar to the deer arrows described above. A few ivory points in the present collection, described below as "spurred tang with multiple unilateral barbs," probably belong to this category.

4. Blunt arrows for small birds. Murdoch describes four points of this class, all with cleft tangs. As will be seen, two other methods of attaching the point to the shaft are included in the "blunt point" class described below.

[1] A similar baleen arrow was found at Naujan: Mathiassen, 1927a, 38, Pl. 35, Fig. 3.

[2] Murdoch, 1892, 201–207.

For establishing chronology for the north coast of Alaska, arrowheads, usually made of antler, are almost as useful as harpoon heads. The most consistent distinguishing feature is the shape of the tang. The sequence of what are here called "tapering tang," "knobbed tang," and "spurred tang" was first described by Collins on St. Lawrence Island[1] and later by Larsen and Rainey on the basis of the material excavated by them at Point Hope.[2] This chronological outline seems just as valid for the Point Barrow Area, so is used as an over-all outline for the classification of the 439 arrowheads in these collections.

BLUNT ARROWPOINTS FOR BIRDS

Blunt arrowpoints for killing small birds are found only in recent deposits of the Utkiavik Period. The blunt ends of the points are usually cut into four segments, very similar to the point of a star drill. There are three methods of fastening the points to the shafts. As there appears to be a size division in one of these, the bird arrows are described in four groups. Because these blunt points are somewhat distinct from the deer arrow tradition as tabulated in Fig. 63 and are relatively few in number, the proveniences are listed after a brief description of each class.

Small wedge tang bird points are fairly common (Fig. 57q). Four of the eight specimens are of ivory; the remainder are of bone. Lengths range from 3 to 5.5 cm.; the diameters, from 0.75 to 1.5 cm. The tangs are wedge-shaped; evidently the arrowshaft had a V-shaped scarf to receive these points. Two examples of this class were purchased in a collection from Nuwuk, and seven were bought in a collection from the abandoned part of Utkiavik.

Large wedge tang bird points (Fig. 57r) are identical in shape with the small points described above, but larger. They range from 6 to 8 cm. in length and from 2 to 2.5 cm. in diameter. One head was purchased, identified only as from the Point Barrow vicinity; one came from Utkiavik, House A Floor; and one, from Nunagiak, Cut 3, Section 4, Mound D.

The third group has split tangs (Fig. 57t–u). Six of these were purchased from Utkiavik and one from Nuwuk.

[1] Collins, 1937, 324.

[2] Larsen and Rainey, 1948, 169–179, Fig. 51.

The most numerous variety are blunt points with drilled sockets into which the arrowshaft was inserted (Fig. 57n–p). All are from the late houses of Nuwuk (10 purchased) and Utkiavik (five purchased, and two from the floor of House A).

SOCKETED ARROWPOINTS WITH SINGLE BARBS

The archeological material purchased from the Eskimo from the recently abandoned houses in Utkiavik Village contains two arrowpoints of an unusual type (Fig. 57v–w). Made of bone, about 7 cm. long, each arrowhead has a drilled socket in the base, into which the arrowshaft was inserted, and a single barb.

ARROWPOINT BLANKS

What appear to be crudely carved blanks prepared for making arrowpoints are a feature of the Nunagiak and particularly of the Utkiavik phases of Eskimo culture (Fig. 57h–m). Typically, these pieces of antler average 16 cm. in length (range, 9.5 to 20 cm.) and are crudely sharpened at both ends. It is usually possible to distinguish the end intended for the tang, for this has been cut with more taper than the point end. These blanks were cut from the antler in characteristic fashion with the composite knife. Parallel trenches made in the hard outer cortex were deepened until they penetrated into the spongy antler core, which was then broken and the slender rod of antler trimmed at each end.

It is not certain that all the specimens so classified are actually arrowpoint blanks. Some may have been considered finished points, as there is no reason why these crude points would not have been as effective as the more carefully finished examples.

SPURRED TANG ARROWPOINTS WITHOUT BARBS

Figure 57a–g

The tangs of these points have well-marked shoulders separating them from the body. Tiny projections carved on opposite sides of the tang, usually placed a little nearer the shoulder than the tip of the tang, are definitive characteristics. These points tend to be round in section; of 41 in this category, 27 are round and

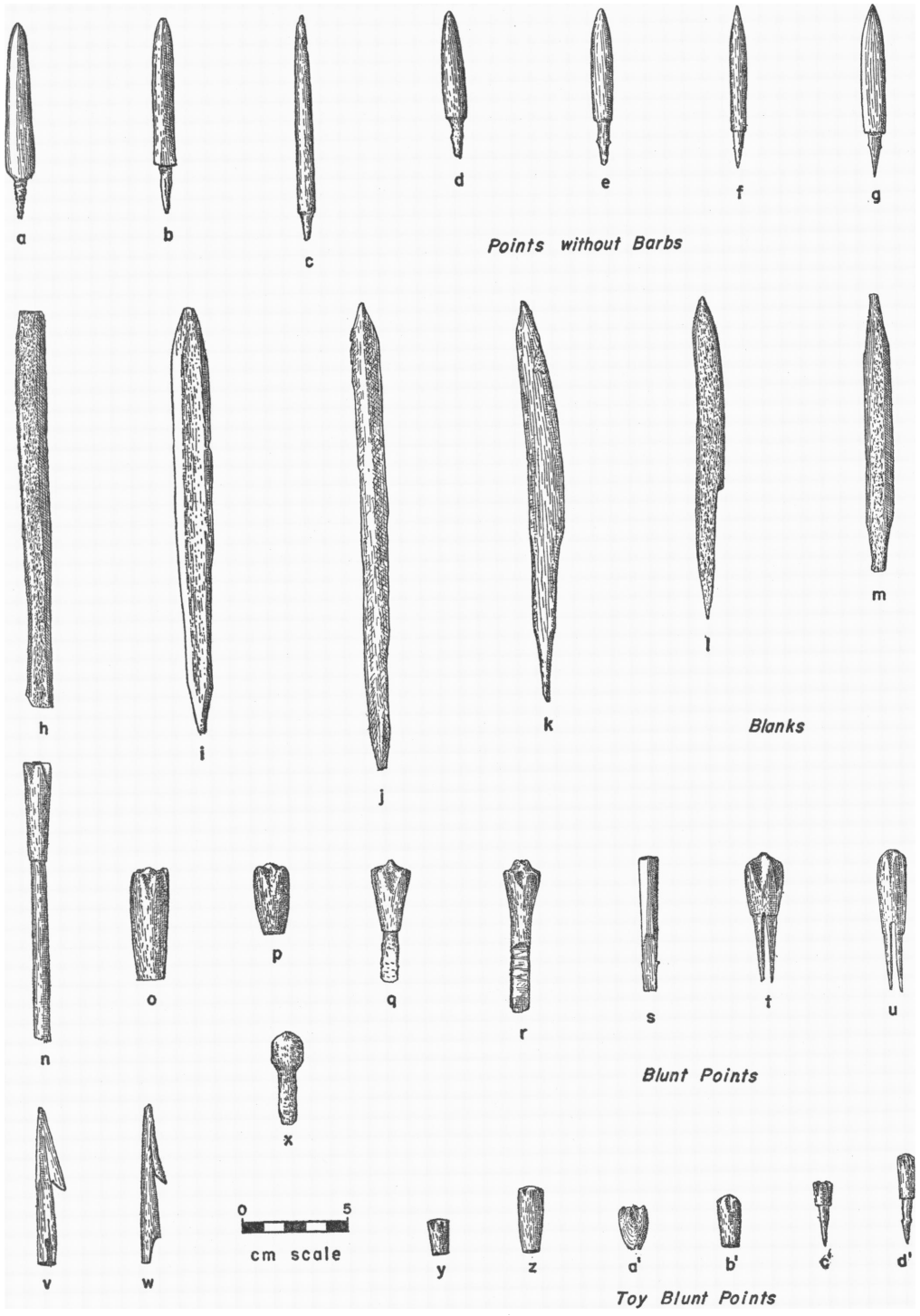


FIG. 57. Antler arrowpoints, principally from Nuwuk and Utkiavik.

14 are slightly flattened ovals. The heads, which are relatively short, averaging about 8 cm. and ranging from 4.9 to 12.8 cm., have no barbs; all taper to a simple, not very sharp point. Two of the points are made of ivory, and the balance are of antler.

SPURRED TANG ARROWPOINTS WITH BARBS AND STONE POINTS

Figure 58o–s

These arrowpoints have the well-defined shoulder and tapering tang with tiny spurs on opposite sides that characterize most of those of the Utkiavik Phase. They are made of deer antler and average 10 cm. in length (range, 9 to 14 cm.). Above the tang the stems are round or oval in cross-section. Towards the tip they have one, or sometimes two, pronounced barbs placed only on one side. At the tip is a socket, lens-shaped in section, which is slit so that its two sides may be pulled together with binding to clamp the butt of a stone point. The broad groove to hold the binding is usually well made. Chipped flint points (described below) were used in this variety of antler arrowhead.

Arrowheads of this type were in use in the latter part of the nineteenth century. Several examples collected from the Point Barrow vicinity are described by Murdoch.[1] They were used for hunting large game such as polar bear.

SPURRED TANG ARROWPOINTS WITH MULTIPLE UNILATERAL BARBS

Figure 58t–x

Arrowpoints of this type, also used in the vicinity of Point Barrow until the 1880's, are described by Murdoch as "deer arrows."[2] Although the single specimen figured by him has a small knob on the tang, all those in the present collection have the well-marked shoulder and the two tiny spurs that are so characteristic of Utkiavik Period arrowpoints. Points of this type are made of antler. Their lengths range from 11 to 17 cm. In section they are triangular or diamond-shaped. The sharpened edge bears the barbs which number from two to four. A single line incised lengthwise at the base of the barbs is found on some arrowpoints. Some arrows have ownership marks (Fig. 62).

[1] Murdoch 1892, 202–205.
[2] Murdoch, 1892, 205, Fig. 187.

SPURRED TANG ARROWPOINTS WITH SINGLE BARBS

Figure 58a–h

These arrowpoints are similar to the multiple-barbed type described above except that there is only a single barb. The barbs range from slight shoulders on the edge of the blade, which probably should not properly be termed "barbs" (Fig. 58h), to true, free-standing barbs that have been separated from the blade for several centimeters (Fig. 58c). An incised line, often found parallel to the edge of the blade, emphasizes and continues the separation of the barb from the blade of the arrowpoint.

SPURRED TANG ARROWPOINTS WITH BARBS AND NOTCHED POINTS

Figure 58i–n

Most of these arrowpoints are identical to the single-barbed, spurred tang arrows described above, except that two notches have been cut near the point. In contrast to the smoothed finish of the other parts of the arrowpoints, these notches are rough knife cuts. Evidently they were made on finished arrowpoints, possibly some time after they were manufactured, so that the extreme tip of the point would break off and remain in the wound.

LONG SERRATED BARBED ARROWPOINTS WITH SPURRED OR KNOBBED TANGS

Figure 59g–m

An outstanding feature of this small group of arrowpoints is their length: average, about 22 cm.; range, 16 to 28 cm. Two points from Utkiavik, without exact provenience, are of ivory; the remainder are made of antler. The ivory heads, although triangular in cross-section, have barbs and tangs similar to the other heads of this type. The antler specimens have blades that are lens-shaped in section, with two sharp edges. Only one edge is barbed, having a single barb or, more frequently, multiple barbs formed by narrow cuts made at an angle (Fig. 59g). Below the barbs towards the tang the points are either oval or round in section.

The shoulders separating the tangs from the body tend to be less pronounced than those of other arrowpoints of the Utkiavik Period, and the tangs are generally longer and more taper-

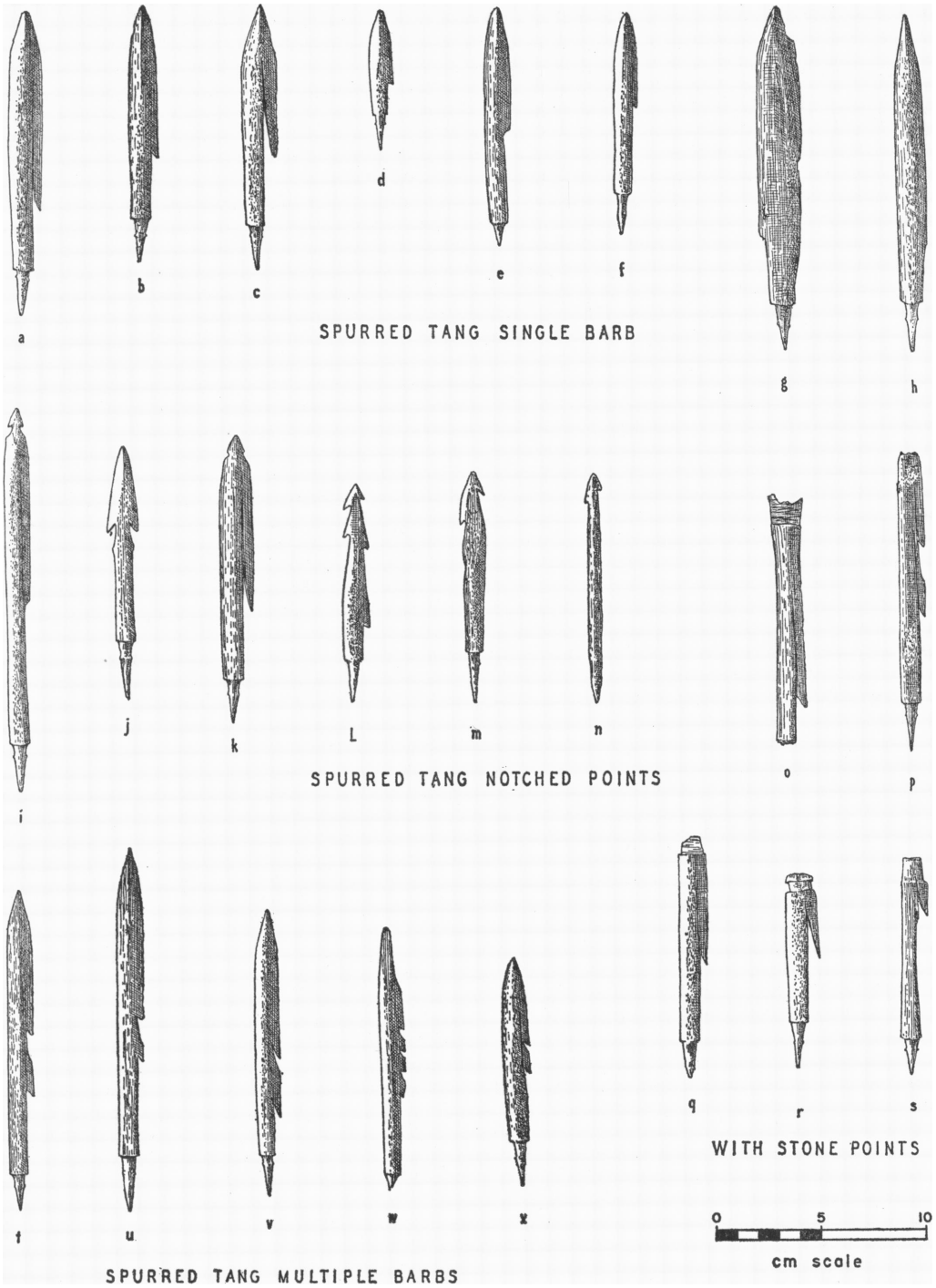


FIG. 58. Antler arrowpoints, principally from Nuwuk and Utkiavik.

ing. About half of the tangs have tiny spurs on opposite sides; on the remainder a narrow raised ridge encircles the tang, ridges that are neither so large nor so rounded as the bulbous tangs found in Birnirk Period arrowpoints.

KNOBBED TANG ARROWPOINTS WITH UNILATERAL BARBS

Figure 59a–f

The 14 arrowpoints in this category are made of antler. In length they range from 14 to 25 cm., but the average is rather long, about 18 to 20 cm. Their distinguishing feature is the shape of the tang. No sharp shoulder separates it from the body of the arrow as on most of the points of the Utkiavik Period. At most there is a very slight, rounded shoulder. Most of them have no shoulder at all, merely a change in the outline of the arrowpoint to mark the point where the tang begins. Halfway down the tang there is a characteristically formed knob.

In cross-section the blades of these arrows are a flattened diamond shape. One or two free-standing, rather sharp barbs are carved in one edge of the blade nearer the tang than the tip. Most of the blades increase slightly in width above the barbs before they taper to a sharp point.

On the edge of the blade opposite the barb and only 2 cm. from the tang, one point of this type, from Nunagiak, Structure E, Mound C, has a rise so slight that it might easily be overlooked (Fig. 59d). This is a vestige of a slot for stone side blades, as is demonstrated below in the discussion of arrowpoint development.

KNOBBED TANG ARROWPOINTS WITH END SLOTS FOR STONE BLADES

Figure 60

This is a small class represented by only eight specimens. Curiously enough, all but two were found accompanying burials in Structures G and H, Mound A, Birnirk, and in Mound C at Nunagiak (Fig. 22). This explains why five were found complete with wooden shafts. All these points are made of antler. As a group, they are longer than any other type from the Point Barrow Area, ranging from 16 to 30 cm. and averaging about 22 cm. The tangs have the rounded shoulders and pronounced knobs typical of the Nunagiak Period. Above the tangs the piles are oval in cross-section, and the blades tend to be lens-shaped. Two points have no barbs, three have one, two have two, and one has four small barbs; all are on the same side. The remaining point has two small vestigial barbs opposite each other.

The blade slot at the end is the distinctive feature of this class. No blades were found in place, but the slots are quite narrow and are cut so that the tips must be forced apart for the insertion of the blade, as in many harpoon heads. Evidently a slate or metal blade was used, for the slots are too narrow to accommodate chipped blades.

TAPERING TANG ARROWPOINTS WITH UNILATERAL MULTIPLE BARBS

Figure 61f–i, k–n

Most of the arrowpoints found in Birnirk Period sites can be differentiated from later forms by their characteristic tang. Slight rounded shoulders separate the tang from the body of the arrow. From the shoulder to within 1 cm. of the tip the tang has about the same diameter or tapers very slightly. On some arrowpoints there is a very slight rounded swelling at the lower end of the tang, but this is never so pronounced as on points of the Nunagiak Period. The tip of the tang tapers to a rather sharp point. In contrast to later forms the tangs are frequently roughened.

The arrows of the unilateral multiple barb class are made of antler. The length ranges from 13 to 21 cm. and averages about 16 cm. Above the tang the pile is oval in section, and the blade portion is lens-shaped. Two or more barbs are placed on one side of the blade. Two barbs are most common, but as many as six occur. These barbs are free standing and are rather sharp. Above the barbs the blades of most of the points are slightly widened into a graceful curve before they taper to a rather sharp point. Three of the points each have the two pairs of slight rises just above the tang that appear to be vestiges of once functional slots for stone side blades (Fig. 61d–e). These come from Birnirk, below the floor of Structure B, Mound A; Kugok, Find 6, Burial Mound B; and Nunagiak, Entrance D, Mound C.

A four-barbed arrowpoint found in the bundle of arrows from Burial Mound B of the Kugok Burial Site near Utkiavik (Find 6) gave a clue to the significance of these small bumps

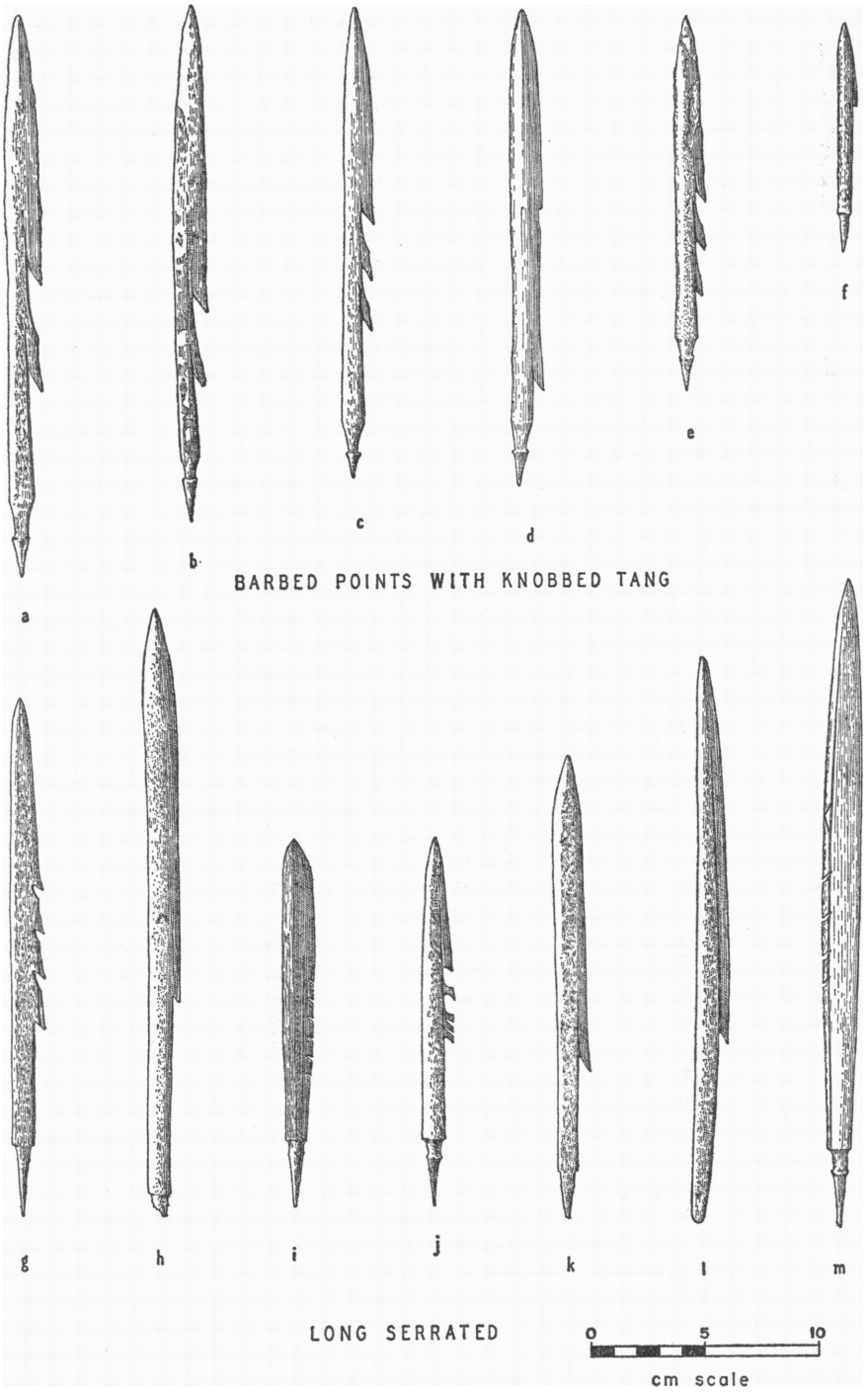


FIG. 59. Antler arrowpoints, principally from Nunagiak.

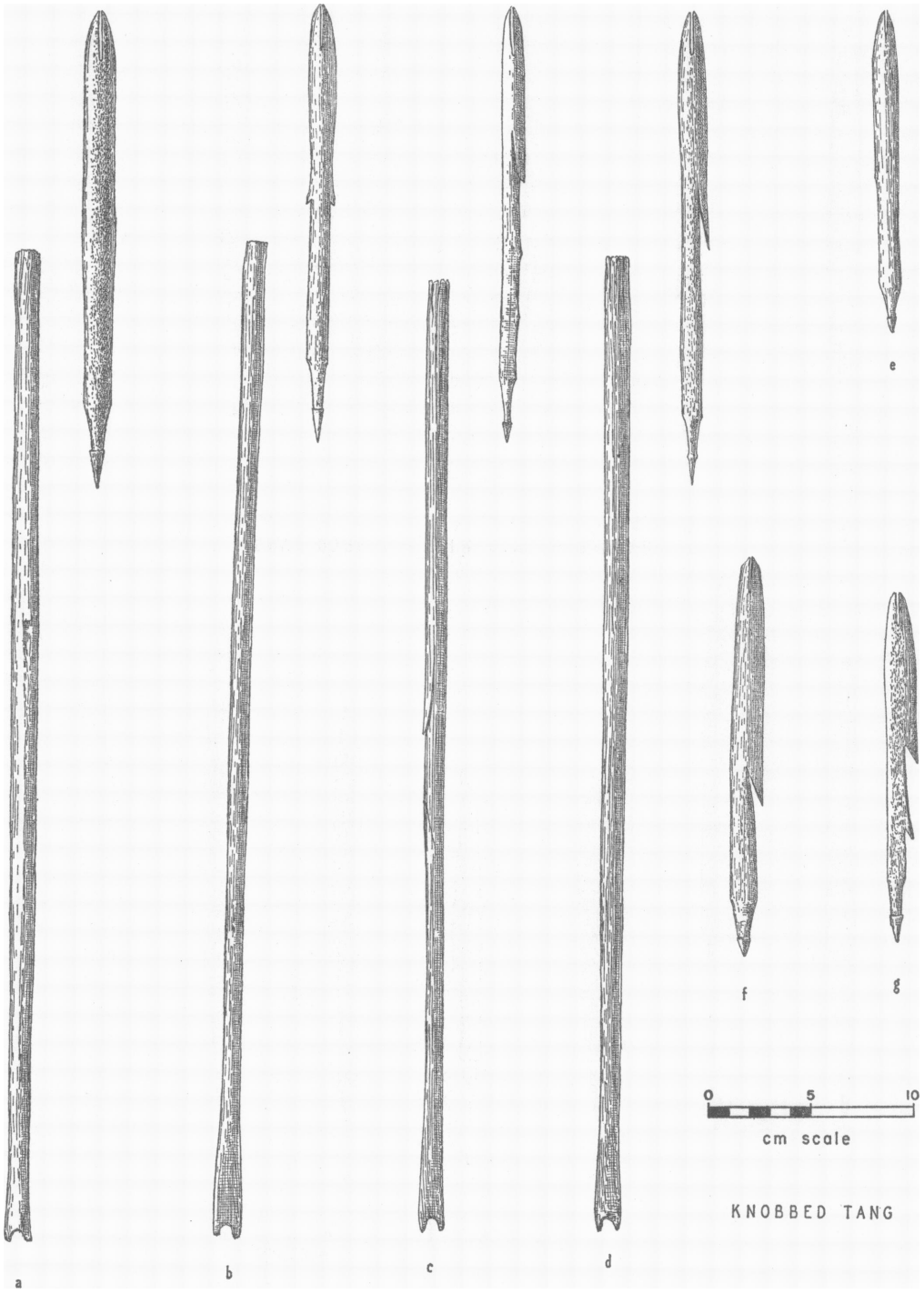


FIG. 60. Arrows and antler points with knobbed tangs, principally from Birnirk.

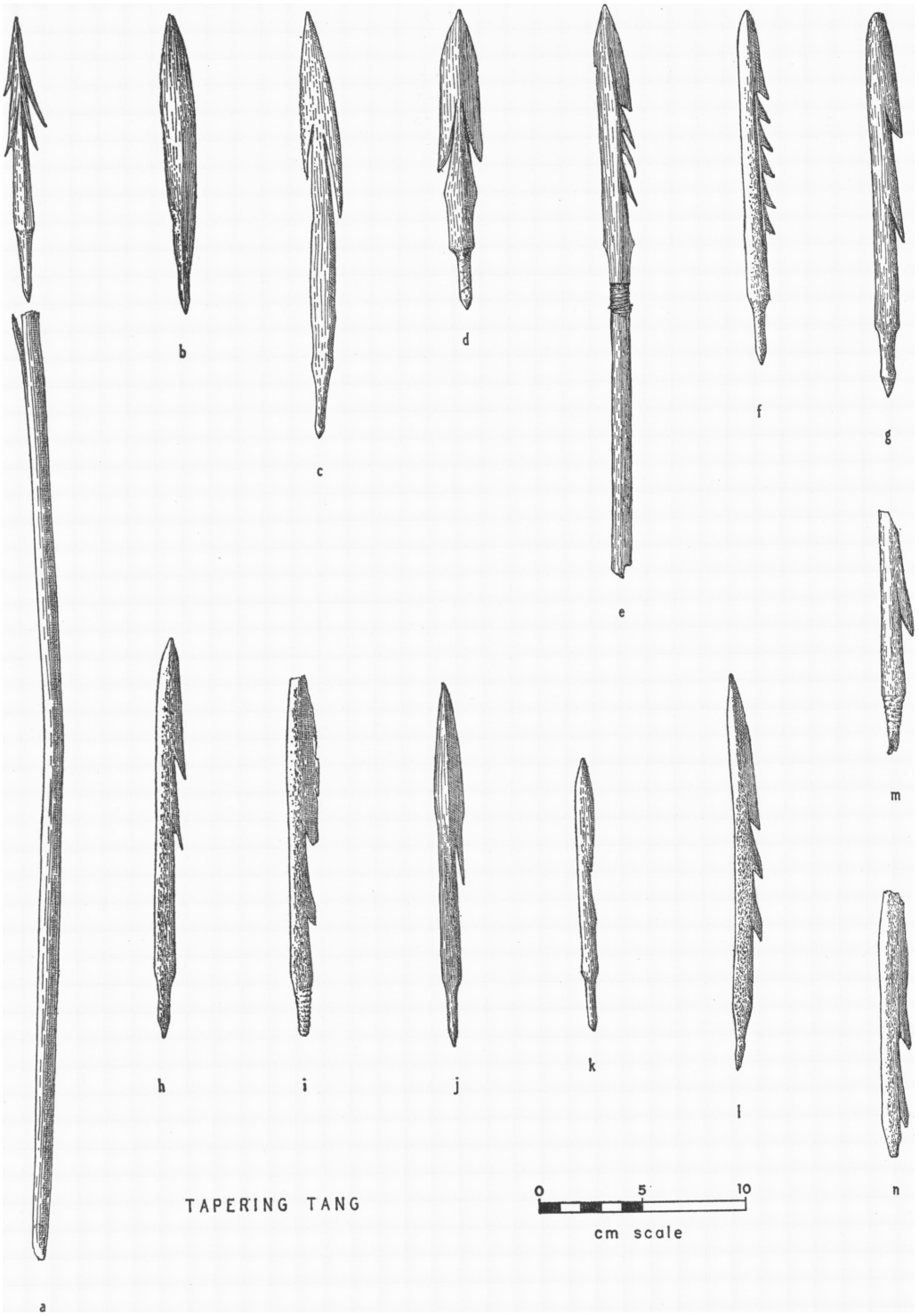


FIG. 61. Arrows and points with tapering tangs from Kugok, Birnirk, and Nunagiak. a–d, f–n. Antler. e. Ivory.

near the butt of the Birnirk Period arrows (Fig. 61e). Below the bumps this arrowpoint has nonfunctional blade slots on each side of the point —slots too shallow to have held stone side blades. Evidently Birnirk Period arrows derived these vestigial slots from a phase of culture in which the arrows did have stone side blades.

TAPERING TANG ARROWPOINTS WITH SINGLE BARBS

Figure 61j

All the arrowpoints in this class are made of antler. They differ from the preceding class in having only one instead of two barbs. The distinction, however, is probably more formal than real. They are also shorter than the points with two barbs, ranging from 13 to 20 cm. and averaging about 17 cm.

TAPERING TANG ARROWPOINTS WITH OPPOSING BARBS

Figure 61a, c–d

These arrowpoints are made of walrus ivory. Lengths range from 14 to 20 cm. The tangs have rounded shoulders, parallel sides, and pointed ends as do the types described above. Above the tang, two points have the opposed slight swelling of the shaft that has been interpreted as a vestigial side blade slot (Fig. 61d). The points are rounded oval in cross-section near the tang, and the blades are lens-shaped. Two to four barbs arranged on opposite sides of the blade are distinguishing features. Usually, however, the barbs are not symmetrically placed opposite one another. Three may be on one side of the blade and one on the other. The barbs are free standing, lie close to the body of the points, and are quite sharp.

TAPERING TANG ARROWPOINTS WITHOUT BARBS

The three specimens found were made of antler (Fig. 61b). They range in length from 13 to 17 cm. In all respects the tangs are similar to those on the other points of the Birnirk Period. The sharp-edged blades are lens-shaped in section. In outline the blades widen before they curve inward to rather sharp points.

UNCLASSIFIED ARROWPOINTS

One specimen made of antler, from the floor of the house uncovered at Birnirk, Mound B, has the typical straight tang of the Birnirk Period arrows. Above the tang there are the opposed low rises that may be vestiges of side blade slots. Above that the arrow blade is oval and at the point has a blade slot. Its total length is 13 cm.

COMPARISONS OF ARROWPOINTS

The provenience of the 439 ivory and antler arrowpoints from sites in the Point Barrow Area is tabulated in Fig. 63. The localities on the left-hand side of this diagram are arranged in the same sequence as in the tabulation of harpoon heads (Fig. 34), with the older sites at the bottom and the modern refuse deposits at the top of the figure. These data obviously corroborate the sequence of tang forms as set forth originally by Collins and Larsen and Rainey.

UTKIAVIK-NUWUK: All the blunt arrowpoints used to kill small birds came from the Nuwuk and Utkiavik middens. Although blunt arrowpoints seem to be recent in the Point Barrow Area, they have a respectable antiquity to the south as well as in Asia. Rudenko illustrates a socketed head with a point like a star drill from the Uwelen-Okvik deposits at the Uwelen Site on the Siberian Coast.[1] Later, Old Bering Sea and Punuk Period blunt points from this coast are also socketed, but they have oval rounded tips.[2] Split tang bird points with rounded tips were found by Rudenko at the Sirhenik Site, a short distance west of Indian Point. Apparently these are late in the Punuk Stage.[3]

On Punuk Island blunt points with sockets, with and without petaloid decorative ridges, and rounded blunt points with pointed tangs for insertion in the arrowshaft were found in the Okvik deposits.[4] Strangely enough, blunt arrowpoints were not found in the intervening Old Bering Sea Period deposits at Gambell on St. Lawrence Island. The round socketed form reappears in the Punuk Stage to survive in slightly modified form until modern times.[5]

At the sequence of dated sites on the Kobuk River, Giddings found blunt arrowpoints with wedge-shaped tangs and lobes surrounding a

[1] Rudenko, 1947, Pl. 2, Fig. 10.
[2] Rudenko, 1947, Uwelen, Pl. 4, Fig. 14, Pl. 5, Figs. 13–14.
[3] Rudenko, 1947, Pl. 22, Figs. 2, 4.
[4] Rainey, 1941, Fig. 14, Items 10–16.
[5] Collins, 1937, 324–325.

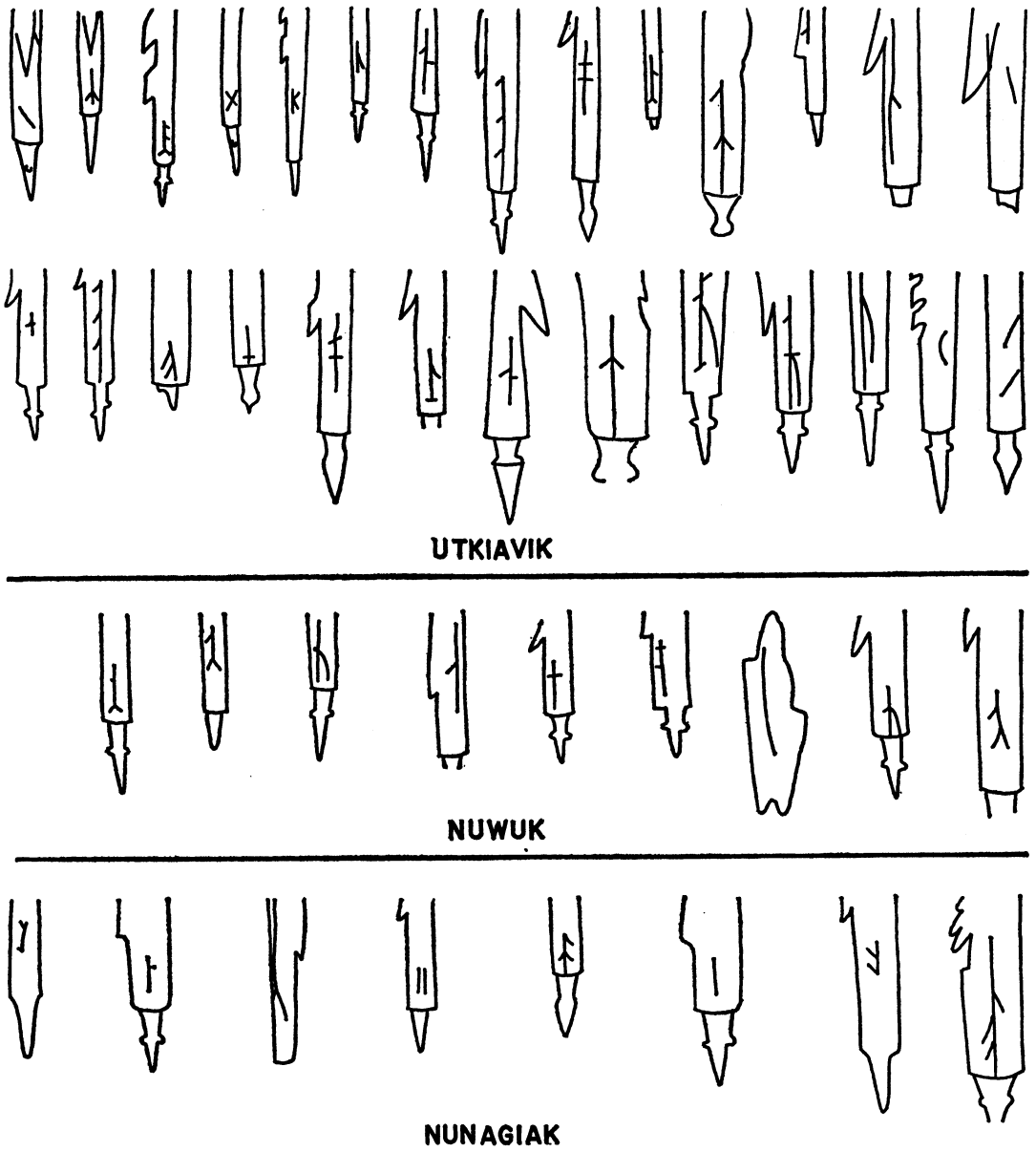


FIG. 62. Ownership marks on arrowpoints from Nuwuk, Utkiavik, and Nunagiak.

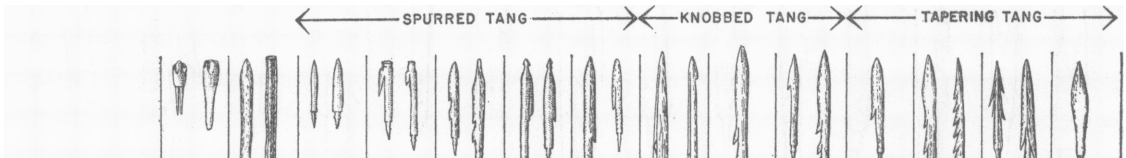
flattened tip at the Ahteut Site (1250 A.D.). According to Giddings,

> Between 1400 and 1500 A.D. on the Kobuk River the prevalent wedge-shaped tang gave way to a drilled socket, which was not found in the earlier sites; and multiple lobes surrounding a flattened tip changed to petaloid lobes secondary to a prominent, conical tip.[1]

[1] Giddings, 1952, 51.

Blunt points for birds were found in both the houses and burials of the Ipiutak Culture at Point Hope. One specimen had a spatulate tang, but all the others were socketed.[2] Four of the points have a tip like a star drill which, though more elaborate, is basically similar to that of the recent specimens from Point Barrow.

[2] Larsen and Rainey, 1948, 67.



	Blunt points	Arrow blanks	w/o barbs	w/ barbs & stone	Multiple unilateral barbs	Single barb notched points	Single barb	Long. serrated	Barbed w/ stone blade	Unilateral barbs	Single barb	Multiple unilateral barbs	Opposing barbs	w/o barbs
NUWUK (Purchased)	15	9	2	10	6	1	18							
Cut 1 - S1					1		1							
S2							2							
UTKIAVIK (Purchased)	17	23	33	23	21	15	101	4						
Mound A House A	2					1	5	2		2				
Cut 1 - S1		2	2											
S2										1				
Cut 2-S1		1			1		1							
S4			1											
S5							1							
S6		1												
Cut 3 - S1							1							
House B		1		1	1			1						
NUNAGIAK (Purchased)		2	4	1	1	1	11	10		7	2	1		
Mound A Cut1-S1							1							
S3							1							
Mound B Cut2-S2							2							
S4		1												
S5			1		1		2							
Punuk House (P)									1	1		2		
Mound C Cut 4				1								1		
S4											1			
Entrance D							1					1	1	
Structure E										1				
Burial 1									2	2				
Find 1										1				
BIRNIRK Md.A H.A. Floor												1		1
Ent. Floor											1			
Str. B Floor2												1		
Str. D												1		
Cut 2 - S4												1		
Cut 3 - S2												1		
Cut 12-S1											2	2		
Str. G									4					
Str. H									1		1			
Str. E											1			
Str. F									1					
Mound J Cut 13-S2		1												
S3													1	
House A floor												1		
Mound D Cut 7 - S6												1		
Mound C above floor											3	1		
Mound R House floor											1			
KUGOK Mound B Find 3											1			
Find 6												4	4	2

FIG. 63. Tabulation of the occurrence of arrowpoints of different types.

Larsen and Rainey's collections for the intervening Birnirk and Thule periods are limited, so the absence of blunt points in these collections is perhaps not very significant. This feature occurs in the recent Tigara rack burials.[1] Three have wedge-shaped tangs, and one has a split tang.

De Laguna, Larsen and Rainey, Giddings, and Collins have all discussed the history of arrowpoint forms and repeatedly have called attention to the fact that the form of the tang is the most obvious and consistent time marker.[2] Giddings found the earliest examples of the shouldered tang, with small opposite spurs characteristic of the points from Utkiavik and Nuwuk, at his Old Kotzebue Site for which he has tree-ring dates clustering about 1400 A.D.

[1] Larsen and Rainey, 1948, Pl. 93, Fig. 4.

[2] De Laguna, 1947, 201–210; Larsen and Rainey, 1948, 169, Fig. 51; Giddings, 1952, 49–50; Collins, 1937.

Aside from this, these features are shared principally with the Thule Culture of Central Canada as has been remarked by Collins.[1]

The weak-shouldered, knobbed-tang varieties of arrowpoints that are especially characteristic of Nunagiak are also found at the earliest of the Canadian Thule Culture sites, Naujan.[2] Giddings found this variety of tang at the Ahteut Site on the Kobuk, for which he obtained a date of 1250 A.D. In the St. Lawrence Island chronology this feature begins in the Punuk Period.[3]

Murdoch's description of form is also quite adequate, for the present collection could be classified according to the four types he describes, but for present purposes some simplification appears desirable.

CLASS 1: Long narrow projectile points with blades diamond-shaped in section, rather thick in comparison to width (Fig. 64). The chipping is nicely done; it could almost be termed "ripple flaking." The shoulders are square and unbarbed. The relatively short stems have parallel sides with square bases. These points

FIG. 64. Classes of flint arrowheads.

The tapering tang arrowpoints with free-standing barbs and sometimes with slots for end blades of stone from Birnirk, Kugok, and Kugusugaruk bear a striking similarity to the Old Bering Sea and Okvik Period points from St. Lawrence Island.[4] There is a more generalized relationship to the several types of Ipiutak Culture heads.

CHIPPED FLINT POINTS

According to Murdoch,[5] as quoted in the foregoing pages, chipped flint arrowpoints were intended for use against bears. Either the points were mounted directly on the wooden shaft or they were affixed to the bone head with a socket, described above as "spurred tang with barbs and stone points." As noted by Murdoch, the points in the present collections are made of a dark, almost black chert, a gray, somewhat "waxy" chert, or, rarely, of jasper. The jasper tends to be brown or reddish in color.

[1] Collins, 1937, 324.
[2] Mathiassen, 1927a, Pl. 8, Figs. 2, 6.
[3] Collins, 1937, 323–324.
[4] Collins, 1937, Pl. 34; Rainey, 1941, Fig. 14, Items 1–6.
[5] Murdoch, 1892, 202–204.

are identical with Murdoch's Fig. 183. Although the proportions and other features are the same, these points range from 9.5 cm. down to a length of 3.5 cm. The shorter points formed Murdoch's second group.

CLASS 2: Chipped stemmed points with rather sloping shoulders. These formed Murdoch's third group. Points of this class in the present collections are not so competently chipped as those described above (Fig. 64).

Murdoch's last class, a straight-stemmed point with a blade about as broad as long, was represented in his collection by a single newly made point. None appears in the collections described here.

CLASS 3: A distinctive type of projectile point not described by Murdoch is associated with the forms listed above. This is a relatively long, narrow, unstemmed point with a squared, thinned base. In outline it resembles Larsen and Rainey's Type 1, but differs in that it is thicker in cross-section (Fig. 64).[6]

Murdoch has described the manufacture and use of the preceding categories of flint points.

[6] Larsen and Rainey, 1948, Pl. 2, Figs. 1–6.

TABLE 1

FLINT ARROWPOINTS

Site	Classes 1	2	3	4	5	Fragmentary
Nuwuk						
Purchase	7	4	1	—	—	15
Utkiavik						
Purchase	19	7	9	—	—	9
Over House A	1	3	—	—	—	—
Floor of House A	—	2	1	—	—	—
Over entrance of House A	—	2	—	—	—	—
House B	1	—	—	—	—	—
Cut 2, Section 1	1	—	—	—	—	—
Nunagiak						
Cut 2, Section 1	—	1	2	—	—	—
Cut 2, Section 2	—	1	—	—	—	—
Cut 2, Section 3	—	3	—	—	—	—
Cut 2, Section 4	1	1	—	—	1	—
Cut 2, Section 5	—	—	—	1	—	—
Cut 2, Section 6	—	2	—	—	—	—
Cut 4, Section 1	—	—	—	—	3	—
Cut 4, Section 4	—	—	1	1	—	—
Mound C						
Above House 4	—	—	—	1	—	—
Find 1	—	—	—	1	—	—
Birnirk						
Mound A						
Cut 2, Section 1	—	—	—	1	—	—
Cut 2, Section 6	—	—	—	1	—	—
Cut 4	—	—	—	—	2	—
House E	—	—	—	1	—	—
Floor of House H	—	—	—	3	—	—
House D	—	—	—	—	1	—
House G	—	—	—	—	2	—
Mound B						
Floor of House A	—	—	—	1	—	—
Mound I						
Cut 9, Section 1	—	—	—	—	1	—
Mound J						
Cut 13, Section 2	—	—	—	—	1	—
Floor 1 of House A	—	—	—	—	1	—
Floor 2 of House A	—	—	—	—	1	—
Kugok						
Mound B						
Burial 8, Find 5	—	—	—	—	3	—
Burial 1, Find 1	—	—	—	—	2	—

There can be no doubt that these are arrowpoints. However, there can be no such certainty about the chipped implements described below. In general, the points in this group are very well flaked on both faces and are quite thin in section, in contrast to the rather thick diamond-section arrowpoints listed above. The materials are a dark, almost black, chert, a gray-brown chert, and a translucent stone, possibly chalcedony.

CLASS 4: Thin, wide, well-chipped points with slight shoulders, curving blade edges. The stems, which form almost one-half of the length of the points, have either straight or curved

bases. These average about 6 cm. in length and range from 4 to 9 cm. (Fig. 64).

CLASS 5: Willow-leaf shaped points without separate stems. These are also quite thin and are well chipped. The edges of the blades curve to the tip, but the bases are either rounded or almost straight, approaching a triangular form. In length these blades range from 2.7 to 8 cm. (Figs. 64, 9g–j).

The provenience of the various forms of chipped projectile points is given in Table 1. The narrow thick points that were still being made in Murdoch's time, Classes 1 to 3, were all found in the late sites, Nuwuk and Utkiavik, and the recent deposits at Nunagiak, particularly Cut 2. The broad, thin, nicely chipped points, both with the characteristic U-shaped stem (Class 4) and the unstemmed (Class 5), came from the older deposits at Nunagiak and were the only types found in the Birnirk deposits. The Kugok burials yielded only the leaf-shaped and triangular blades of Class 5.

COMPARISONS: Chipped implements of chert and similar materials are not abundant on St. Lawrence Island and are more characteristic of the Old Bering Sea Period than of later cultural stages. From the Hillside Site, Collins describes thin, well-flaked, leaf-shaped points that are similar to Class 5 points. Slightly larger stemmed forms were possibly knife blades. These have wide stems and slight shoulders, as do the points of Class 4, but the bases of the stems tend to be somewhat straighter than is usual in the Point Barrow Area.[1]

Giddings' dated sequence from the Kobuk River parallels the Point Barrow sequence and suggests dates in the latter region as follows:

GIDDINGS' SEQUENCE[2]	POINT BARROW CLASS
1250 A.D. Thin, stemless, wedge-shaped points	Class 5
1400 A.D. Thin, wide-stemmed, Ekseavik, Type A points	Class 4
1550 A.D. Transitional to following	
1750 A.D. Long, parallel-sided points with rhomboid cross-section and small rectangular stem	Class 1

The Ipiutak Culture finds at Point Hope include only a few stemmed points that could have been used to tip arrows. Some of these rare forms are similar to the wide-stemmed, weak-shouldered, Class 4 form found at Barrow.[3] An exact parallel to the more common, stemless, Ipiutak arrowpoints does not occur in the collections from the Point Barrow Area. From the Thule Period and recent remains at Point Hope, Larsen and Rainey illustrate points directly comparable to the Point Barrow Class 1.[4]

Mathiassen identifies flaked points with stems as harpoon blades. This is probably correct. In any event, these side-notched and stemmed forms are not identical with any of the points in the Point Barrow sequence.[5]

The thick, parallel-sided arrowpoint with a rectangular tang (Class 1) has been found as far east as Barter Island.[6] This particular late form probably does not extend much farther east and is essentially a northwestern Alaska development.

WRIST GUARDS

UTKIAVIK: It is unusual that wrist guards for protection from the bowstring were found only at the recent site of Utkiavik. One was discovered in House B (Fig. 53f). This is almost identical to a newly made specimen collected by Murdoch.[7]

Sixteen wrist guards are included in the collection purchased from various Eskimo diggers. All are thin plates curved to fit the wrist, with small slots on the edges for the leather strap that secured the guard. Nine are oval; two are rectangular. One guard is rectangular at one end and has two scrolls carved on the other, and four are rectangular on one end and pointed on the other. With the exception of one ivory specimen, all the guards are made of antler.

COMPARISONS: Wrist guards first appear on St. Lawrence Island in the Punuk Stage.[8] The earliest examples of this trait in the Kobuk River Area are from the Intermediate Kotzebue Site which Giddings dates at 1550 A.D.[9] This

[1] Collins, 1937, 148, Pl. 40, Figs. 11–19.
[2] Giddings, 1952, 50–51.
[3] Larsen and Rainey, 1948, Pl. 2, Fig. 15, Pl. 14, Figs. 13–14, Pl. 20, Fig. 24, Pl. 84, Figs. 27–28.
[4] Larsen and Rainey, 1948, Pl. 90, Figs. 1–7, Pl. 94, Figs. 4–5.
[5] Mathiassen, 1927a, Pl. 63, Fig. 3, Pl. 67, Fig. 8, Pl. 74, Figs. 6–10, Pl. 44, 16–19.
[6] Mathiassen, 1930, Pl. 5, Fig. 11.
[7] Murdoch, 1892, Fig. 193.
[8] Collins, 1937, 325.
[9] Giddings, 1952, 51.

artifact is not found in the Thule Culture sites reported by Mathiassen.

Arrowshaft Wrench

Utkiavik: The collections from the Point Barrow Area contain only one fragmentary arrowshaft wrench. This came from Utkiavik, Location X. It is made of antler and has the diamond-shaped hole that is found in most of the instruments of this type.

Comparisons: Arrowshaft wrenches must have been equally scarce when Murdoch made his collection at Barrow, for he does not mention them. This tool seems to have been somewhat more common in the Bering Strait Region; Nelson illustrates 12 from various localities.[1] Giddings records one complete and two fragmentary arrow-straighteners from the Ekseavik Site on the Kobuk River (date, 1400 A.D.).[2] At the Ipiutak Site at Point Hope, four tools that may have been arrowshaft-straighteners were found. The specimen illustrated has a round hole.[3]

This tool does not appear to have occurred early in the Bering Strait Region, nor is it an element of the Thule Culture of Central Canada.

Feather Cutting Board

Accompanying Burial 3 in Structure E, Mound A, Birnirk, was a small rectangular wooden board 0.5 cm. thick, 4 cm. wide, and 17 cm. long. Knife blade scars are on both faces (Fig. 55h). This, possibly, is a feather cutting board used to split feathers when one is fletching arrows.

Comparisons: At the Ekseavik Site on Kobuk River (tree-ring date, 1400 A.D.) Giddings found a similar cutting board which, with just as much certainty as I have, he tentatively identified as having been used for cutting sinew thread.[4] Boards of this type are used by the Iglulik Eskimo for fletching arrows.[5] The same tool is found in recent houses on St. Lawrence Island.[6]

BOLAS BALLS

Murdoch describes and illustrates the bird bolas in use in the 1880's as having six or seven egg-shaped, ivory weights.[7] This weapon was still in common use when the excavations reported here were made. The Birnirk Site is a strategic locality for killing eider ducks during the spring and fall migrations, because they cross the narrow spit at this point as they pass from the shores of the Arctic Ocean to the shore of Elson Lagoon. The modern Eskimo camp here every spring and fall for this purpose. While excavating, my workmen always kept several bolas nearby, and a number of ducks were obtained with this weapon.

Upon close examination there proved to be an unexpected variety of bolas balls from the sites in the Point Barrow vicinity. Rather than attempt to describe the weights from each site, it seems more practical to devise a classificatory system. Through a clerical error not all the bolas balls in the collection are included in this study. However, the total classified is substantial, and there can be little doubt that the results are essentially correct. Some of the forms are found only at Utkiavik; others, at the Late Nunagiak Site and Birnirk; still others, only at Birnirk. For this reason the varieties are described under those headings.

Bolas Ball Classes Found Only at Utkiavik

Class A: Irregular fragments of ivory, but more often of bone, that have been drilled for the attachment of a cord (Fig. 66a–b). Many of these fragments were parts of tools, such as broken tangs of harpoon ice picks. The fragments are fairly small, averaging between 2 and 5 cm. in greatest length.

Class B: Seal astragalus bones perforated so that they may be used as bolas weights (Fig. 66c–d).

Class C: Segments cut from seal ribs or fragments of ivory. These tend to be cylindrical; some are flat. The hole for the string is drilled into the end of the cylinder. Usually, two small holes have been drilled close together and slanted towards each other so that they meet (Fig. 66e–g). These balls range from 2 to 5 cm. in greatest length. Their average weight is about 10 grams.

Class D: Usually segments cut from seal ribs, but a few are made of ivory. These weights

[1] Nelson, 1899, 88–89, Pl. 40.
[2] Giddings, 1952, 47, Pl. 44, Fig. 16.
[3] Larsen and Rainey, 1948, 67, Pl. 42, Fig. 14.
[4] Giddings, 1952, 81, Pl. 33, Fig. 1.
[5] Mathiassen, 1928 (Iglulik Eskimo), 57, Fig. 29.
[6] Geist and Rainey, 1936, Pl. 27, Fig. 7.
[7] Murdoch, 1892, 244–245, Figs. 247–248.

Bolas-Ball Types					A	B	C	D	E	F	G	H	I	J	K	L	M
NUWUK (Purchased)					1	2	1	25	4	4				1			
UTKIAVIK (Purchased)					36	9	26	17	8	48	12						
Over house A						4		8		4							
NUNAGIAK	Md.A	Cut 2		S 4							1						
				S 6						1	2						
	Md.C	Str.D							1								
		Str.E							1								
		Cut 4		S 2			1										
BIRNIRK	Md.A	Cut 4-0-18"										2	1	1	3		
	House A			Roof								1	1	3	1	1	
	House A			Floor								3	1	2	1	2	
	House A	Entrance		floor					4				1				1
		Str.B		Floor									2				
			Below	floor							1		1	3		2	
		Str.C		Floor							1	1		4		2	
			Below	floor					1			5	1	4	5	1	
		Str.D		Floor							1			1			
		Str.E		Floor					2			1	1	3			1
			Below	floor					4			1		5			
		Str.G		Floor										1			
		Str.H		Floor									1	3	1		
		Cut 2		S2									1		1		
				S3											1	1	
				S4					1					1	1		
		Cut 3		S 1										1		1	
				S3										1			
				S 6										1			
	Md.C		House	floor						1			2	4	11	4	6
			Below house	floor					1	2							
	Md.D	Cut 7		S 1												1	
	Md.J	House A		Floor								2	7	7	2	1	
		Cut 1											1				
		Cut 13		S 2									1	2	1		
				S 3									1				
				S 4									1				
	Md.R	House A		Floor										1			
	Md.S	Cut 6		S 1					1								

FIG. 65. Tabulation of the occurrence of bolas ball types.

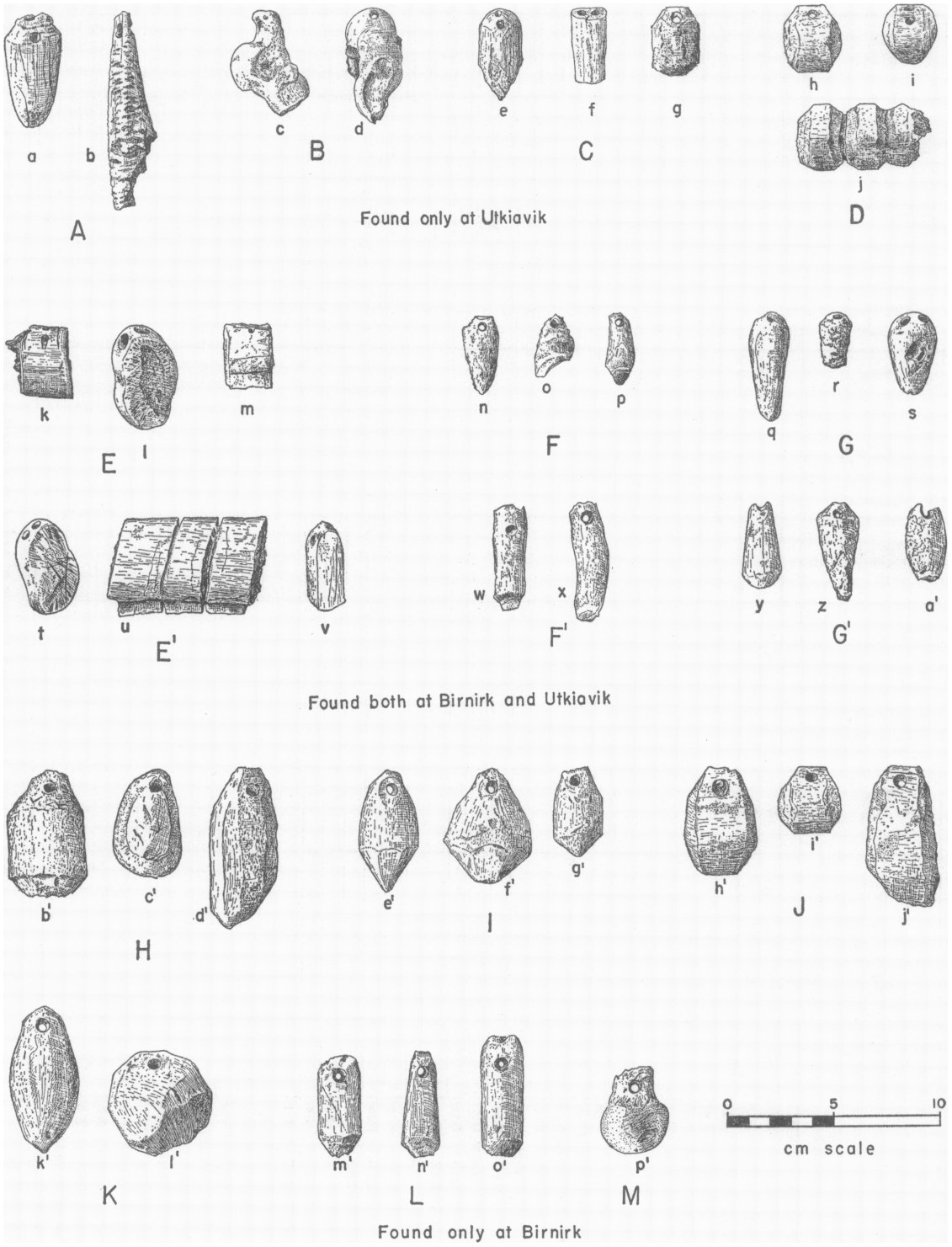


FIG. 66. Bolas ball classes A to M.

differ from those in Class C in that the suspension holes have been drilled into the side rather than the ends of the rough cylinders. As in Class C the two holes in the weights are usually drilled close together, so slanted that they meet to allow the thong to be inserted (Fig. 66h–j). The greatest average diameters range from 2.5 to 3.5 cm. The average weight is about 10 grams.

Bolas Ball Classes Found at Both Utkiavik and Birnirk

Class E: Weights cut from walrus tusk or from ribs. The cut faces of these sections are flat, as though they had been cut with a saw, although close examination shows that a composite knife was used. Generally the weights are only about 1 cm. thick, while the natural oval form of the rib or tusk produces a shape 2 to 3 cm. wide and 3 to 4 cm. long (Fig. 66k–m, t–v). Holes are drilled as shown in the illustration.

Class F: Teeth, usually walrus teeth, that have been drilled to serve as bolas weights (Fig. 66n–p, w–x).

Class G: Teardrop-shaped bolas weights of bone or ivory. These were possibly made to imitate walrus teeth. They are about the same size as those in Class F. In some of this class the suspension hole is in the small end; in others, in the large end (Fig. 66q–s, y–a′).

Bolas Balls That Occur Only at Birnirk

Class H: Crudely finished weights chopped from sections of whale rib. Some are roughly egg-shaped, and all are about the size of a hen egg, from 4 to 6 cm. long (Fig. 66b′–d′). The perforation in one of the tapering ends is drilled straight through, instead of being formed by two drilled holes meeting as was the common practice at the later sites. The average weight is about 44 grams—four times as heavy as the similar, but smaller, weights described in Class C above.

Class I: Egg-shaped sections of whale bone perforated through one of the tapering ends, essentially similar to the preceding category. They differ from Class H in that they are slightly smaller (average range 4.5 to 5 cm. in greatest length) and are more neatly finished (Fig. 66e′–g′).

Class J: Segments cut from rib with the suspension holes drilled through the sides rather than the ends (Fig. 66h′–j′). These resemble Class D. The differences are that these weights are of bone; are three to four times larger than Class D and correspondingly heavier; and the suspension holes are straight and are not formed by two perforations that meet.

Class K: Weights, egg-shaped in outline, and so carved that they are thin, with flat faces on opposite sides. Many appear to have been made from the plate of hard bone inside the lower jaw of the whale. The perforation is in the smaller end. These bolas range from 4 to 6 cm. in length (Fig. 66k′–l′).

Class L: Bone cylinders 5 to 6 cm. long, generally rather crudely finished, with a perforation in one end. Both cylindrical bones of small diameter and cylinders carved from whale bone were used for balls of this type (Fig. 66m′–o′).

Class M: Bolas balls made from the heads of femurs of *Ovis dalli* (Dall's mountain sheep) which are found in the Brooks Range to the south of Barrow and are still hunted near Barter Island where these mountains approach the coast. These are perforated through the broken femoral necks (Fig. 66p′).

The provenience of the bolas balls in the collections is listed in Fig. 65. In the Point Barrow Area, with the passage of time, there was a tendency for these weights to decrease markedly in size. Frequently the drilling of two holes so close together that they connected replaced the Birnirk custom of drilling a hole straight through the ball.

Comparisons: On the Siberian Coast the bolas first appear in the Punuk Period.[1] Bolas corresponding to the classes listed here as F, I, K, and L are illustrated from the Cape Chaplin Site by Rudenko.[2]

The first appearance of this weapon on St. Lawrence Island is also in the Punuk Period.[3] As in Siberia, the weights are nearly always made of ivory and are of the larger size that more nearly corresponds to the assemblage from Birnirk than to that from Utkiavik.

In the Point Hope Area the bolas is recorded only for the modern Eskimo; as is to be expected, it is completely lacking in the Ipiutak finds.[4]

[1] Rudenko, 1947, 109.
[2] Rudenko, 1947, Pl. 13, Figs. 14–15, 18–19.
[3] Collins, 1937, 325, Pl. 76, Figs. 1–19.
[4] Larsen and Rainey, 1948, 28–29.

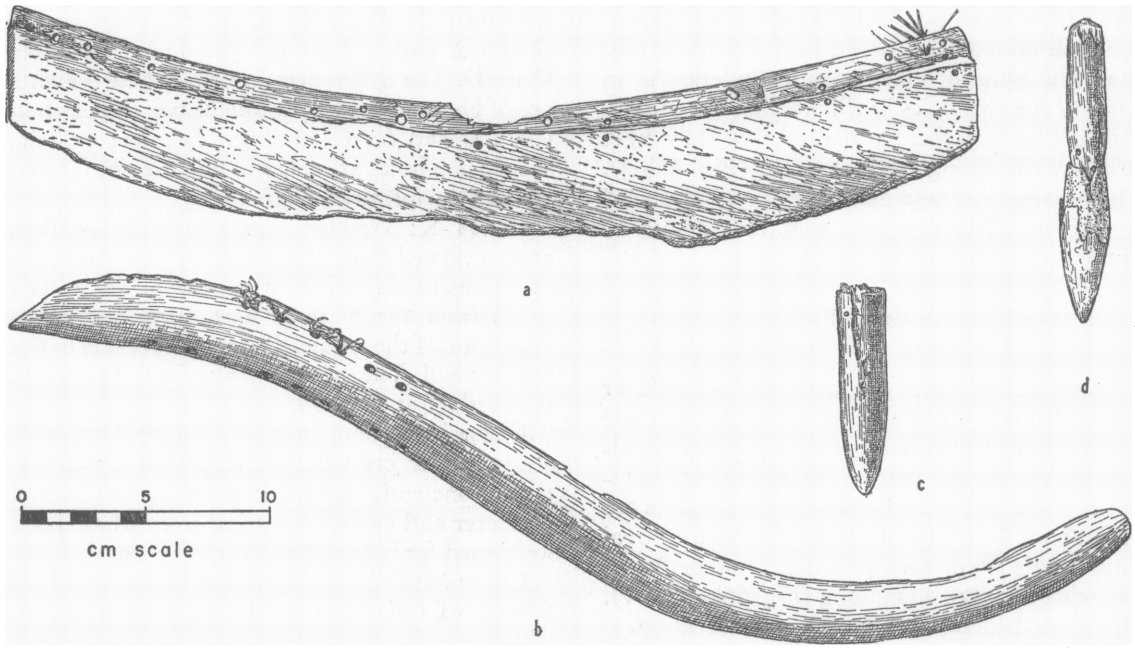


FIG. 67. Snow-handling equipment from Nuwuk and Utkiavik. a. Whale bone edge for wooden shovel. b. Antler snowknife. c–d. Snow probe tips.

Mathiassen lists bolas weights cut from animal ribs as a common element of the Thule Culture and cites their rarity in Greenland and among modern Central Eskimo. Ten of the 12 balls he illustrates from the various Thule sites are clearly of our Class J.[1] The two exceptions appear to be Class I.[2] Obviously the bolas weights from the Thule Culture sites more nearly resemble those found at Birnirk than they do the recent specimens from Utkiavik.

MISCELLANEOUS HUNTING AND TRAVELING GEAR

SNOW PROBE FERRULES

NUWUK-UTKIAVIK: Two ferrules made of antler from the ruins at Nuwuk were purchased. They have sockets to receive wood handles that were secured by bone pins. Four ferrules excavated at Utkiavik were of this same socketed type: one from above the Entrance to House A, one from House B, one from Location X, and one from Section 1, Cut 2 (Fig. 67c–d). In the purchased collection from Utkiavik there are 10 probe ends of the socketed type secured with pins. Nine are made of antler; one is of ivory. In this collection six additional antler probes have bifurcated bases made to receive a wedge-shaped tongue on the handle. These were also secured to the handle with bone pins.

COMPARISONS: Murdoch does not list snow probes as being in use at Barrow during the 1880's, but this was almost certainly an oversight. Their occurrence in refuse associated with iron and glass proves that they continued in use until after contact with Europeans. Nelson illustrates an implement of this class from Point Barrow and identifies it as an "ice staff."[3]

Geist and Rainey illustrate two objects that may be ferrules for snow probes.[4] These were found in the "second house" at Kukulik, a structure which, judging by its contents, was occupied coevally with the early phase of the Utkiavik Site.

The snow probe was an element of the Thule Culture and continues to be widely used among the Canadian Eskimo.[5] In view of the very restricted distribution of this item in Alaska, and the very late date of its appearance there, it

[1] Mathiassen, 1927b, 54; 1927a, Pl. 4, Fig. 11, Pl. 11, Figs. 1–4, 7–8, Pl. 43, Fig. 9, Pl. 68, Fig. 6, Pl. 83, Fig. 5.
[2] Mathiassen, 1927a, Pl. 11, Figs. 5–6.
[3] Nelson, 1899, 214–215, Fig. 68.
[4] Geist and Rainey, 1936, Pl. 44, Figs. 13–14.
[5] Mathiassen, 1927b, 67–68; 1928, 118–120, Fig. 72.

seems certain that this is one of the culture elements that came in from the East.

Snowknives

The two snowknives that Murdoch purchased at Barrow were made of ivory, thin and saber-shaped, the shape dictated by the form of the walrus tusk. The knife he illustrates has a series of holes parallel to one side of the handle, and a thong has been laced through these to provide a secure grip.[1]

Utkiavik-Nuwuk: One snowknife was purchased at Nuwuk. This is a thin piece of antler with an S-curve, 47 cm. long. Holes drilled near both edges of the handle have been laced with baleen to provide a grip as described above (Fig. 67b).

A similar antler knife with an S-curve, 26 cm. long, was excavated from the fill over House A, Utkiavik. There was also in this fill what appears to be a bone handle broken from a Thule type of snowknife virtually identical to a fragment illustrated from Naujan.[2]

In the collection purchased from Utkiavik are four complete snowknives made of antler in the S-curve shape, and fragments of three others.

Comparisons: The snowknife does not seem to be old in Alaska; its presence has not been recorded south of Point Hope. However, it is not beyond the bounds of possibility that some of the tools described as "snow beaters" from the Bering Strait Region may occasionally have been used to cut blocks.[3] It remains for me to agree with Mathiassen, who agrees with Birket-Smith, that snowhouse construction and the attendant tools, snowknives and snow probes, are recent introductions into Alaska from the East.

Most of the snowknives from Point Barrow do not resemble the characteristic shouldered knife of the Thule Culture.[4] They are more similar to the slender knives used by historic Eskimo groups of the Central Region.[5]

Snow Shovels

Murdoch figures two snow shovels from Utkiavik. These have broad wooden blades, short handles, and sharp edges made of strips of ivory. The ivory edges were grooved to receive a tongue along the edge of the wooden blade of the shovel, and the two are fastened together by treenails.

Utkiavik: In the collection purchased from Nuwuk are four edges for snow shovels of this type. These are made of whale bone, rather than ivory, as were the specimens obtained by Murdoch.

Identical bone shovel edges were excavated from the following localities in Utkiavik: House A, one from soil over the house floor, four from over the house entrance, two from the floor of the house; one came from House B (Fig. 67a); one from Section 1, Cut 2, and another from Section 5 of the same cut. The edges of the complete specimens range in length from 18 to 38 cm.

In the purchased collection from Utkiavik are 13 complete and fragmentary blade edges. One fragment is made of ivory; the balance are of bone.

Nunagiak: Two snow shovel blade edges of bone, similar to those described above, were found in recent deposits at Nunagiak: one in House G and the other in Section 1, Cut 6.

In Entrance D, Mound C, a complete shovel made of a walrus scapula was found (Fig. 23). The ridge has been trimmed off the scapula, and four holes had been made for the lashing to hold the handle. The wooden handle, 55 cm. long, has a beveled face that rests against the shovel so that a slight angle is formed by handle and blade. A fragment of another handle came from Section 6, Cut 2.

Birnirk: The snow shovel blade edges found at Birnirk did not have the mortise that characterizes the Utkiavik edges and were made of antler rather than bone. One from the floor of House A, Mound A, was associated with a portion of a wooden shovel (Fig. 68d). A similar thin edge of antler came from the floor of House A, Mound J.

A wooden shovel with a short handle from the floor of House A, Mound A, has no provision for a cutting edge. The blade is 3 cm. thick, and the edge is worn, indicating that this tool had considerable use. An almost identical short-handled shovel that did have a bone blade edge is in the Van Valin Collection from the Point Barrow Area.[6]

[1] Murdoch, 1892, 304–305, Fig. 305.
[2] Mathiassen, 1927a, Pl. 15, Fig. 12.
[3] Geist and Rainey, 1936, Pl. 29, Fig. 4; Nelson, 1899, 77, Fig. 21.
[4] Mathiassen, 1927a, Pl. 15.
[5] For example, the Iglulik; Mathiassen, 1928, Fig. 73.
[6] Mason, 1930, Pl. 1.

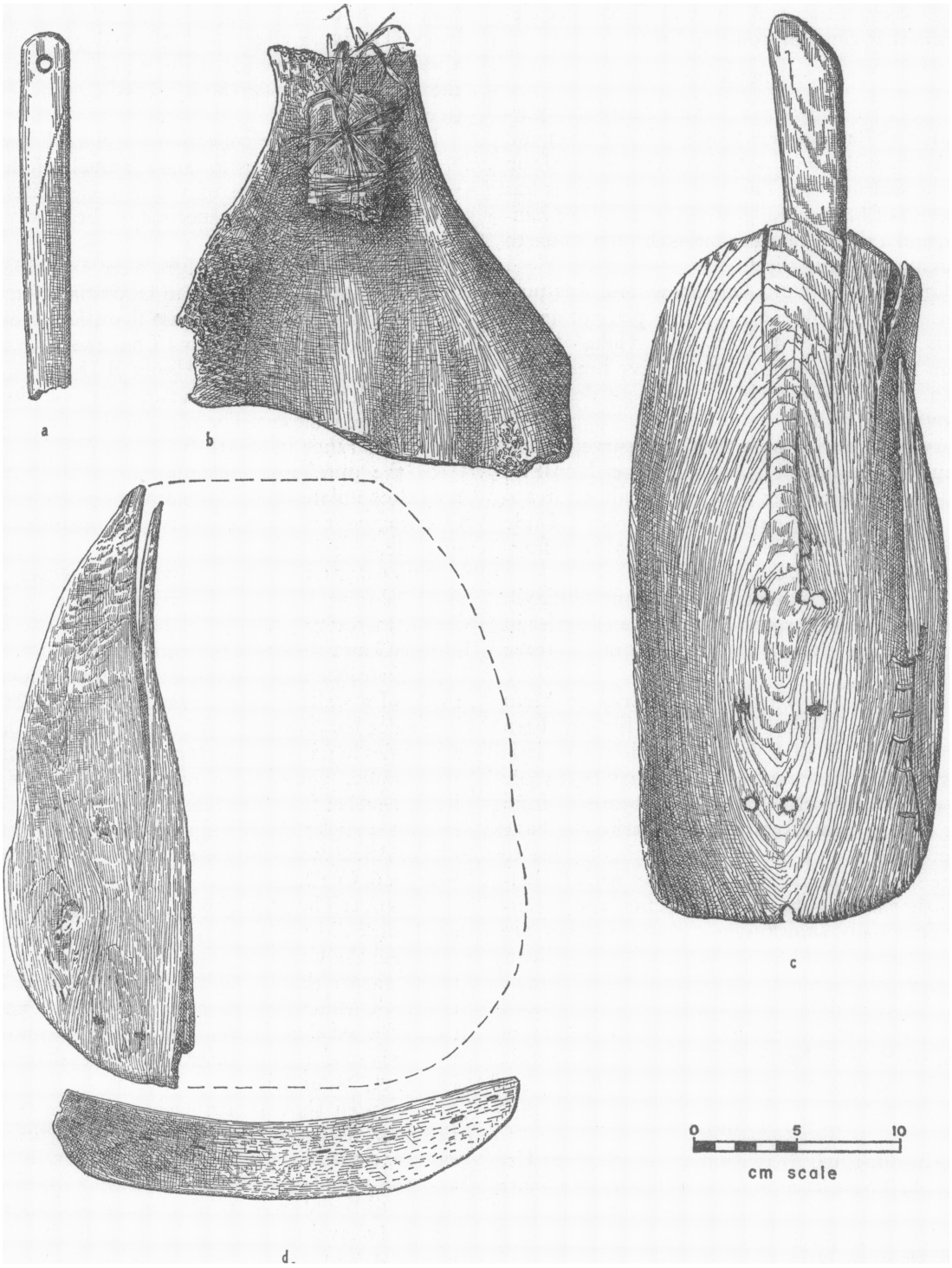


FIG. 68. Snow-handling equipment from Birnirk. a. Possible handle of snowknife. b. Fragment of snow shovel made of scapula. c. One-piece wood snow shovel. d. Wood snow shovel with simple edging made of antler strip.

Two shovels made from scapulae also came from Birnirk. The one illustrated in Fig. 68b is from Cut 2, Section 4, Mound A. The other comes from Cut 3, Section 3, in the same mound. A wooden handle, 56 cm. long, is from the floor of the entrance to House A, Mound A.

COMPARISONS: On St. Lawrence Island the scapula shovel with attached wooden handle dates from Old Bering Sea times[1] and continues through the Punuk Period until historic times.[2] Apparently the wooden shovel with bone edge was never used in this area.

Edged wooden shovels were not found in the Kobuk Region; scapula shovels were fairly common at the Intermediate Kotzebue Site.[3] These items are present, but rare, in Ipiutak.[4] At Point Hope the wooden shovel with bone edge first appears in the Tigara Phase and became common in historic times.[5] This is the type with the inner edge grooved, so common at Utkiavik and Nuwuk.

In the Central Region, scapula shovels are a rather scarce element of the Thule Culture. They have grooves cut to receive the handles and thus are somewhat similar to the Ipiutak type.[6]

Three fragments of edging for wooden shovels were found at Naujan. These are thin flat strips of antler, sharp on one edge, with holes along the opposite edge for the lashing to the shovel. According to Mathiassen, "It is an edging similar to that used by present-day Central Eskimos on snowshovels of wood."[7] The Naujan specimens are almost identical to the snow shovel edgings described from Birnirk. The relative ages of the two types of edging and their distribution make it appear probable that this feature originated in the Point Barrow Area in the Birnirk Period and spread to the Central Region with the Thule Culture. The more complex recent shovel edge is apparently also a local development that never diffused very far from its point of origin.

Ice Staff Rings

Nelson describes a staff used as an aid when walking over thin ice or on the spongy tundra in summer. This has a baleen or antler ring fastened a short distance above the point, similar to the ski poles that are in current use.[8] Murdoch describes the use of staffs by the aged at Barrow and publishes a drawing of an old Eskimo holding two staffs with ferrules on the ends. He does not mention the use of the attached rings.[9]

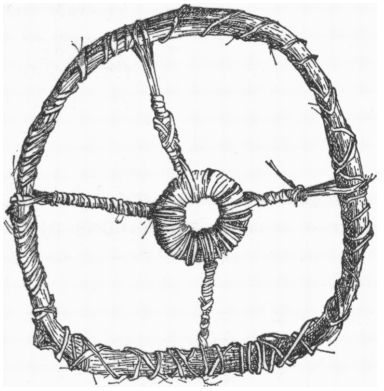


FIG. 69. Baleen ring for walking stick from Birnirk. This functions exactly as does the ring on a modern ski pole.

UTKIAVIK: A baleen ring, 10 cm. in diameter, for the walking staff was found above House A. The hole in the central ring is rather small, which suggests that the staff on which it was used possibly had an iron point. Both outer and inner rings are formed of a coil of baleen strips that have been wrapped with similar strips. Four spoke-like lashings connect the inner and outer rings.

BIRNIRK: Three baleen rings were found at Birnirk. Two wrapped rings, each 9 cm. in diameter, that lack the center ring and spoke-like lashings came from Mound A: one from beneath the floor of Structure B, the other from Section 5, Cut 2. The third complete ring, 10 cm. in diameter, also from Mound A, came from the floor of Structure D (Fig. 69).

COMPARISONS: From the Sirhenik Site on the Siberian Coast, Rudenko illustrates a baleen ring of the type described. It has eight lashings connecting inner and outer rings; an extra lashing fills the space between the two rings.[10] This site ranges from Old Bering Sea to Punuk times.

[1] Collins, 1937, 161–162, Pl. 50, Fig. 6.
[2] Geist and Rainey, 1936, 105, Pl. 24, Fig. 7.
[3] Giddings, 1952, 79.
[4] Larsen and Rainey, 1948, 87.
[5] Larsen and Rainey, 1948, 176, Pl. 89, Fig. 26.
[6] Mathiassen, 1927b, 67.
[7] Mathiassen, 1927a, 48, Pl. 16, Fig. 6.
[8] Nelson, 1899, 214–215, Fig. 67.
[9] Murdoch, 1892, 352, Fig. 355.
[10] Rudenko, 1947, Pl. 23, Fig. 19.

Although these ski-pole-like walking staffs seem to be confined to the western part of the Eskimo Area, they range in time from modern at least to the Early Punuk-Birnirk time period.

Snow Goggles

The snow goggles collected by Murdoch at Point Barrow were usually made of wood, although he illustrates one pair made of antler and mentions a pair made in two pieces connected across the nose by strings of beads.[1]

Utkiavik: The collection from Utkiavik includes three fragments of goggles. The broken half of a wooden goggle made in one piece was in the fill above the floor of House A. From the same locality there was also half of a wooden snow goggle that had been tied together over the nose. A half of a baleen snow goggle in the purchased collection from Utkiavik was also tied together over the nose.

Nunagiak: Three snow goggles also came from the Nunagiak Site. Two single-piece goggles made of ivory were found in the Punuk Period house below Mound C on the beach of the lagoon (Fig. 21i). These beautiful goggles bear Punuk Period decorations and were probably brought to the Point Barrow Area from the south along with the other items found in this structure. The third goggle, also of ivory and nicely decorated, was purchased from an Eskimo who had dug at Nunagiak a few weeks previous to my arrival (Fig. 21n). It probably also came from this same structure.

Birnirk: Four snow goggles were found at Birnirk. One made of ivory, from the floor of the house in Mound C, was very similar in shape to the ivory goggles from Nunagiak, but undecorated (Fig. 70a). The second similarly shaped one-piece goggle was made of wood. This came from the floor of House A, Mound A (Fig. 70b).

A complete two-piece goggle made of bark was found on the floor of Structure E, Mound A (Fig. 70c). A fragment of half of a similar goggle made of wood came from the floor of the house in Mound R. Cut slots in the edges of the goggles provide the means for attachment.

Comparisons: Rudenko illustrates single-piece ivory goggles from the Uwelen Site, Uwelen-Okvik Stage.[2] Except for the decoration these goggles are directly comparable to one-piece goggles from Birnirk and Nunagiak. Similar but undecorated goggles are illustrated from the Plover Bay Site.[3]

Goggles from the Okvik Site on Punuk Island differ from those described in having small round eye holes rather than the usual horizontal slits.

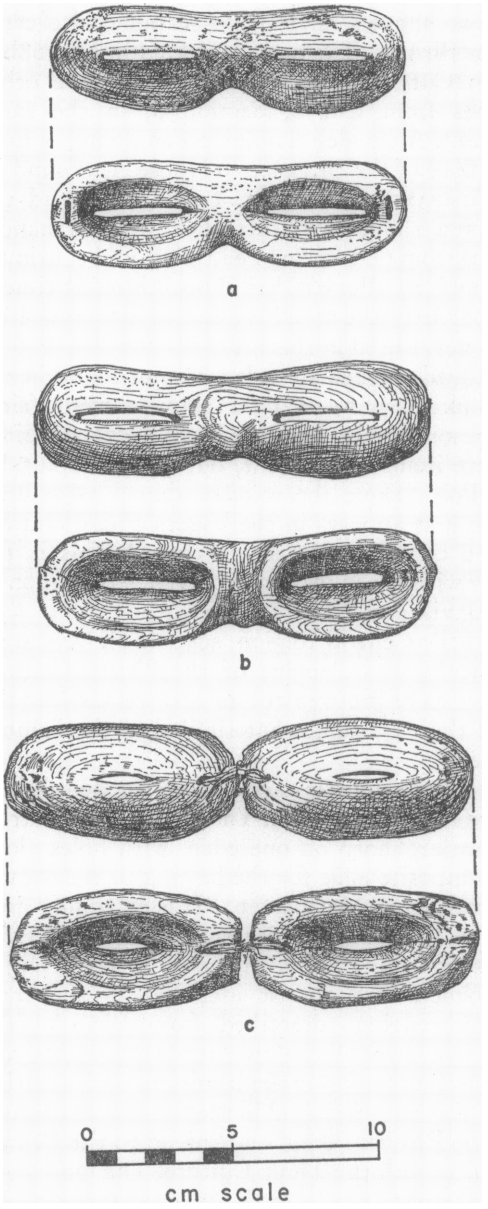


Fig. 70. Snow goggles from Birnirk.
a. Ivory. b–c. Wood.

[1] Murdoch, 1892, 261–262, Figs. 259–261.
[2] Rudenko, 1947, Pl. 2, Fig. 14.
[3] Rudenko, 1947, Pl. 18, Fig. 18.

Three single-piece snow goggles, made of wood and very similar in shape to the Birnirk specimens, were found in the Old Bering Sea Period deposits at Miyowagh on St. Lawrence Island.[1] A similar fragment of a decorated ivory goggle had Early Punuk decoration.[2]

One single-piece goggle made of antler came from the Ekseavik Site on Kobuk River, dated by Giddings as about 1400 A.D.[3]

At Point Hope four snow goggles were found in the Ipiutak Site. One of these had round eye holes as in the Okvik specimen. Larsen and Rainey believe that this is possibly an intrusive element in the Ipiutak Complex.[4] In the Tigara burials, which yielded Birnirk and Western Thule types, an ivory snow goggle was found which is very similar in shape and decoration to that shown in Fig. 21i.[5]

In the Central Region at Naujan and Kuk, bone goggles were found.[6] In all essentials these crude goggles resemble the single-piece specimens from Birnirk. The single-piece snow goggle appears to be an old and widely distributed Eskimo type. The two-piece goggle found at Birnirk and in the Utkiavik midden seems to be a local development with a limited diffusion.

[1] Collins, 1937, 178, Pl. 58, Figs. 1–2.
[2] Collins, 1937, 180, Pl. 60, Fig. 6.
[3] Giddings, 1952, 56, Pl. 33, Fig. 16.
[4] Larsen and Rainey, 1948, 113.
[5] Larsen and Rainey, 1948, 177, Pl. 92, Fig. 1.
[6] Mathiassen, 1927b, 112–113; 1927a, Pl. 29, Fig. 3; Pl. 70, Fig. 9.

FISHING EQUIPMENT

LEISTERS AND SALMON SPEARS

Murdoch does not mention the multipointed fish spear at Barrow. The salmon spear apparently was little used; he collected only one specimen, which had been made for sale.[7] Fish spears with multiple points and fish arrows similar to those described below from Birnirk were recorded from Nunavak Island by Nelson.[8] Salmon spears were also in common use in the Norton Sound, Yukon, and Kuskokwim Delta areas.

UTKIAVIK: The parts for multipointed fish spears were not abundant in the Utkiavik ruins. Two points were found in the fill over House A (Fig. 71a), and one came from Cut 2, Section 2. These were made of antler. An ivory point was found on the floor of House B (Fig. 71b). Eight points were in the collection bought from Eskimo diggers.

Salmon spear parts were somewhat more common. Short, wide, thin barbs of antler, 4 to 6 cm. long, are provided with a step against which the prong rested (Fig. 71c). Most of these have drilled holes for lashing to the prong, but one has a slot. A prong of a salmon spear with the barb inserted through a hole is included in the Utkiavik purchased collection (Fig. 71g).

Salmon spear center prongs are rather difficult to identify with certainty. In the collections are some bone and ivory rods with rounded ends that have been placed in this category.

Provenience of Salmon Spear Parts	Barbs	Center Points
Purchased collection, Utkiavik	10	6
Over House A	3	2
Floor of House A	—	1
Cut 2, Section 1	1	—

NUNAGIAK: Only two points for fish spears were recovered at Nunagiak. One came from Cache B, Mound C; the other, from Cut 4, Section 4 (Fig. 72a–b).

Only salmon spear barbs were found at Nunagiak. One came from each of the following localities: Cut 1, Structure G; Entrance D, Mound C; Cut 2, Section 5; and Cut 2, Section 6. One simple bone point that may be a leister center point came from Mound C.

BIRNIRK: No identifiable salmon spear parts were found at Birnirk. What are sometimes called "simple bone points," small bone rods pointed at both ends, were found at the following localities: one in House A, Mound A; three in Structure C. In Mound J there was one each in Cut 13, Section 2, Section 3, and on the floor of House A. However, without additional evidence these cannot be accepted as center points for salmon spears. Their use as fish spears is more likely.

Fish spearpoints are a part of the Birnirk artifact complex. Three delicate barbed points

[7] Murdoch, 1892, 286–287, Fig. 278.
[8] Nelson, 1899, 194, Pl. 67, Figs. 1–2.

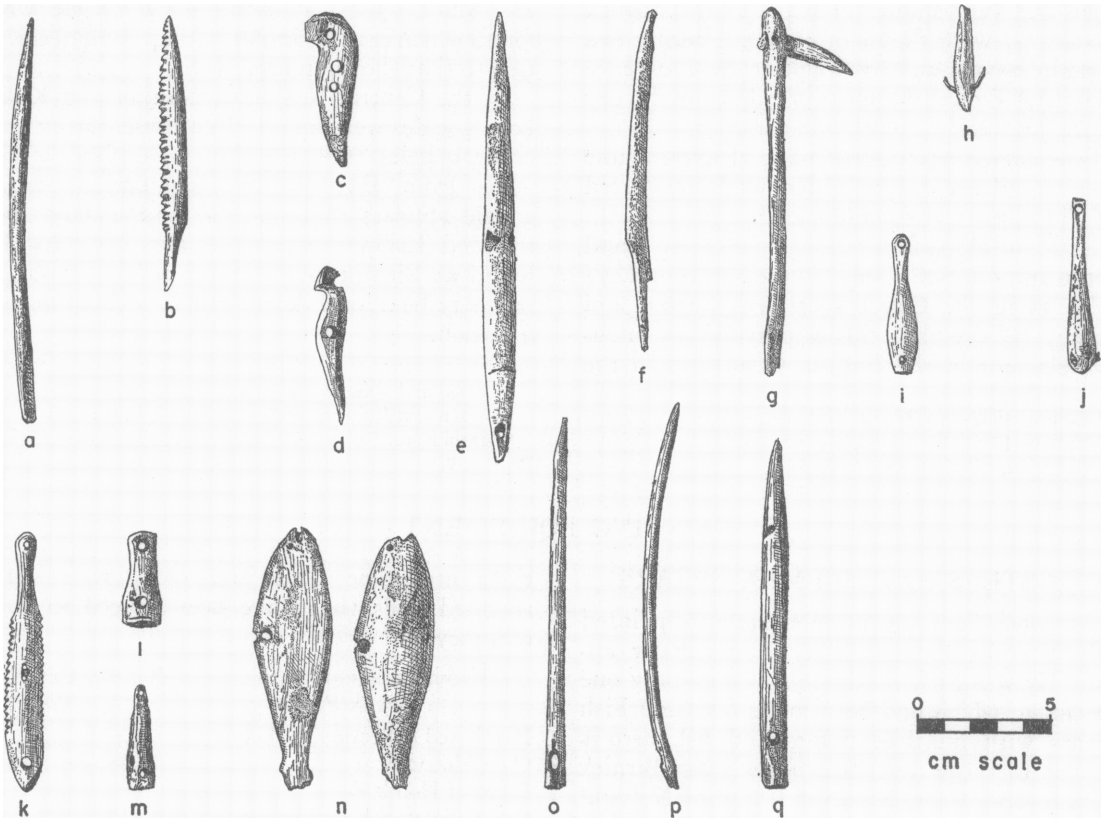


FIG. 71. Fishing gear from Nuwuk and Utkiavik. a–b. Points for fish spear. c–d. Barbs for salmon spear. e–f. Prongs for salmon spear. g. Prong for salmon spear with pin type of barb. h–j. Jigging hooks for tomcod. k. Burbot hook shank used with a steel hook. l–m. Jigging hooks for tomcod that had a bead or bright stone fastened on the bottom. n. Fish lure of bone, made in two pieces. o–q. Bone needles for stringing fish.

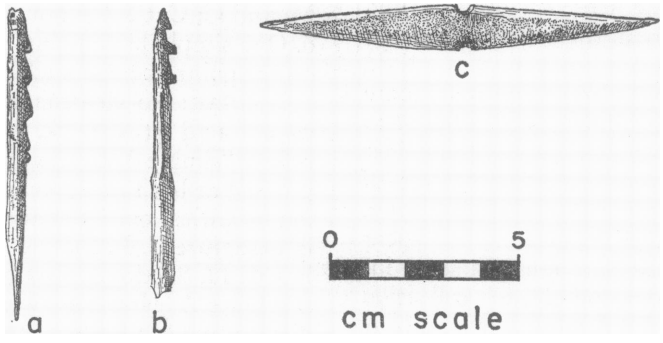


FIG. 72. Fishing gear from Nunagiak. a–b. Points for multipointed fish spear. c. Gorge.

made of antler attached to a fragment of a wooden shaft were found lying on the floor of the house in Mound C (Fig. 73a). It is impossible to decide whether this was a light spear or an arrow. A set of four similar points, three barbed on one side and one barbed on both sides, was found in Mound A, below the floor of Structure B (Fig. 73b). Single points of this class came from Structure E, Mound A; the floor of the house in Mound J (Fig. 73c); Cut 2, Section 4; and Cut 3, Section 4.

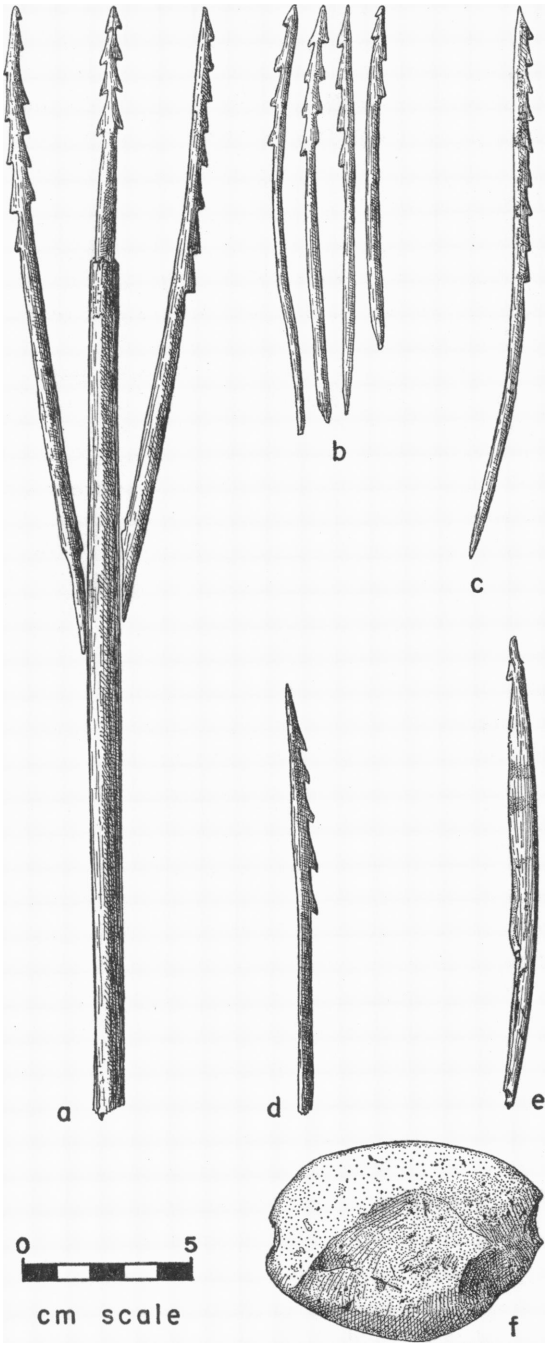


FIG. 73. Fishing gear from Birnirk. a–e. Parts of multipointed fish spears. f. Notched pebble that may be a sinker.

COMPARISONS: Rudenko found salmon spear barbs with lashing slots at the Uwelen Site,[1] and Rainey shows similar barbs from the Okvik Site.[2] They were not found in the series of sites near Gambell on St. Lawrence Island and were scarce at other Punuk Period sites on the island, possibly owing to the rarity of streams large enough for big fish.[3] Slotted barbs were found at the Ipiutak Site.[4] On the Kobuk River this same form, with drilled lashing holes rather than a slot, came from the Intermediate Kotzebue Site[5] which dates about 1400 A.D. After this time a simpler pin-shaped barb, roughened but not perforated to retain a lashing, replaced the older form.

When the age of salmon spears is considered, it seems remarkable that evidence of the weapon is absent at Birnirk. If the Birnirk people made journeys inland for deer hunting, as do the historic Eskimo, such spears would have been useful on the large streams.

Salmon spears are a prominent element of the Thule Culture of the Central Arctic. The barbs have drilled holes for lashing, rather than slots, and thus resemble specimens from Utkiavik.[6] The pin-shaped barbs inserted through a hole in the side prongs are also known from Naujan and Kuk. This is the historic type collected by Murdoch at Barrow (see Fig. 71g). It seems probable that the pin-shaped barb, introduced on the Kobuk River after 1400 A.D., was used in this fashion.

Apparently in the Point Barrow Area the salmon spear was introduced at a rather late date when drilled lashing holes for the barbs had replaced slots. Possibly this influence stemmed from the Thule Culture of the Central Arctic. The pin-shaped barbs, introduced in the Kobuk Region about 1400 A.D., seem to have been much later in reaching the region of Point Barrow, for the few specimens found are

[1] Rudenko, 1947, Pl. 2, Figs. 20–21.
[2] Rainey, 1941, Fig. 15, Items 1–3.
[3] Collins, 1937, 225.
[4] Larsen and Rainey, 1948, Pl. 7, Figs. 17–24.
[5] Giddings, 1952, 36, Pl. 36, Fig. 16.
[6] Mathiassen, 1927b, 55–56.

historic; they either are in deposits containing trade goods or are made of iron.

Light fish spears, or perhaps fish arrows, are an old Eskimo cultural element that changed little with time. They were found at the Okvik Site on St. Lawrence Island,[1] at the Old Bering Sea Period deposits at Miyowagh,[2] and in all periods represented on the Kobuk River.[3] They are possibly also present in the Ipiutak Culture at Point Hope.[4] Fish spearpoints are also an element of the Thule Culture of the Canadian Arctic.[5]

GULL HOOKS OR GORGES

Strangely enough the present collection contains only one specimen that can be identified as a gull hook, a widespread Eskimo device that extends back in time at least to the Ipiutak Culture. This hook came from Cut 2, Section 6, at Nunagiak (Fig. 72c).

FISHHOOKS

UTKIAVIK-NUWUK: Fishhooks, found only at the recent sites of Utkiavik and Nuwuk, seem to have been made following contact with Europeans, for copper and iron barbs are commonly used with them. With one exception the same types were collected by Murdoch in the 1880's. A small hook with a teardrop-shaped ivory shank flattened on one side, with a projecting copper hook, was found in House B, Utiavik (Fig. 71h). This is identical with hooks figured by Murdoch for catching small fish.[6]

Hooks for jigging tomcod are exactly similar to those illustrated by Murdoch.[7] Eight were in the Nuwuk purchased collection and four in the similar material from Utkiavik (Fig. 71i–j). The shank of a hook from Utkiavik that was used for burbot fishing (Fig. 71k) is identical to one illustrated by Murdoch.[8]

Another type of hook, not mentioned by Murdoch, is common in contact period refuse. This has an ivory shank that is cupped on the base to accommodate a small stone, or perhaps a glass bead, which served as a lure. Small holes are provided for lashing the lure on, as well as holes for barbs (Fig. 71 l–m). One of these hooks came from the floor of House A, Utkiavik, one was in the Utkiavik purchased collection, and three were purchased from Nuwuk. Nelson describes hooks of this type from the Bering Strait Region.[9]

Fish lures, small fish effigies carved of bone or antler, are illustrated by Nelson,[10] but Murdoch fails to mention them. However, they were evidently in use in the Point Barrow Area. One was in the collection purchased from Nuwuk; another, made in two parts, was in the Utkiavik purchased collection (Fig. 71n); and a fragmentary effigy came from Cut 2, Section 1, Utkiavik.

Bone or ivory bodkins, perhaps used for stringing fish, are shown in Fig. 71o–q. This could hardly be the sole use of these tools, for they are rather numerous in comparison to other fishing gear. The points of some are wedge shaped, and these may be boot sole creasers or marlinspikes for the bow. The workmanship of bodkins ranges from rather nicely finished to crude. Their length ranges from 4 to 9 cm. In the collection purchased from Nuwuk are five; 28 were purchased from Utkiavik. At Utkiavik one well-shaped bodkin came from the floor of House B, one from Cut 2, Section 1, and one from Section 5 of the same cut.

COMPARISONS: The early inhabitants of the Point Barrow Area seem to have been little interested in fishing, for the Birnirk people did not use the composite fishhook which they might have acquired from contemporary and earlier cultures of the Bering Strait Region. The recent curved shank fishhook of the Point Barrow Area resembles the hooks found at Ekseavik on the Kobuk River (date 1400 A.D.).[11] Giddings is probably correct in saying that this recent northwest Alaska form came from the interior.

Fish lures do not seem to be an old element of Eskimo culture. They were used on the Kobuk River in 1400 A.D.[12] and are found at Canadian Thule sites.[13]

[1] Rainey, 1941, Fig. 13, Items 14–15.
[2] Collins, 1937, 133, Pl. 33, Figs. 16–22.
[3] Giddings, 1952, 41.
[4] Larsen and Rainey, 1948, 78.
[5] Mathiassen, 1927b, 56–57.
[6] Murdoch, 1892, Fig. 266.
[7] Murdoch, 1892, Fig. 274.
[8] Murdoch, 1892, Fig. 271.
[9] Nelson, 1899, 178.
[10] Nelson, 1899, Pl. 68, Fig. 6.
[11] Giddings, 1952, 40, Pl. 29, Figs. 3–10.
[12] Giddings, 1952, 40.
[13] Mathiassen, 1927a, 42, Pl. 11, Figs. 9–12.

TRANSPORTATION

BALEEN TOBOGGANS

When Murdoch was at Barrow, the toboggan made of strips of baleen was no longer in use, owing, no doubt, as he says, to the commercial value of the material. However, Murdoch did examine a 10-foot-long toboggan of this type and secured a small specimen which he illustrates.[1]

UTKIAVIK: A fragment of a baleen toboggan was found on the floor of House A at Utkiavik. This consisted of four short sections of baleen fastened side by side with baleen lashings.

NUNAGIAK: A few fragments of a baleen toboggan came from Entrance D beneath Mound C at Nunagiak.

BIRNIRK: Baleen toboggan fragments were more common at Birnirk than at the later sites. They were found in Mound A on the floor of the entrance to House A and in Structure E; in Mound J, Cut 13, Section 3; and on the floor of House A, Mound R. A complete small toboggan was in Mound D, Cut 7, Section 5 (Fig. 74). The strips of baleen are held by three cross strips that pass through slits. A toy toboggan, 31 cm. long, found in Mound A, Cut 3, Section 6, was made in the same fashion.

COMPARISONS: Baleen toboggans found at Okvik and Old Bering Sea Period sites on St. Lawrence Island differ from the Birnirk examples in that the cross pieces are fastened to the baleen strips by a lashing that passes through round perforations.[2] Similarly constructed toboggans were recently in use on St. Lawrence Island.[3]

Toboggans of baleen are a not very common element of the Thule Culture. Cross strips with lashing holes that connected halfway through the runner strips were found at Naujan.[4]

SLEDS

Murdoch describes two varieties of sleds in use at Point Barrow. On the railed sled the wide wooden runners were connected by wooden arches. Vertical stanchions were fastened to the runners and the slats that form the floor of the sled, both by rails lashed along the stanchions and by the arches that connect the runners. Rails lashed along the tops of the stanchions formed sides for the bed of the sled. At present this type of sled has largely been superseded by the Nome type of basket sled.

Flat sleds were and still are made by the fastening of cross boards directly on the tops of wooden runners, 8 to 10 inches high. In Murdoch's time strips of bone cut from the jaw of the whale were used as shoes; in the 1930's iron wagon tires were used, but these probably are no longer easily obtainable.

A small hand sled constructed on the same model as the flat sled was also in use and was pulled either by one or two dogs or by humans.[5]

UTKIAVIK: Sled shoes made from the hard flat bone that forms the inside of the lower jaw of the whale are common in the recent middens. These shoes, from 1 to 2 inches wide, were attached to the wood runners by bone treenails inserted through drilled holes. Most of the runners are worn so thin that they are no longer usable (Fig. 75a).

Bone sled shoes were obtained from the following localities:

Above House A	13
Above entrance of House A	16
Floor of House A	2
House B	2
Cut 2, Section 3	1
Cut 2, Section 6	1
Cut 4, Section 2	1

Sled shoe fragments are so common at these sites that the Eskimo who made the collections that I purchased from Utkiavik and Nuwuk did not include these items in the lots offered for sale. Therefore, the number of specimens included in the purchased collections need not be cited.

A sled shoe made of baleen, but otherwise identical to the bone shoes, came from the fill above House A in Utkiavik.

The ivory runner of a toy flat sled, 13 cm. long, was found at Location X, Utkiavik.

Dog gear fittings were not abundant in the recent sites. A broken swivel was in the purchased collection, and a complete swivel came from the floor of House B (Fig. 75b). Another fragmentary specimen was purchased from

[1] Murdoch, 1892, 356–357, Fig. 359.
[2] Rainey, 1941, 500; Collins, 1937, 158.
[3] Geist and Rainey, 1936, 128.
[4] Mathiassen, 1927a, 45.
[5] Murdoch, 1892, 353–357.

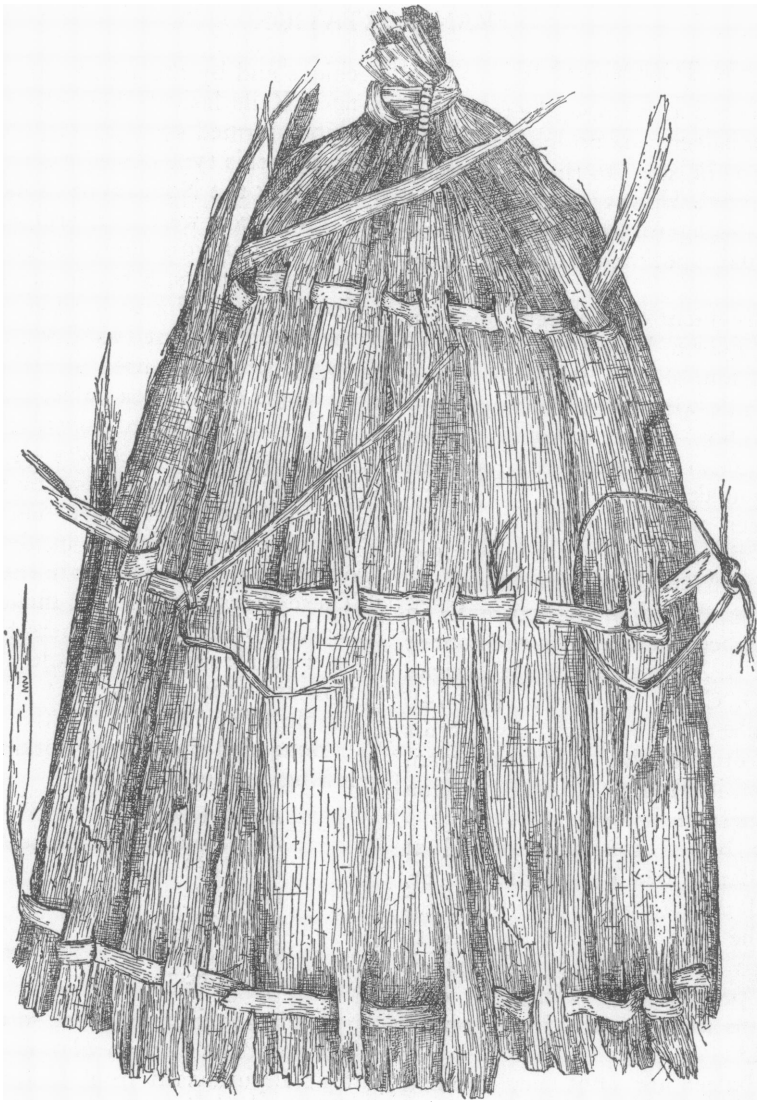


FIG. 74. Baleen toboggan from Birnirk.

Nuwuk. What may be the handle of a dog whip came from the floor of Mound A (Fig. 75c).

NUNAGIAK: Bone sled shoes, similar to those described above, were found in recent midden deposits at Nunagiak. They came from the following localities:

Cut 1, Section 1	1
Cut 2, Section 2	2
Cut 4, Section 3	1
Mound C, upper part of deposit	1

Pieces of antler that form a curve approaching 90 degrees are arches for an earlier version of the railed sled. Holes are drilled near each end of these sections of antler for a lashing to secure the arch to the runners. Two slots are cut near the top of the arch for the lashing of the cross piece (Fig. 76a). Two of these arches came from Mound C: one from the soil of the mound, and one from Entrance D below the mound on the level of the lagoon beach.

BIRNIRK: No sled shoes were found at Birnirk, nor were there any buckles or toggles that might have been parts of dog harness. Yet evidence of the arched built-up sled is found (Fig. 77c) in the form of broken antler arches similar

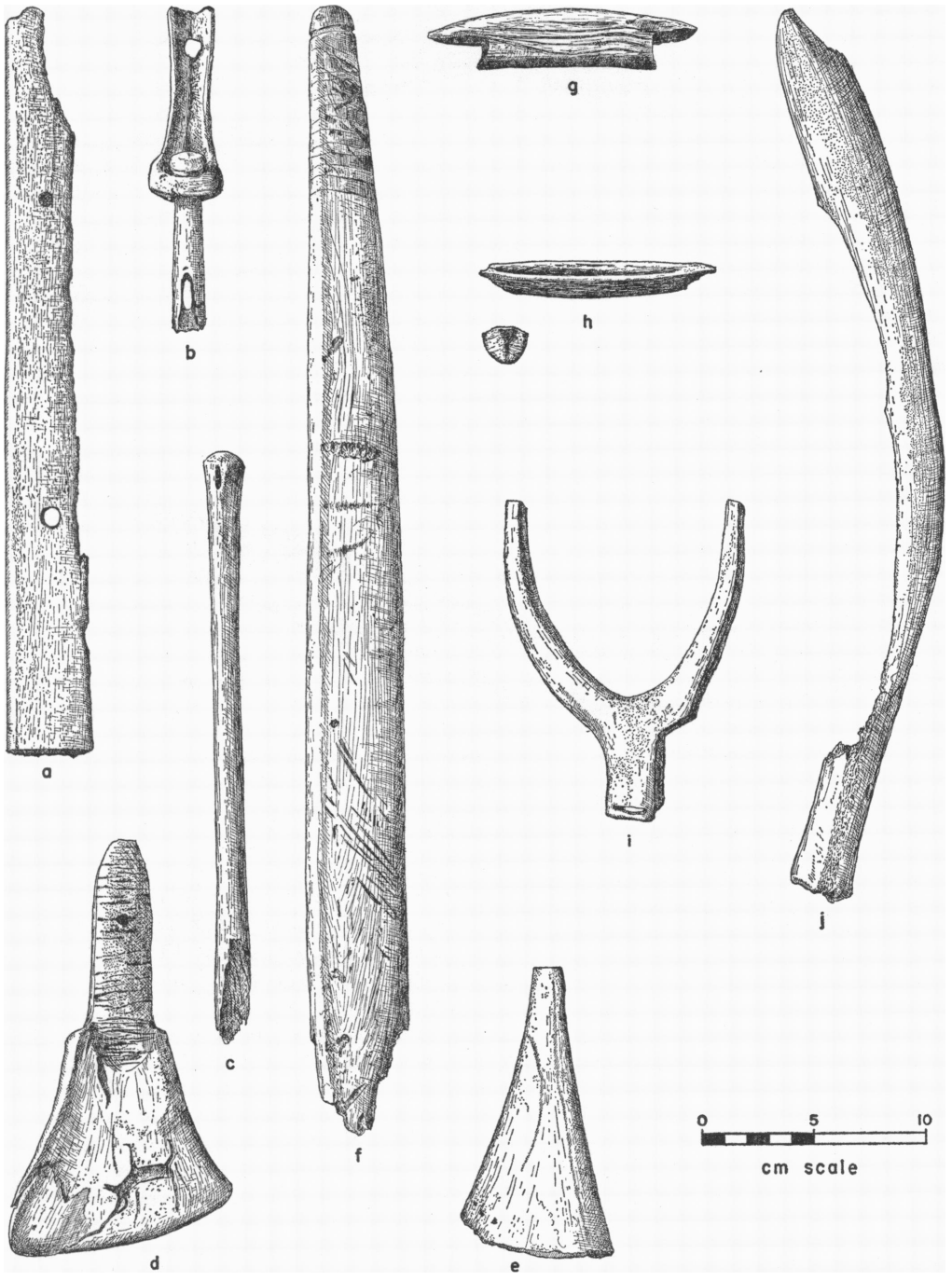


FIG. 75. Sled and boat parts from Utkiavik and Nuwuk. a. Whale bone sled shoe. b. Swivel for dog line. c. Handle for dog whip. d–e. Antler scrapers for removing ice from boat when it is taken from water. f–g. Parts of kayak frames. h. Toy model of umiak, made of bark. i. Crotch for holding harpoon in umiak. j. Antler bailer for kayak.

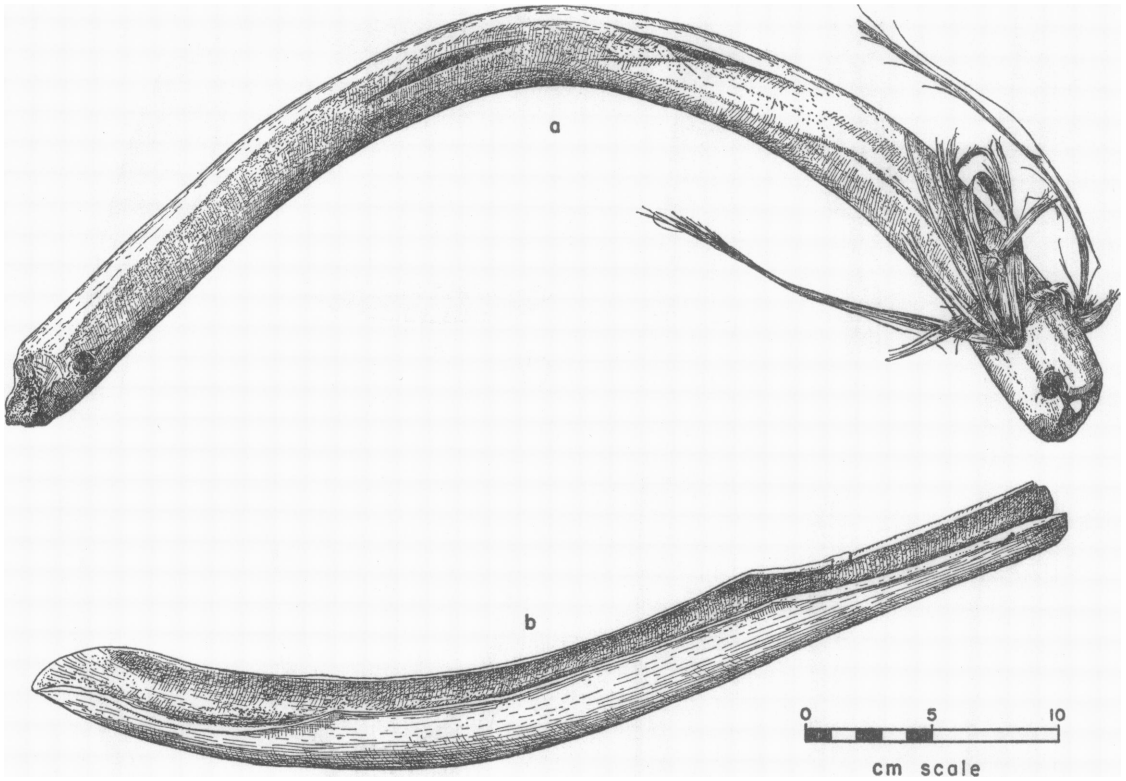


FIG. 76. Sled and boat parts from Nunagiak. a. Antler arch for built-up sled. b. Antler bailer for kayak.

to those described above. These broken arches came from the following localities:

Mound A, Cut 3, Section 7	2
Mound A, floor of House A	2
Mound A, Structure C	1
Mound C, floor of House A	1
Mound J, Floor No. 1 of House A	1

In addition, a matched pair of strongly curved wooden pieces, oval in section, scarfed and perforated at the ends for lashing, were found on the floor and in the entrance to House A, Mound A (Fig. 77d). These seem to be bow pieces for the type of sled described by Nelson from Plover Bay, Siberia. This sled also has antler arches in contrast to the wooden arches used in the Alaskan built-up sled.[1]

A wooden toy sled was obtained from the floor of House A, Mound A. It apparently represents the flat sled type; judging from its proportions, it was a rather long sled (Fig. 77e). This is the *komotin* type of sled. The runners are 22.5 cm. long. Small holes for baleen lashing along runner tops retain fragments of baleen. The crosspieces are missing, but the thin rail that was fastened above the floor boards over the top of one of the runners is preserved. Deep grooves in the bottom of each runner at the bow of the sled perhaps served to receive the curved bow pieces that would aid the sled in riding over snowdrifts.

Two boards found may be floor slats for sleds. One, 2 cm. thick, 6 cm. wide. and 32 cm. long, came from Structure C, Mound A. A hole in each end was apparently intended for the lashing. The second board, of similar cross-section, 29 cm. long, also has lashing holes near the ends. It comes from above the floor of the house in Mound R.

A third type of sled from Birnirk, floor of Structure G, Mound A, is made of whale rib. A flattened segment of rib, 8 cm. wide, 37 cm. long, it is broken at one end and shows considerable wear on the running surface. A large hole at the unbroken end is provided for lashing. The other segment, 47 cm. long, is also badly worn from use (Fig. 77a). Six lashing

[1] Nelson, 1899, 208, Fig. 62.

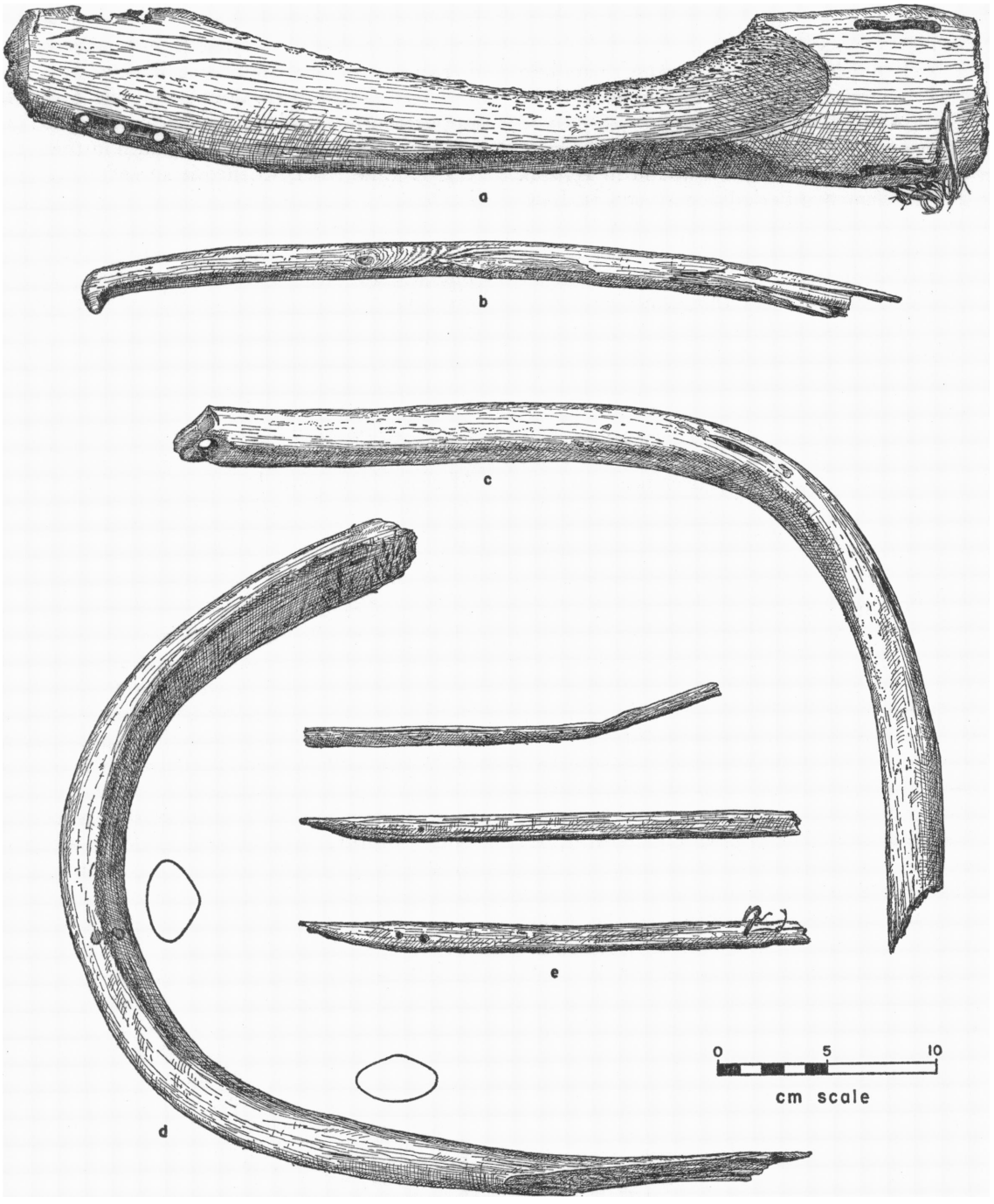


FIG. 77. Sled parts and equipment from Birnirk. a. Whale rib runner for small hand sled. b. Handle for dog whip. c. Antler arch for built-up sled. d. Bow piece for built-up sled. e. Runners and stringer to fit over floor boards of flat *komotin* type of sled.

holes are provided at each end; some of the baleen lashing is still attached.

A nicely finished wooden rod, which may be a dog whip handle, was found on the floor of the house in Mound J (Fig. 77b).

COMPARISONS: Simple low sleds of the general type last described were found in Ipiutak and Old Bering Sea Period deposits on St. Lawrence Island. The most common kind are of walrus tusk, but some are of whale rib as are those at Birnirk.[1]

The low, short sled of this same basic type was subjected to some refinement during the Punuk Period and may have remained the only type in use on St. Lawrence Island until recent times. Geist found a wooden arch at a historic house in the Kukulik Midden.[2] Ivory and bone arches were found at the Okvik Site, but these are rather low and may have been used as crosspieces on the short sled of walrus tusk, the runners of which were also present.[3]

In the course of his excavations at the Kavran Site in Kamchatka, Jochelson found a bone sled arch quite similar to the antler specimens from Birnirk.[4] As the same deposit also yielded asymmetrical, leaf-shaped blades nicely chipped, as well as microlithic cores, this deposit may be rather old.

On the Kobuk River, Giddings found that sled shoes essentially of the modern type first appeared at the Intermediate Kotzebue Site (1550 A.D.), but positive evidence of dog traction such as swivels, and possibly dog whip ferrules, does not appear until the time of the Ambler Island Site (1730–1760 A.D.).[5]

Dog traction was an element of the Thule Culture.[6] Sled shoes were very comparable to the Western form, made of whale bone or baleen and pegged to the wooden runners. Dog trace buckles are fairly common. Mathiassen tentatively identifies a few items as whip handles. These are long and thin like the Alaskan whip rather than short and thick like the Greenland form.

The origin of dog driving has been in some doubt. Was it invented in the Central Region during the eastward spread of the Thule Culture or did the trait diffuse from Siberia where it might have been derived from reindeer driving and ultimately from horse driving?

There can be little doubt that the dog gear appurtenances which have been accepted as evidence for this trait did originate in the Central Eskimo Area, whence it spread to Alaska in the backwash of Thule elements which Giddings' dendrochronological studies would place in the eighteenth century. However, trace buckles, swivels, and bone sled shoes are not essential for driving dogs. There is evidence that both the flat sled and the Siberian Chukchi type of sled, with antler arches and curved wooden bow pieces, were both known to the Birnirk people. The less confident identification of a dog whip handle also may be evidence that the trait may have diffused from Siberia. After all, it seems to be more probable that dog driving would have been well established before the development of specialized equipment.

Among the Inland Chukchi in eastern Siberia the built-up sled with bone or antler arches and recurved bows is drawn by reindeer, while among the coastal people of this same group and the Yuit Eskimo it is drawn by dogs. It seems very probable that this form of sled and dog traction was diffused into Alaska in Birnirk times. The wooden arched dog sleds described and illustrated by Murdoch and Nelson obviously have evolved from this earlier form. It is comforting to realize that when the Thule Culture people set out from western Alaska on their long trek to Greenland they had some assistance in hauling the sleds.

KAYAKS AND UMIAKS

Kayaks were in common use when Ray's party wintered at Point Barrow but have since been almost completely abandoned. The Point Barrow kayak described by Murdoch depended on the gunwales for its longitudinal strength.[7] Semicircular wooden ribs, with the ends mortised into the gunwales and secured by wooden treenails, formed the rounded bottom of the vessel. Just forward of the manhole, the deck bulged upward to provide room for the paddler's knees; otherwise it was flat and straight; neither the bow nor the stern was upturned.

The well-constructed Point Barrow umiaks are still made; there is no substitute for this

[1] Rainey, 1941, 500; Collins, 1937, 339.
[2] Geist and Rainey, 1936, Pl. 31, Fig. 1.
[3] Rainey, 1941, 500, Fig. 16, Items 7–9.
[4] Jochelson, 1928, 52, Fig. 31.
[5] Giddings, 1952, 62–63.
[6] Mathiassen, 1927b, 60–63.
[7] Murdoch, 1892, 328–335.

strong light boat when working among the ice floes during the spring whaling. Murdoch gives a good description of the frame of this boat.[1]

UTKIAVIK-NUWUK: A rather crude toy kayak made of bark, from Location X in Utkiavik, verifies Murdoch's description of straight decks without upturned bows or sterns on recent Point Barrow kayaks. In the purchased collection from Utkiavik there is a slightly curved piece of antler, 14 cm. long and 1.3 cm. in diameter, with a slight notch and a lashing hole in each end. This may be a rib used towards either the bow or the stern of a kayak. A tapering piece of wood, 49 cm. long, triangular in section with rounded corners and marks of baleen lashing, is perhaps a kayak gunwale (Fig. 75f).

From House B, a short piece of wood notched on each end (Fig. 75g) appears to be a support to join the gunwale and manhole coaming as mentioned by Murdoch.[2] A similar piece came from Cut 2, Section 2. The fragment of the blade of a paddle for an umiak or kayak was found on the floor of House A. The purchased collection from Utkiavik included an antler crotch on which to rest the whale harpoon (Fig. 75i). Purchases from Nuwuk included a wood model of an umiak 10 cm. long (Fig. 75h), the rib of an umiak, and a bailer made of antler (Fig. 75j) similar to the one illustrated by Murdoch.[3]

Two spatula-shaped implements made of the palm of caribou antler are used to scrape ice from umiak covers when the boats are taken out of the water (Fig. 75d–e). These tools are in constant use during the whaling season. Two were in the collection purchased from Utkiavik, and two more were from Nuwuk.

NUNAGIAK: From Mound C, Find 1, there is a short fragment of wood, 2.5 cm. wide, convex on one side, flat on the other, provided with a small lashing hole, which probably is a longitudinal strake for a kayak. A bailer made of antler, identical to the one described above from Nuwuk, came from Entrance D, beneath Mound C (Fig. 76b).

BIRNIRK: At Birnirk evidence of the use of kayaks and umiaks is fairly abundant. Most informative are the toys that are usually made of the large pieces of bark that float in on the beaches. Four of the kayak models are about 11 cm. long. In two the bow is broken off, but the two complete models demonstrate that, in contrast to the recent Barrow kayaks, those made at Birnirk had flat decks and upturned bows (Fig. 78a–c). These toys came from the floor of House A, Mound A, Structure B of the same mound, Section 2, Cut 13 in Mound J, and from the house floor in Mound R. Each model has a manhole in which a figure was placed.

An interesting little wooden model, 8 cm. long, came from the floor of the house in Mound C (Fig. 78d). This has an upturned bow like the kayak models and the lines of a kayak,

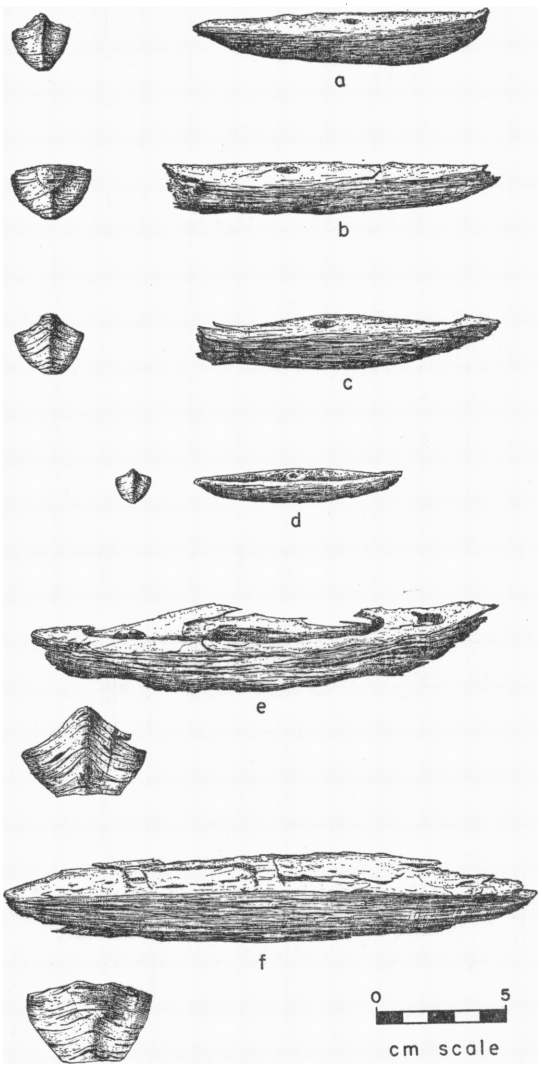


FIG. 78. Toy boats made of bark from Birnirk.

[1] Murdoch, 1892, 335–344.
[2] Murdoch, 1892, 330.
[3] Murdoch, 1892, Fig. 346.

but it is hollowed out like an Indian dugout canoe. A raised area in the bottom, with a small hole for inserting the figure of a single man, shows that this is intended to represent a small, one-man boat, not an umiak.

Two broken forward ends of kayak gunwales were found: one came from below Structure C, Mound A, and the other was discarded by Eskimo excavators in Mound D (Fig. 79a–b). The strong upward curve on the ends of these gunwales corroborates the assumption that the Birnirk Period kayaks had upturned bows, the form suggested by the kayak models. Another section of a kayak gunwale with two drilled holes, apparently for the lashing to the ribs, was found in Mound A. These three fragments are similar in cross-section. The inner surface of the gunwale forms a right angle, but the outside, where it came in contact with the skin covering, is smoothly rounded.

Three umiak models made of bark and varying from 16.5 to 20 cm. in length leave no doubt as to the presence of this type of canoe (Fig. 78e–f). In one two thwarts are indicated; in the second, three; the third is so broken that these features are obscured. All these models come from Mound A: one from the roof of House A, one from the floor, and one from Structure H.

Two crudely adzed crosspieces used in the bottom of the umiak were found in Mound A; a complete specimen (Fig. 79f) beneath the floor of Structure F and a broken one from Section 2, Cut 3. This type of crosspiece was lashed above the keel rather than being passed through a mortised slot in the keel as in modern umiaks. The ends have shallow notches where they were attached to the strakes that form the sides of the bottom of the boat.

Three fragments of canoe paddles were found; two were in Mound A below Structures B and C (Fig. 79c). The third came from the surface of Mound D where it had been excavated by Eskimo. None of these fragments is complete enough to demonstrate fully the shape of the blade. However, by comparison with the two complete paddles in the Van Valin Collection illustrated by Mason,[1] it may be seen that the two fragments from Mound A were parts of paddles that widened towards their tips and had rounded ends.

COMPARISONS: Use of the kayak is inferred for the Okvik Culture of St. Lawrence Island[2]; positive evidence is missing at Ipiutak.[3]

Bark models and part of a toy umiak keel present evidence that both umiaks and kayaks were in use on St. Lawrence Island at the time of the Old Bering Sea Culture.[4] Unfortunately it is not possible to decide whether the bow of the kayak was upturned as it is in the Birnirk specimens. Judging from the photograph, it was not. Bark toys, however, are very fragile, and the bow may have broken off along the laminations of the bark. Part of a canoe paddle is from the same site, Miyowagh.

An ivory model of a kayak and paddler from the Ievoghiyoq Site at Gambell has the straight bow of the Punuk Period kayak. From Late Punuk deposits in the Kukulik Site on St. Lawrence Island, Geist and Rainey illustrate a bottom crosspiece for an umiak identical to crosspieces found at Birnirk,[5] and Rudenko illustrates two from the Sirhenik Site in Siberia.[6]

Kayak models and drawings from Thule sites in Central Canada have slightly upturned stems and sterns, a form agreeing in part with the models from Birnirk.[7] The umiak was also known to the Thule Culture people. A bottom crosspiece lashed on top of the keel from Qilalukan resembles crosspieces from Birnirk.[8]

Umiak bottom crosspieces identical to those from Birnirk were found in a complete boat frame in Peary Land, northwest Greenland, by Eigil Knuth.[9]

ANTLER STRIPS, POSSIBLY KAYAK RIBS

At Utkiavik, Nunagiak, and Birnirk a number of obviously utilitarian artifacts were found which I am unable to identify (Fig. 80). These are strips of antler about 40 cm. long, split lengthwise so that one side is flattened or slightly concave where the cancellous core has been removed; the other side is left rounded, with the natural surface of the antler. Both ends are slightly notched and are usually provided with a hole for lashing; some specimens,

[1] Mason, 1930, Pl. 2.

[2] Rainey, 1941, 547.
[3] Larsen and Rainey, 1948, 147.
[4] Collins, 1937, 158–159, Pl. 59, Figs. 1–3, 6.
[5] Geist and Rainey, 1936, P. 65, Fig. 11.
[6] Rudenko, 1947, Pl. 27, Figs. 7–8.
[7] Mathiassen, 1927b, 63.
[8] Mathiassen, 1927a, Fig. 52; 1927b, 64.
[9] Knuth, 1952.

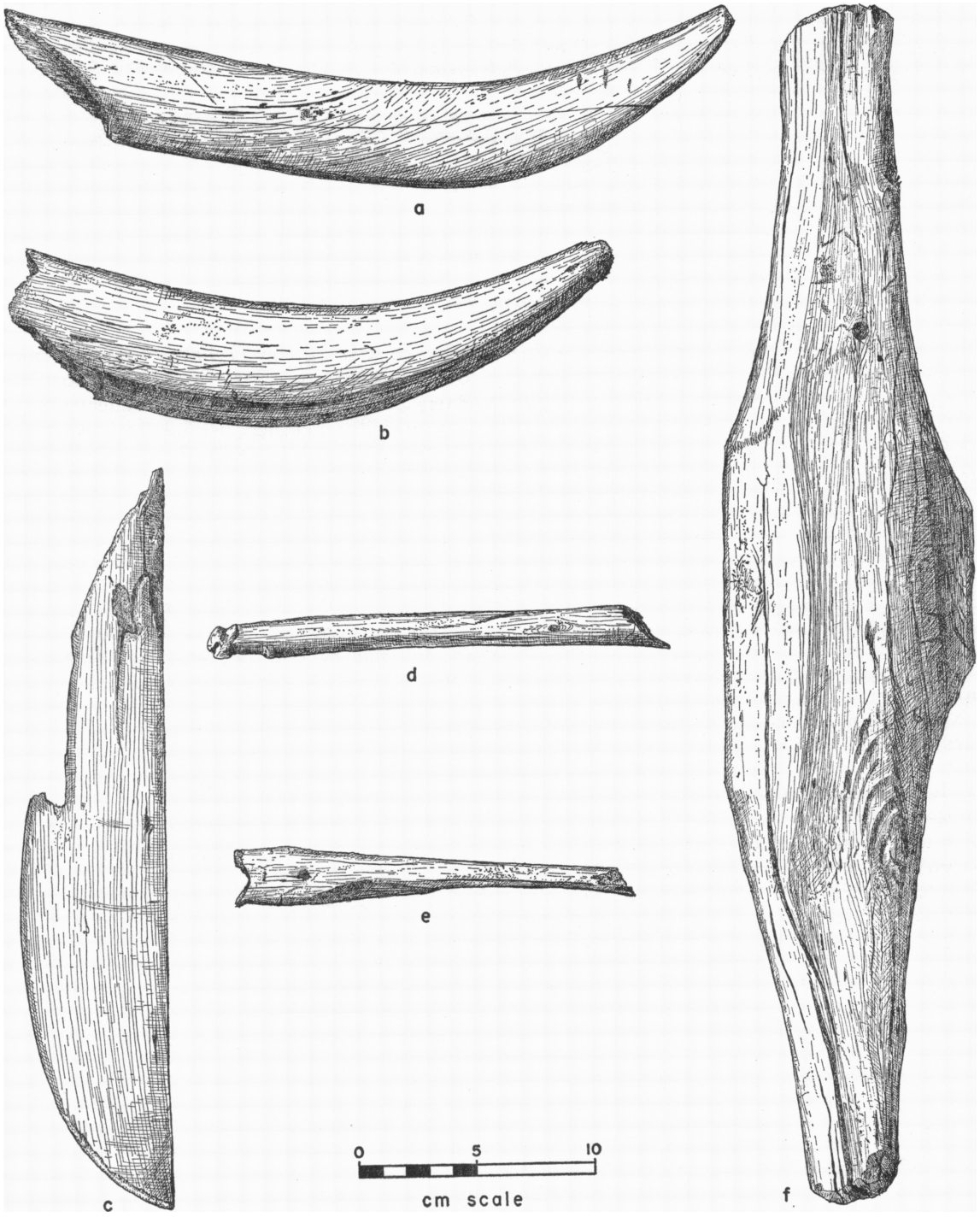


FIG. 79. Boat parts from Birnirk. a–b. Bow pieces for kayak. c. Part of paddle blade. d–e. Possible kayak strake and rib. f. Bottom crosspiece for umiak.

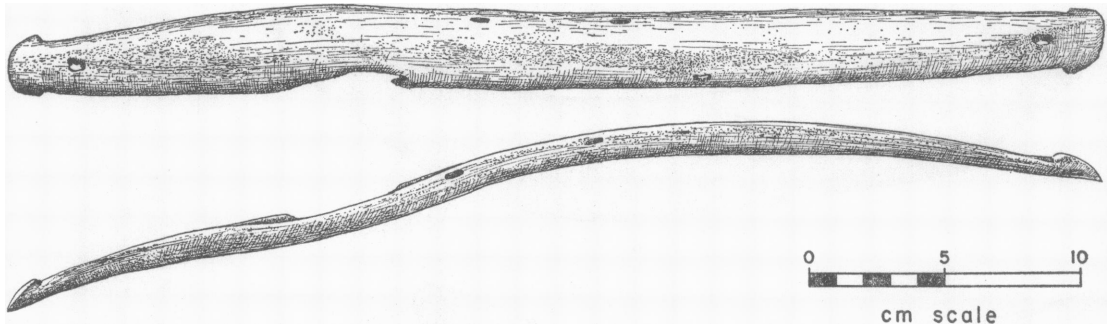


FIG. 80. Antler strips, probably kayak ribs, from Birnirk.

however, lack these holes. Spaced on each side of the center of the strip, staggered near the edges, are pairs of slots, evidently for baleen lashings. These slots are probably intended to permit the lashing of two structural members at right angles to the pieces of antler.

One each of these objects was found at the following localities:

Utkiavik, floor of House A
Nunagiak, Mound C, Cache B, Entrance D, and above House X (the object from Entrance D was made of wood, but in other respects resembled the antler specimens)
Birnirk, Mound A, floor entrance to House A, Structure E, and floor of Structure C
Mound D (from Eskimo diggings)
Mound J, Floors 1 and 2 of House A

Most of these slats have been broken, which indicates that they were subjected to rather hard use. Mathiassen found 16 identical strips of antler at Naujan. He, too, is somewhat uncertain as to their use: "As regards the use of these one might imagine frames for drying racks, drums, etc."[1] His suggestions are not very convincing, but I have little better to offer. Possibly these are ribs for kayaks. The flattened sides of the staves (the concave sides) are carefully smoothed, possibly to prevent the fraying of the skin covering. They could hardly have been intended for the bottom ribs of the western type of kayak, for they do not have enough arch, and lashing holes are provided for only two longitudinal strakes—not the six or eight usually found. Possibly these are top ribs used aft and forward of the manhole.

It is also possible that these are floor slats for the Siberian type of sled described above (p. 156). As Nelson's illustration shows, the light floor slats of these sleds are lashed either directly to the antler sled arches or to two longitudinal members that are lashed in turn to the arches.[2] This would be a more convincing explanation if the objects were not so thin and weak. It seems unlikely that so much of the antler would have been cut away if the staves were intended for this use.

[1] Mathiassen, 1927a, 78, Pl. 34, Fig. 1.
[2] Nelson, 1899, Fig. 62.

MEN'S TOOLS

MEN'S KNIVES

CROOKED KNIVES AND SIDE-BLADE KNIVES

The crooked knife was in common use when Murdoch reported on the Point Barrow people,[3] and is today perhaps the most useful item in a man's tool kit. Murdoch described two types: a large crooked knife for cutting wood, and a smaller knife for working bone and ivory.

UTKIAVIK-NUWUK: In classifying the archeological collections, I have attempted to follow Murdoch's suggestion concerning the function of the differently sized crooked knives and have listed them in two groups according to their length. The division of the groups at a length of 17 cm. is rather arbitrary, and I have no assurance that these are actually functional classes.

The crooked knives in use today, and some of those illustrated by Murdoch, have generally markedly curved iron blades that are usually riveted to one side of the handle end. Virtually

[3] Murdoch, 1892, 157–160.

all the knife handles in this collection were intended for iron blades. In all examples but one the blade was set into a narrow slot in the side of the handle. All are made of antler. The longer handles have a marked curvature, particularly near the blade, and are flattened ovals in section. Some have suspension holes in the end opposite the blade (Fig. 81a). The short handles are less curved and have blunt ends as described by Murdoch. Some are oval in section; others have almost round grips and are flattened towards the blade (Fig. 81b). Many handles have rounded depressions that show they have been used as bowdrill socket pieces.

The crooked knives from Utkiavik come from the following localities:

	Lengths	
	9.5–16.5 cm.	17–26.5 cm.
Above House A	5	3
Floor, House B	—	1
Location X	—	4
Cut 2, Section 1	1	1
Purchased	60	25

The recent collections contained only one knife with a slate blade set in a slot in the side of the handle (Fig. 81c). Murdoch purchased knives of this type, but some were so obviously newly made that he doubted their authenticity.[1] However, the present specimen seems to be genuine, and, as Mathiassen points out, the occurrence of a number of similar specimens in Thule Culture sites, as well as other western sites, leaves no doubt that such knives were used.[2]

Nunagiak: Only two crooked knives were found at Nunagiak (Fig. 82a–b). Both came from the recent deposits of Cut 2 (one from Section 2 and the other from Section 6) and were of the short-handled variety with narrow slits for iron blades.

Birnirk: No bone or antler-handled crooked knives were found at Birnirk. The wooden handle for a side-blade knife, apparently for a thin slate blade, was found in Mound A, Cut 3, Section 7 (Fig. 83a).

Comparisons: Crooked knives do not seem to be an ancient cultural element in the Point Barrow Area, as they are completely missing from deposits of the Nunagiak Period and earlier.

On St. Lawrence Island wooden handles of side-blade knives come from Old Bering Sea deposits,[3] and crooked knives made of walrus ribs, with slots to hold stone blades, first appear in the Punuk Period.[4] Giddings does not mention crooked knives from the sites in his Kobuk River sequence, but the tool is currently in use in that area.

Crooked knives seem also to be absent from the Point Hope sequence described by Larsen and Rainey, but, again, they are in use in that area today. A rather common form of whittling knife found at the Ipiutak Site, consisting of a flaked stone blade set into a slot in the side of a handle usually of wood, is the probable ancestor of the modern crooked knife.

It is odd that only one wooden handle for a side-blade knife was found at Birnirk. This one is directly comparable to the wooden knife handles from Old Bering Sea Culture deposits on St. Lawrence Island that Collins classifies as Type 3.[5]

Mathiassen notes that the class he designates as "whittling knives with blade socket in one edge near the point" is very common in the Thule Culture sites of Central Canada.[6] The blades are of chipped flint; slate is not mentioned. The bone handles are straight or slightly curved.

De Laguna has discussed in some detail the distribution of knives with blade slits near one end, concluding that the modern crooked knife is derived from prototypes found in the Neolithic of Siberia.[7] Why, then, is this stone-bladed form absent from the Birnirk deposits when it is such a prominent element in the Thule Culture? The Thule peoples possibly learned about this form of knife after arriving in the Central Region directly from the Bering Strait Area. There seems to be little doubt that the modern wide distribution and popularity of the crooked knife result from Thule influence.

Composite or "Splitting Knife" Handles

A specialized form of knife used to work bone,

[1] Murdoch, 1892, 160–161, Fig. 117.
[2] Mathiassen, 1927b, 69–70.
[3] Collins, 1937, Pl. 38, Figs. 3–4.
[4] Collins, 1937, 231–232.
[5] Collins, 1937, 144, Pl. 38, Figs. 3–4.
[6] Mathiassen, 1927b, 69.
[7] De Laguna, 1947, 179–180.

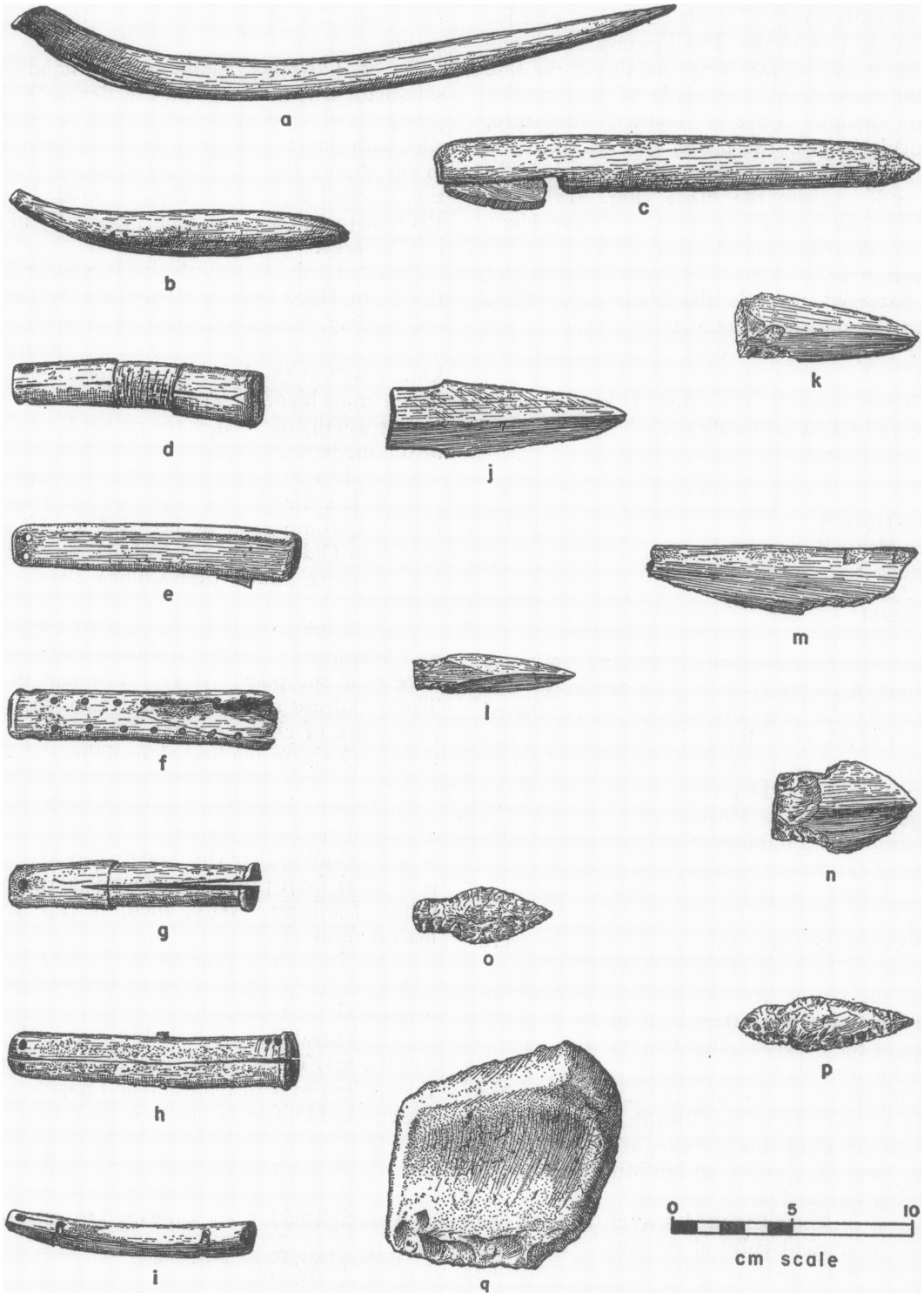


FIG. 81. Men's knife handles, blades, and a whetstone from Nuwuk and Utkiavik.

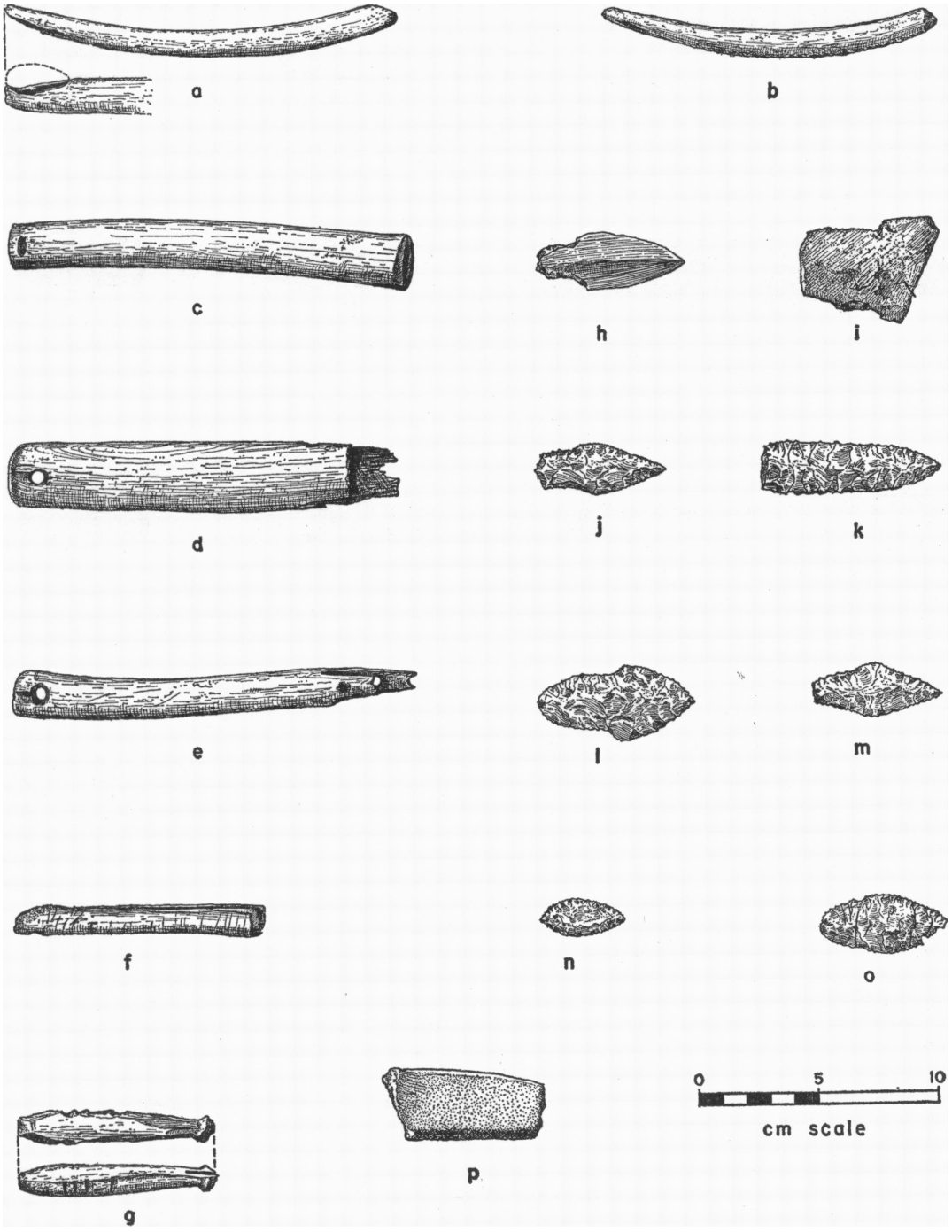


FIG. 82. Men's knife handles, blades, and a whetstone from Nunagiak.

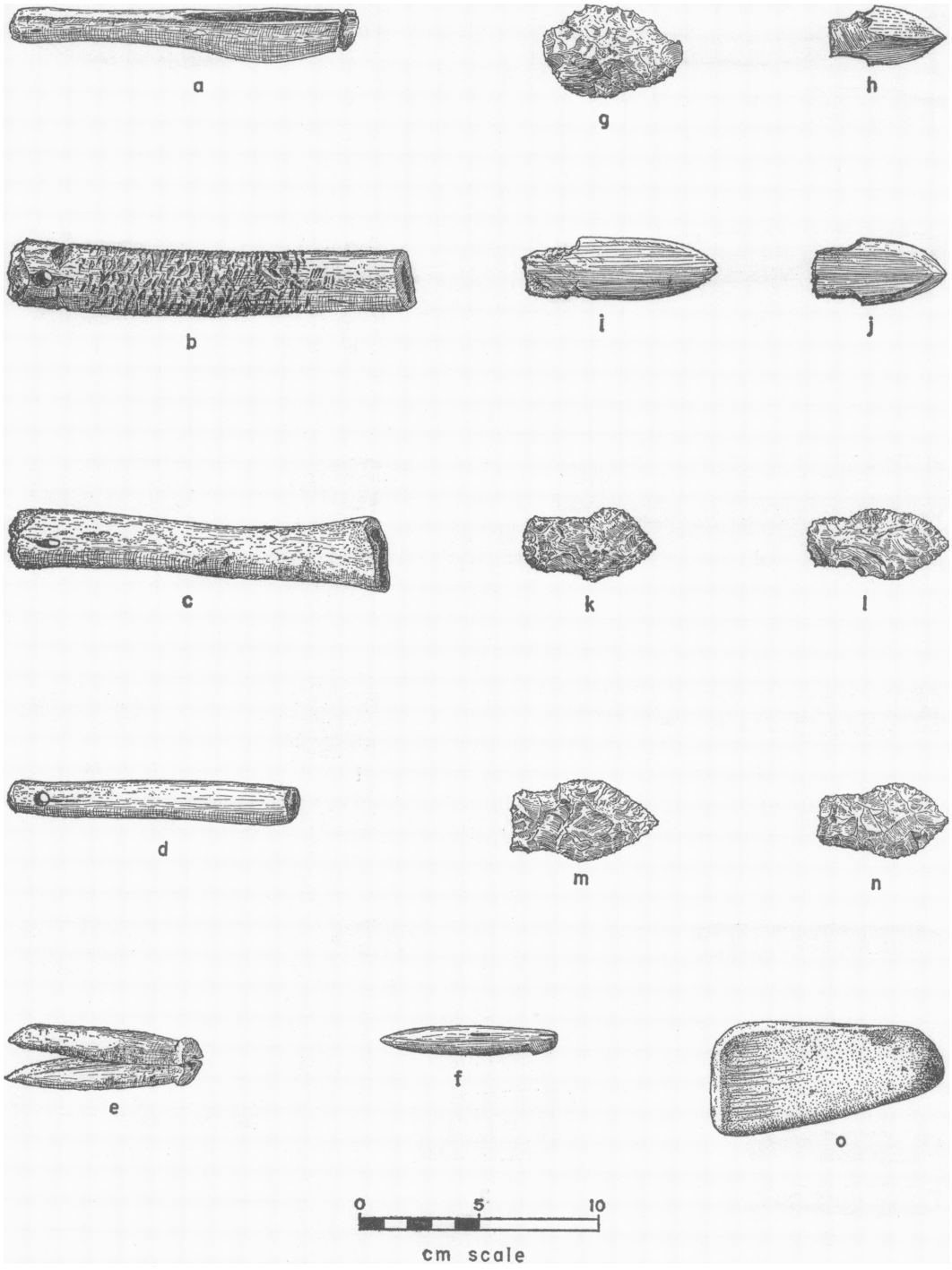


FIG. 83. Men's knife handles, blades, and a sharpening stone from Birnirk.

antler, and ivory was described by Murdoch as a "chisel." Unfortunately, he had no opportunity to observe this tool in use.[1] When the two-piece handles of these knives are tightly lashed together, they hold a small, burin-like blade of iron or flint very firmly. The Eskimo have procured iron for some of these tools for a long time. Unfinished specimens from old sites (Fig. 53g), as well as modern observation, make clear the method of use. The narrow, burin-like blade was repeatedly drawn along a groove until it was possible to break the antler or ivory. The cutting of slender rods of antler to make arrowheads was a typical project. That this one-tooth saw is the direct descendant of the Mesolithic and Upper Paleolithic burin has been ably set forth by De Laguna, Collins, and Meldgaard.[2]

UTKIAVIK-NUWUK: The split handles for composite knives from Utkiavik are nearly all made of antler. The blade slits are consistently narrow, designed for iron blades or thin flint flakes. The two halves of the handle were lashed at the blade slit end, and a ridge prevented the lashing from slipping off. About half of the knives have no provision for assuring the alignment of the parts except the lashing. On the others the alignment is assured in several different ways. Most popular is the use of one or more pins that pass through holes in each half of the handle (Fig. 81h). In another method the two halves of the handle are not completely cut apart; a slit is cut two-thirds of its length, and the antler has enough spring so that the lashing can pull the halves together and thus clamp the blade tightly (Fig. 81g). An unusual method of lashing is illustrated in Fig. 81i. These handles range in length from 9 to 19 cm., averaging about 11 cm. When the halves of the handle are fastened together, the cross-section becomes a flattened oval, resulting in a handle that differs little in shape from the hunting knife handle from Utkiavik and Nuwuk described below (p. 167).

NUNAGIAK: A single composite knife handle from Cut 1, Section 1, at Nunagiak (Fig. 82f) belongs with the varieties described from Utkiavik and Nuwuk. The four additional specimens from older sections of the site (Fig. 82g) compare with the composite knife handles that are described below from the Birnirk Site. All but the complete ivory handle (Fig. 21j) from the Punuk House are made of antler.

BIRNIRK: Composite knife handles or, to be more exact, the halves of these handles, were very common at the Birnirk Site. They range in length from 4 to 11 cm. and average about 7 cm. This dimension is markedly shorter than the average of 11 cm. for the similar knife handles from Utkiavik and Nuwuk. The side of the handle half that fits against its mate is flat towards the blade, but towards the butt end the surfaces are beveled so that when the halves are placed together a wedge-shaped opening is provided (Fig. 83e). Perhaps a small wedge was sometimes used to increase pressure on the blade. The other sides are rounded and roughened for nearly the entire length to receive a lashing. When the handle halves are placed together, the completed handle is rounder in section than the handles from the later sites. Large ridges prevent the lashing from slipping off the blade end of the handle. The blade ends of the handles usually slope; in contrast, the Utkiavik specimens generally have this end cut off square.

Blade slots in nearly all the handles from Birnirk are placed in only one end of the handle; two small specimens, however, have slots in both ends. The slots are short and narrow enough to suggest that all these knives had iron blades.

Most of the handles have a provision to assure the alignment of the halves of the handles. Usually this consists of two small elongated slots placed about midway along the length of the flat faces. Small splines of bone engage the slot in each handle half. In a few, small drilled holes and short bone dowels have performed the same function.

A complete knife with an iron blade in place was found on the floor of House A, Mound A (Fig. 83e). This blade, a small triangular piece of iron, quite thin and about 5 mm. on a side, was very well preserved. The frozen condition of the deposit had apparently retarded oxidation. A spectroscopic analysis has been made through the courtesy and interest of Dr. E. R. Littman of the Enjay Company. This demonstrated that the iron was extraordinarily pure. Dr. Littman is of the opinion that iron of this

[1] Murdoch, 1892, 172–173, Figs. 143–144.

[2] De Laguna, 1947, 193–194; Collins, 1950, 25–26; Meldgaard, 1952, 25–229.

purity could have been obtained only through the reduction of bog ore.

COMPARISONS: There seems to be general agreement that the "composite knife," or "splitting knife," is a descendant of the burin. However, we do not know when this tool was first provided with a handle. The old Dorset Culture of the eastern Arctic has chipped burin blades held in composite handles made according to the principle described above.[1] The parts of the handle are unequal in size; one of the halves is very short. The true composite knife handle, directly comparable to that described from Birnirk, but with larger slits to accommodate stone blades, is a late Dorset tool.[2]

Knife handles essentially similar to those described from Birnirk are illustrated from the Uwelen Site near East Cape, Siberia, by Rudenko.[3] Knives of this same type were also described from the Okvik Site on Punuk Island. Rainey's Type 1 knife handle, obviously made for metal blades, compares with the handles from Birnirk.[4] His Type 2, with partially split handle and squared-off end, is similar to a variation of the late handles from the Point Barrow Area (Fig. 81g).[5]

From the Old Bering Sea Period deposits at Gambell, St. Lawrence Island, Collins describes composite knife handles that are nearly all made of ivory, with blade slits for iron or flint blades. Although the meeting faces of these handles are straight, they otherwise resemble the Birnirk handles in size and shape.[6] The handles from the later Punuk Period deposits are generally made of walrus rib, and the meeting faces are beveled towards the butt end as are the Birnirk specimens.[7]

The majority of the composite knife handles found at the Ipiutak Site at Point Hope were not completely split apart, so in principle were more like one group of the Utkiavik and Nuwuk handles.[8] As mentioned above, this same variety was found at the Okvik Site.

This tool, which Mathiassen calls "whittling-knife handles, formed by lashing two side pieces together," is a typical element of the Thule Culture sites of Central Canada.[9] There, the handles are designed either for a single blade or for a blade in each end. The single-end handles illustrated from Naujan have the same size, cross-section, slope of the blade end, and bevel of the flat face towards the butt as do the handles from Birnirk. It seems clear that the Thule form could be derived directly from the Birnirk one.

The disappearance of the partially split handle noted in the Okvik-Ipiutak cultural horizon and the reappearance of this same form in the Utkiavik deposits present a puzzle. This design must have been retained through the intervening span of time in some neighboring area.

MAN'S KNIFE HANDLES WITH BLADE SLOT IN END

Murdoch's classification of the slate-bladed hunting knives that he secured at Point Barrow is based on the shape of the blade. He lists five types: (1) long, straight, or slightly curved blades with edges on two sides; (2) short, broad blades with markedly curved edges[10]; (3) long, broad, lanceolate blades with short, straight hafts; (4) long, parallel-sided blades that round to the point (possibly not authentic); and (5) single-edged blades with straight backs and an edge that curves to the point.[11] This classification can be applied to the slate knife blades from Utkiavik and Nuwuk. The handles for these knives must be considered separately.

UTKIAVIK-NUWUK: Handles for hunting knives are among the most numerous objects in the collection. Nearly all of them are made of antler, a few are of bone, but none is of wood as were several of the knives purchased by Murdoch. A few have wood grips. They range from 8 to 18 cm. in length, are flattened oval in section, and have a narrow blade slot in one end into which the tang of the blade was wedged, with no other means of securing it. A few handles have lashing grooves around the blade end, but this lashing served merely to reënforce the handle and did not secure the blade. In the

[1] Meldgaard, 1955, 167.
[2] Collins, 1953, 38.
[3] Rudenko, 1947, Pl. 4, Figs. 3–6.
[4] Rainey, 1941, Fig. 18, Items 1–4.
[5] Rainey, 1941, Fig. 18, Items 5–7.
[6] Collins, 1937, 145–146, Pl. 38, Figs. 5–7.
[7] Collins, 1937, 231, Pl. 78, Figs. 4–5.
[8] Larsen and Rainey, 1948, 82, Pl. 8, Figs. 10–14, Pl. 43, Fig. 7.
[9] Mathiassen, 1927b, 72.
[10] As an interesting aside: as the present collection contains only one short, double-edged, ground slate blade, I am led to suspect that Murdoch, in spite of his usual cautiousness, mistakenly accepted ancient blades in new handles as his "second class." See Murdoch, 1892, 152, Fig. 101.
[11] Murdoch, 1892, 150–154.

butt end there usually are holes for a suspension cord. These are arranged in various ways: a single hole drilled from one flattened side to the other (Fig. 81g); a single hole drilled through the wider axis (Fig. 81d); a single hole drilled through the wider axis, with a connecting hole drilled to the end of the handle (Fig. 81f); and two holes drilled through the flattened axis, side by side, connected by a shallow groove on one side (Fig. 81e).

Many of the knife handles are roughened to provide a better grip. Whipping was most popular, with or without a depressed section in the handle to retain the cord (Fig. 81d). A second popular method was to drill a series of holes along the length of the handle and rove rawhide cord through them and around the handle (Fig. 81f).

Long, double-edged, ground slate blades for hunting knives are also common (Fig. 81j). These correspond to Murdoch's first group, referred to above. These blades range from 8 to 15 cm. in length and are made of hard, gray, black, red, or purple slate. The blade is ground with flat facets, forming a median ridge along each face of the blade. The tangs for insertion into the handles are narrower than the blades.

Murdoch collected four short, double-edged, ground slate blades for hunting knives.[1] The present collection contains only one, from the floor of House A, Utkiavik (Fig. 81n). It is made of dark gray slate. As is demonstrated below, this type is more common at earlier sites.

Murdoch's fifth class consisted of single-edged, ground slate blades for hunting knives. In the present collection these are made of red, gray, or black slate. The over-all lengths vary from 3 to 9 cm. The tangs are set off from the blades by shoulders, the backs are nearly straight, and the blades curve to a sharp point (Fig. 81m).

Chipped knife blades were not described by Murdoch. Several blades found at Utkiavik probably belong to this category rather than to the class of chipped arrowpoints described above. These are thin, well-flaked, with broad stems for hafting. They are too broad to have been used in antler arrowpoints. Had I not found these points, I would have thought that the purchased specimens came from earlier sites, for they are very similar to a class of chipped blades from Birnirk (Fig. 81o–p).

NUNAGIAK: Antler handles for men's hunting knives were also common at Nunagiak, when the limited degree of excavation there is considered. These handles may be divided into two groups. One conforms in all details to the knife handles from Utkiavik and Nuwuk sites described above. The second is like the smaller handles found at the Birnirk Site. The latter is described in more detail below. Two of the handles are made of wood. These came from Cut 2, Section 5, and Entrance D, Mound C.

Two long, double-edged, ground slate blades were found, both from upper levels of Cut 2. These are similar to those described above from Utkiavik.

Short, double-edged, ground slate knife blades, with stems about as long as the blades, average between 6 and 7 cm. in over-all length. Both of the markedly curving blade edges are sharpened, and the sharpening facets sometimes meet at a median ridge (Fig. 82h).

Only one single-edged ground slate blade was found.

Chipped knife blades with stems are made of a fine-grained gray or a translucent light brown flint, with good flaking characteristics. They are somewhat similar in shape to the short, double-edged knives with straight stems about as long as the blade, rounded shoulders, and curved blade edges that end in a sharp point. These blades are quite thin (Fig. 82j, l–m).

Small, ovate, thin blades, nicely chipped from light or dark gray flint, are also probably knife blades (Fig. 82n–o). These blades were presumably mounted onto the sides of handles; but handles with side slots are much more rare than are ovate blades.

BIRNIRK: The hunting knife handles from the Birnirk Site can be easily differentiated from those described for the recent sites of Utkiavik and Nuwuk. While the later knife handles are almost all carved to a flattened oval cross-section, those from Birnirk are round and usually have the original surface of the slender rod of antler from which they were made. Diameters of these handles average about 1.5 cm.; in length, they range from 11 to 16 cm. None has the drilled holes or other provisions for whipping the handle grips. However, one Birnirk handle had been roughened by cuts (Fig. 83b) such as were popular later. These handles do not have the rather complex systems of suspen-

[1]Murdoch, 1892, 152, Fig. 101.

sion holes that are described above; most of them have a simple hole drilled near the butt (one was cut, see Fig. 83c). In a few examples a small ornamental depression has been carved, extending from this hole towards the blade end (Fig. 83d). All handles listed in Table 2 are made of antler except the wooden one from Structure G, Mound A. A second wooden handle with a slot for a side blade was found in Cut 3 of Mound A (Fig. 83a). This is grooved at the end for lashing to prevent splitting of the handle.

The long, double-edged, ground slate knife blades described above from Utkiavik and Nuwuk were not found at Birnirk. However, short, double-edged blades are fairly common. These are similar to those described under this category from the later deposits. They are made of dark gray slate and have a broad stem, usually chipped along the edges to facilitate hafting. The short blades, commonly a little longer than the stems, have curved edges (Fig. 83h–j).

Short, double-edged, chipped flint knife blades with stems, carefully made from a waxy gray flint or of brownish, translucent smoky quartz, are the most popular type at Birnirk (Table 2 and Fig. 83k–n). Their over-all length is about 5 cm. The stems, almost as long as the blades, are relatively wide, often with curving bases that recall the flint arrowpoints of the period. The double-edged blades are thin, and both edges curve to the point.

Small, thin, chipped ovate blades, usually with blunt points at both ends, are made of the same types of flint described above for flint blades (Fig. 83g). These resemble side blades for knives and similar implements, but, as only one handle with a slot for such blades was found, this use seems improbable.

COMPARISONS: Table 2 demonstrates a very clear temporal separation between knife forms. The Utkiavik type of handle, long, double-edged, ground slate blades, single-edged, ground slate blades, and Utkiavik composite knife handles are characteristic of Utkiavik and Nuwuk. The Birnirk type of handle, short, double-edged, slate blades, stemmed chipped blades, ovate chipped blades, and the Birnirk version of the composite knife characterize the Birnirk Site. As is to be expected, Nunagiak shares both early and late forms.

In addition to the change in forms, new varieties of slate were introduced into the Point Barrow Area at the beginning of the Utkiavik Period. The slate used for knives and other implements at Birnirk is either black or dark gray. At Utkiavik a fine-grained green slate and a reddish purple slate were also employed. The sources for these varieties of slate are not known to the writer. It may be significant that Mathiassen mentions that the harpoon and lance blades from Naujan are made of three varieties of slate: " . . . a very fine-grained blue kind, a fine-grained reddish kind, and a more coarse-grained gray variety."[1] Perhaps, as were the soapstone lamps and pots, this reddish slate was traded into the Point Barrow District after the Thule Culture became established in the Central Region.

The side blade set into a slot in the handle is the most common form of knife at the Uwelen and Okvik sites near Bering Strait. This form continued to be popular into the Old Bering Sea Period. However, the handle with an end blade is also found.[2] Among the slate blades for these handles are forms identical to those from Birnirk.[3] Old Bering Sea Period hunting knife handles with end sockets were often made of wood. Among the bone handles a few (Collins' Types 2 and 3) are comparable to those from Birnirk.[4] Double-edged, ground slate blades[5] and short, double-edged, flaked blades,[6] similar to the Birnirk types, are also part of this complex. Chipped knife blades disappear by Punuk times, but the ground slate forms continue.[7]

Knife blades from the Ahteut Site on the Kobuk River (1250 A.D.) compare with the types from both Utkiavik and Birnirk. Giddings illustrates long, double-edged, ground slate blades; single-edged, ground slate blades; stemmed, short, ground slate blades; stemmed, chipped flint blades (labeled "projectile or lance," but similar in shape to those called knives here), and ovate blades.[8] The chipped forms disappear by the time of the Ekseavik Site (1400 A.D.), but the slate forms similar to

[1] Mathiassen, 1927a, 32.
[2] Rainey, 1941, Fig. 18, Item 8.
[3] Rudenko, 1947, Pl. 3, Fig. 15.
[4] Collins, 1937, 146, Pl. 38, Figs. 8–10.
[5] Collins, 1937, Pl. 39, Figs. 6–12.
[6] Collins, 1937, Pl. 40, Figs. 1–12. Collins classes some as arrowheads.
[7] Collins, 1937, 232.
[8] Giddings, 1952, Pl. 17, Figs. 1, 15, 5, 9–11, 2.

TABLE 2

MEN'S KNIVES

Location	Handles, Utkiavik Type	Handles, Birnirk Type	Long, Double-edged, Slate Blades	Short, Double-edged, Slate Blades	Single-edged, Slate Blades	Chipped Blades, Stemmed	Ovate Chipped Blades	Composite Knives, Utkiavik Type	Composite Knives, Birnirk Type
Nuwuk, purchased	29	—	12	—	1	—	—	15	—
Utkiavik									
Purchased	86	—	39	—	48	—	—	42	—
Above House A	5	—	4	—	1	—	—	5	—
Floor of House A	—	—	—	1	1	1	—	1	—
Cut 2, Section 1	1	—	2	—	3	1	—	—	—
Cut 2, Section 2	—	—	1	—	1	—	—	—	—
Cut 2, Section 5	1	—	—	—	—	—	—	—	—
Cut 2, Section 6	1	—	—	—	—	—	—	—	—
Floor of House B	—	—	2	—	2	—	—	1	—
Cut 4, Section 2	—	—	1	—	—	—	—	1	—
Location X	—	—	—	—	—	—	—	1	—
Nunagiak									
Cut 1, Section 1	1	—	—	—	—	—	—	1	—
House G	—	—	—	—	—	—	—	—	1
Cut 2, Section 1	—	—	1	—	—	—	—	—	—
Cut 2, Section 2	1	—	1	—	—	—	—	—	—
Cut 2, Section 3	—	—	—	—	1	—	—	—	—
Cut 2, Section 4	—	—	—	1	—	1	1	—	—
Cut 2, Section 5	—	1	—	—	—	—	—	—	—
Cut 2, Section 6	—	—	—	4	—	—	—	—	—
Cut 4, Section 1	—	—	—	—	—	—	1	—	—
Cut 4, Section 3	1	—	—	2	—	—	—	—	1
Cut 4, Section 4	—	—	—	1	—	1	—	—	—
Mound C									
Entrance D	—	2	—	—	—	—	—	—	—
Structure E	—	1	—	—	—	—	—	—	1
Find 1	—	—	—	1	—	—	1	—	1
Above Punuk house	—	—	—	1	—	1	1	—	—
Punuk house	—	—	—	—	—	2	—	—	—
Miscellaneous from beach	—	—	—	—	—	1	—	—	—
Mound H, Cut 6, Section 1	—	—	—	—	—	—	4	—	—
Birnirk									
Mound A									
Cut 2, Section 1	—	—	—	1	—	1	—	—	—
Cut 2, Section 2	—	—	—	1	—	—	—	—	1
Cut 2, Section 6	—	—	—	—	—	1	—	—	—
Cut 3, Section 1	—	—	—	2	—	—	—	—	—
Cut 3, Section 2	—	—	—	—	—	—	—	—	2

TABLE 2—(*Continued*)

Location	Handles, Utkiavik Type	Handles, Birnirk Type	Long, Double-edged, Slate Blades	Short, Double-edged, Slate Blades	Single-edged, Slate Blades	Chipped Blades, Stemmed	Ovate Chipped Blades	Composite Knives, Utkiavik Type	Composite Knives, Birnirk Type
Cut 3, Section 3	—	—	—	—	—	—	—	—	1
Cut 3, Section 4	—	1	—	1	—	—	—	—	—
Cut 3, Section 5	—	—	—	—	—	—	—	—	1
Cut 3, Section 7	—	1	—	—	—	—	—	—	—
Cut 4	—	1	—	—	—	1	1	—	—
Roof 1 of House A	—	—	—	—	—	1	—	—	1
Entrance floor	—	—	—	—	—	1	—	—	1
Floor of House A	—	—	—	2	—	—	—	—	3
Floor of Structure B	—	1	—	—	—	—	—	—	—
Below Structure B	—	—	—	—	—	—	—	—	2
Floor of Structure C	—	—	—	1	—	—	—	—	—
Below Structure C	—	—	—	1	—	1	—	—	1
Below Structure D	—	—	—	—	—	—	2	—	—
Floor of Structure E	—	1	—	4	—	2	—	—	1
Below Structure F	—	1	—	—	—	—	—	—	—
Floor of Structure G	—	1	—	—	—	—	2	—	—
Floor of Structure H	—	—	—	—	—	3	—	—	2
Mound C, floor of House A	—	—	—	—	—	1	1	—	2
Mound H, Cut 9, Section 1	—	—	—	1	—	—	1	—	—
Mound J									
Cut 13, Section 1	—	2	—	—	—	1	—	—	—
Cut 13, Section 2	—	1	—	—	—	—	1	—	—
Floor 2 of house	—	—	—	—	—	—	1	—	1
Floor of house	—	1	—	—	—	—	1	—	1
Mound R, floor of House A	—	—	1	—	—	—	—	—	—
Mound S, Cut 6, Section 2	—	1	—	—	—	—	—	—	—

those from Utkiavik continue in use.[1]

Hunting knife handles with blade slots in the end were rare at Ipiutak; only three were found. Side-bladed knives were the most common type.[2] Chipped blades made to serve as knife blades were usually of ovate forms, and some of these resemble the ovate forms from Birnirk.[3] Forms similar to the short, chipped flint knife blades were also found.[4]

The somewhat limited collections from the later periods at Point Hope contain ovate chipped knife blades from burials that also yielded Birnirk harpoon heads.[5] Short, chipped flint blades and single-edged, ground slate blades accompanied Thule Type 2 harpoon

[1] Giddings, 1952, Pl. 34, Figs. 1, 10, 15, 21–22.
[2] Larsen and Rainey, 1948, 82.
[3] Larsen and Rainey, 1948, Pl. 12, Fig. 13.
[4] Larsen and Rainey, 1948, Pl. 14, Figs. 13–14.
[5] Larsen and Rainey, 1948, Pl. 87, Figs. 14–15.

heads.[1] The full range of the man's knife blades of slate found at Utkiavik came from the Tigara Period burials.[2]

Antler handles for hunting knives are very common in the earlier Thule Culture sites. These handles conform in most details to the Birnirk pattern rather than to the flattened Utkiavik form. Knives from Naujan retain the natural surface of the antler and, therefore, are round in section. They have a single simple suspension hole which tends to be triangular, and, while some of the grips are roughened, there is no evidence that they were customarily whipped with cord.[3] Slate knife blades from the same site include the long, double-edged form found at Utkiavik[4] and the single-edged form.[5] These are also common in the other sites of the Central Region.[6] It may well be that, while the hunting knife with blade inserted into the end was acquired by the Thule Culture from Birnirk the two late blade forms were developed in the Central Region and diffused from there to the Point Barrow Area. In the central part of northern North America the lanceolate blade with a tang is an old type which, as De Laguna has shown, has a wide distribution.[7] The Thule people may have derived the form from the Dorset Culture.

The probable origin of the single-edged blade is not clear. In her discussion of "single-edged slate blades for knives" De Laguna evidently refers to slate blades used in handles with side slits. Although this seems to be an old Western form, it cannot be the ancestor of the blades described above under the same term.

ENGRAVING TOOLS

Specialized tools for etching lines on bone or ivory are not described by either Murdoch or Nelson. This is entirely understandable, for the tool appears to have gone out of general use before the beginning of the contact period.

NUWUK: One tool which was apparently used for engraving was included in the collection purchased from Nuwuk. This is a half of the handle for the composite knife that has a small iron pin set into the butt end. A piece of a nail or similar fragment of iron was used.

NUNAGIAK: One engraving tool was found at Nunagiak. It was made of wood, 1 cm. in diameter and 9.5 cm. long. The round shaft tapers towards the end where the small tip was lashed into a small shallow socket cut into one side of the handle. The point and lashings are missing, but the socket is stained with rust, indicating an iron point.

BIRNIRK: Five engraving tools were found at Birnirk: three of wood, two of ivory (Fig. 105a–d). They range in length from 5.5 to 7 cm.; the diameter averages about 7 mm.

At the center of the handle, where the diameter is greatest, one of the ivory handles has ornamental slots cut in it (Fig. 105d). Each engraving tool has a tiny groove or flat facet against which an iron point had been lashed. A small ridge carved on the end of the handle prevented the lashing from slipping off. The points are missing from all except one handle which has a small mass of iron rust about 2 mm. in diameter and 4 mm. long sticking to the end (Fig. 105c).

All these handles have rounded butt ends that apparently were produced by a bearing as the tools were also used as drill spindles.

TABLE 3

ENGRAVING TOOLS

Location	Quantity
Nunagiak	
Mound H, Cut 6, Section 2	1
Birnirk	
Mound A	
Cut 3, Section 3	1
Roof of House A	1
Floor entrance to House A	1
Floor of Structure H	1
Mound C, floor of House A	1

COMPARISONS: Engraving tools directly comparable to those described above are found on St. Lawrence Island in the Punuk Stage.[8] At Point Hope similar tools come from the Ipiutak Site. As Larsen has so cogently argued, Asiatic iron must have been introduced into the Bering Strait Area at least by the time of the Okvik Phase.[9] This was at least as early as the begin-

[1] Larsen and Rainey, 1948, Pl. 88, Figs. 13–14.
[2] Larsen and Rainey, 1948, Pl. 90, Figs. 19–24.
[3] Mathiassen, 1927a, Pl. 17, Figs. 8, 10–13.
[4] Mathiassen, 1927a, Pl. 19, Figs. 5–6.
[5] Mathiassen, 1927a, Pl. 47, Figs. 6–7.
[6] Mathiassen, 1927b, 73.
[7] De Laguna, 1947, 173–175.
[8] Collins, 1937, 303–305.
[9] Larsen and Rainey, 1948, 82–84.

TABLE 4

WHETSTONES

Location	Sandstone Slabs	Hard Flint Pebbles	Sandstone Quadrated
Utkiavik			
Over House A	1	—	—
Floor of House B	—	1	—
Nunagiak			
Mound C, on beach below mound	1	1	—
Birnirk			
Mound A			
Floor of House A	1	1	—
Structure E	1	2	—
Structure H	—	1	—
Mound J, floor of House A	1	1	—
Kugok, Mound B, Burial 4	—	—	1

ning of the Christian era, if we may ignore the radiocarbon dates. The engraving tools from Birnirk tend to be somewhat simpler than the comparable examples cited; none is decorated, and the forms are simple. This absence of decoration conforms to the general lack of artistic development in the Birnirk Phase; so few engraved decorations are found that one wonders why this tool was necessary. Apparently this tool did not spread eastward with the Thule Culture.

WHETSTONES

Murdoch describes what he terms "very elegant" whetstones of jade, elongated rods with a suspension hole in one end.[1] These were used to give the final "set" to a blade edge after it had been ground on a coarser stone.

UTKIAVIK: Two types of sharpening stones come from Utkiavik. One consists of fragments of a fairly hard, fine-grained sandstone. The flat faces of these fragments usually show considerable signs of wear, doubtless resulting from the manufacture of ground slate implements (Fig. 81q). The other variety, corresponding to the tool described by Murdoch, was used for metal tools or for putting a fine edge on stone tools. These are elongated beach pebbles, with the sides polished from use. One has a hole drilled in one end but otherwise is not shaped. Provenience is shown in Table 4. None of the jade stones described above was found at Utkiavik.

[1] Murdoch, 1892, 183–185, Figs. 162–163.

NUNAGIAK: One of each type of sharpening stone was found at Nunagiak (Fig. 82p; Table 4).

BIRNIRK: The same two types of sharpening stones were found at Birnirk (Fig. 83o; Table 4).

KUGOK: One sharpening stone was found at the Kugok Site. This accompanied Burial 4 in Mound B (Fig. 9n). In contrast to the formless sharpening stones described above, this piece of hard gray sandstone is square in section, with faces 3 cm. wide; its over-all length is 12 cm.

COMPARISONS: The unshaped grinding stone with flat face resulting from use is virtually a pan-Eskimo tool. There is, therefore, no point in making detailed comparisons. However, the single grinding stone, elongated and square in section, from the Kugok Burial Site has a significant form, as it is that common to the whetstones of the Okvik, Ipiutak, and Old Bering Sea cultural phases.[2]

FLINT FLAKERS

The Point Barrow people were still making flint tools when Ray's party was there, and Murdoch gives a good description of the tool and the process used.[3]

UTKIAVIK-NUWUK: Flaker handles from the recent sites are remarkably uniform and are identical with those described by Murdoch (Fig. 53i). These are usually made of antler and

[2] Rainey, 1941, Fig. 33, Item 5; Larsen and Rainey, 1948, 86, Pl. 10, Fig. 7; Collins, 1937, 154, Pl. 43, Figs. 1–5.

[3] Murdoch, 1892, 287–289, Figs. 279–281.

vary in length from 9 to 18 cm. The butts curve to form an angle with the shaft and splay out to a wide flat surface against which the hand can rest. In the top of the handle, extending to the distal end, there is a narrow groove into which the flaker point is fitted. The point is lashed securely in place. Some of these tools have a raised ridge at the end to prevent the lashing from slipping off.

Flaker points consist of rods of hard bone 7 to 12 cm. long and about 1 cm. thick (Fig. 53h). The points from Nuwuk and Utkiavik in cross-section tend to be higher than they are wide. The ends are blunt and rounded. The provenience of handles and points is listed in Table 5.

NUNAGIAK: Only one point for a flaker was found at Nunagiak (Table 5). This conforms more to the variety of flaker points described below from Birnirk than to the recent type.

NUVUWARUK: A complete flaker was found at this site (Fig. 55k). The handle is of antler, and the harder bone point has the shape of the points from Birnirk described below.

BIRNIRK: Flaker handles from Birnirk (Fig. 55 l) are very similar to those from Utkiavik. One is made of wood; the remainder are of antler. The only difference between these tools and the later types from Utkiavik and Nuwuk is in the form of the point. Flaker points from Birnirk are also bone rods between 8 and 13 cm. long, but, in contrast to the later points, these in section are wider than high. As a result the working tip is wedge-shaped rather than rounded.

COMPARISONS: Flaker handles with the same method of attachment of the point and with bent but not splayed grips are found at the Okvik Site on Punuk Island. Rainey's illustration of the flaker points is not conclusive, but apparently the tips are wedge-shaped as are the Birnirk examples.[1] Only flaker points were found in the Old Bering Sea Period deposits at Gambell, St. Lawrence Island, and these resemble the Birnirk points.[2]

Giddings notes that the two-part flaker is represented in all periods along the Kobuk River. Points from the Ekseavik and Old Kotzebue sites (1400 A.D.) are flat and wedge-shaped, similar to those from Birnirk.[3] Judging from the illustrations, the point from Ambler Island (1730 to 1760 A.D.) has a rounded blunt point similar to that of the specimens from Utkiavik.[4]

TABLE 5

FLINT FLAKER HANDLES AND POINTS

Location	Points	Handles
Utkiavik		
Over House A	2	—
Floor of House A	2	—
House B	—	2
Location X	1	1
Purchased	1	7
Nuwuk, purchased	11	2
Nunagiak, Cut 2, Section 2	1	—
Birnirk		
Mound A		
Cut 4, 0–18 inches	1	—
20 inches below Structure C	1	—
Below Structure D	1	—
Floor of Structure E	1	—
Mound C, floor of House A	1[a]	—
Mound R, floor of House A	1	—

[a] Complete.

Flint flaker handles, rather common in the Ipiutak find, are divided into three closely related forms.[5] The most common, Type 1, is curved and has a spatulate butt. For the later periods at Point Hope, Larsen has noted the same distinction between early and recent flaker points as I have and has expressed it rather better. The Ipiutak points are similar to those from Birnirk.

Mathiassen illustrates what seems to be the point for a two-part flaker from Naujan.[6] From the photograph it is impossible to decide to which group this specimen is related.

BOWDRILLS

The bowdrill was an important tool when Murdoch wrote on the Point Barrow Eskimo.[7] These drills are still to be found in some tool kits. The bearing of the modern drill is usually made of a pitted stone set into a wooden mouthpiece that may have crescent-shaped wings that fit against the cheek. The round spindles, made

[1] Rainey, 1941, 508, Fig. 20, Items 12–15.
[2] Collins, 1937, 163, Pl. 47, Figs. 18–20, Pl. 30, Figs. 9–11.
[3] Giddings, 1952, Pl. 13, Fig. 10.
[4] Giddings, 1952, Pl. 4, Fig. 20.
[5] Larsen and Rainey, 1948, 93–95.
[6] Mathiassen, 1927a, Pl. 34, Fig. 9.
[7] Murdoch, 1892, 175–182, Figs. 149–159.

of wood, vary between 30 and 40 cm. in length and now have metal points, usually a nail with a flattened tip. The drills are spun by means of short bows or by a length of line with pulls on the ends.

UTKIAVIK-NUWUK: In the description of men's knives from Utkiavik and Nuwuk it was noted that many handles of all types have rounded pits as a result of their use as drill bearings. However, the wooden mouthpieces with bearings of harder material, described by Murdoch, were also in use. A small rectangular fragment of antler with rounded pit from the fill over House A, Utkiavik, is a mouthpiece bearing. A wooden mouthpiece with bearing missing is in the purchased collection from Utkiavik (Fig. 84d).

Drill spindles are round, from 1 to 2 cm. in diameter, tapering towards the bearing end. In the opposite end is a slot into which the point fits, and sometimes a raised lip has been carved to prevent the lashing from slipping. Lengths range from 12 to 30 cm. (Fig. 84a–c). One spindle has a constricted mid-section (Fig. 84a), as do two of the spindles illustrated by Murdoch.[1]

Drill points of stone were the only type found (Fig. 84f–h). Most of them are identical to the forms secured by Murdoch: slender, chipped, gray flint rods. One ground point is made of Kobuk jadeite. A bone point in the collection purchased from Utkiavik is shown in Fig. 84i.

NUNAGIAK: Few bowdrill parts come from Nunagiak (Table 6). A complete spindle with a bone point and a separate bone point were obtained from the older deposits beneath Mound C. These resemble the spindles and points from Birnirk, described below. Three stone points, identical to those described from Utkiavik, were secured from recent deposits.

BIRNIRK: The bowdrill spindles from Birnirk (Fig. 85a, f), all made of spruce, are essentially similar to the simple spindles from Utkiavik, but are markedly shorter. They range from 19 to 28 cm. in length, with diameters from 1.5 to 2 cm. In the complete specimen shown in Fig. 85g a bone point is lashed in place with braided sinew.

The usual bearing for the spindle was a deer astragalus which has a natural rounded pit that serves this purpose very well (Fig. 84e). Odd scraps of bone or antler were sometimes also used, but it was not customary to use knife handles for this purpose, as at the later sites.

Drill bits made of the proximal end of a seal fibula, usually trimmed at the articulation so that it would better fit into the slot in the spindle, are rather common in the ruins (Fig. 85c–d).

The slender piece of antler shown in Fig. 84b is possibly a bow for the drill. It is only 22 cm. long and may have served as a bucket handle.

COMPARISONS: Ivory bearings designed to be held in the mouth and ivory drill points were found at the Okvik Site.[2] Similar mouthpieces came from the Hillside Site at Gambell on St. Lawrence Island and continued in use through the Punuk Period.[3] However, the usual drill rest for the Old Bering Sea and Punuk periods of the Bering Strait Region is a large piece of ivory, often a wedge or other big tool, which must have been held in the hand.[4] Drill shafts and seal fibula points identical with the Birnirk specimens were common in the Old Bering Sea Period deposits in the Miyowagh Site.

The bowdrill is inferred for all the cultural stages on the Kobuk River, but the evidence is clearest in the two most recent sites. Bows were flexible and made of wood.[5]

Apparently the bowdrill was not used by the people of the Ipiutak cultural phase. Twenty-two flint tools are classed as drill points, but they were evidently not hafted in any way.[6]

Bowdrill parts are common in the Thule Culture sites reported by Mathiassen. Caribou astragali are commonly used for bearings. Another variety of bone mouthpiece is designed to be held in the teeth. The drill spindles resemble those from Birnirk; they are short, tend to be cylindrical, and have sockets into which the bits are lashed. Thule Culture drill points, frequently four-faceted, are usually of stone, slate, flint, or jade and are ground into shape.[7]

The Birnirk type of bowdrill can readily be derived from the Old Bering Sea form. That the same seal bone was chosen is particularly striking. The recent preference for stone points

[1] Murdoch, 1892, Figs. 149, 159a.

[2] Rainey, 1941, Fig. 20, Items 6–8.
[3] Collins, 1937, 236.
[4] Collins, 1937, 162.
[5] Giddings, 1952, 75.
[6] Larsen and Rainey, 1948, 105.
[7] Mathiassen, 1927b, 79–82.

TABLE 6

BOWDRILL PARTS

Location	Wood Mouthpieces	Deer Astragali	Spindles	Bone Points	Stone Points
Utkiavik					
Over House A	1	1	2	—	2
Floor of House A	—	—	1	—	4
House B	—	—	1	—	—
Purchased	1	—	—	—	7
Nunagiak					
Mound C					
Find 1	—	—	—	1	—
Entrance D	—	—	1	—	—
Mound H, Cut 6, Section 1	—	—	—	—	3
Birnirk					
Mound A					
Cut 2, Section 2	—	—	—	1	—
Cut 2, Section 4	—	—	—	1	—
Cut 3, Section 2	—	—	—	5	—
Cut 3, Section 5	—	—	—	1	—
Cut 3, Section 7	—	1	1	1	—
Cut 12, 0–12 inches	—	—	—	2	—
Floor of House A	—	—	1	1	—
Below Structure B	—	—	—	1	—
Floor of Structure C	—	—	—	1	—
Below Structure C, 10–20 inches	—	1	—	1	—
Floor of Structure E	—	—	—	1	—
Floor of Structure F	—	—	—	2	—
Mound C, floor of House A	—	1	—	1	—
Mound D, Cut 7, Section 1	—	—	—	2	—
Mound G, Cut 8, Section 2	—	—	—	3	—
Mound J					
Cut 13, Section 2	—	—	—	3	—
Floor 1 of House A	—	1	—	1	—
Floor 2 of House A	—	—	—	1	—
Mound R, floor of House A	—	—	—	1	—

at Point Barrow may be a result of the westward spread of Thule Culture items as so often postulated.

Distribution of the bowdrill in North America has been discussed by De Laguna.[1]

FIREMAKING EQUIPMENT

Murdoch wrote that "Fire is usually obtained nowadays by striking a spark in the ordinary method from a bit of flint with a steel, usually a bit of some white man's tool."[2] He continues by stating that the widespread Eskimo techniques of striking together iron pyrites and the use of the rotary firedrill were still remembered.

UTKIAVIK: Roughly rounded lumps or fragments of lumps of pyrites, about 2 cm. in diameter, were excavated: one in House B and one in Cut 2, Section 2. Four were in the purchased collection. Apparently the almost perfectly round shape was attained by the constant turning in the fingers as the implements were used. I am not sure whether a spark was produced by the striking of two lumps of pyrites together, as Murdoch has stated or, as is more probable, that a piece of flint was used with the pyrites striker.

[1] De Laguna, 1947, 169–171.
[2] Murdoch, 1892, 291.

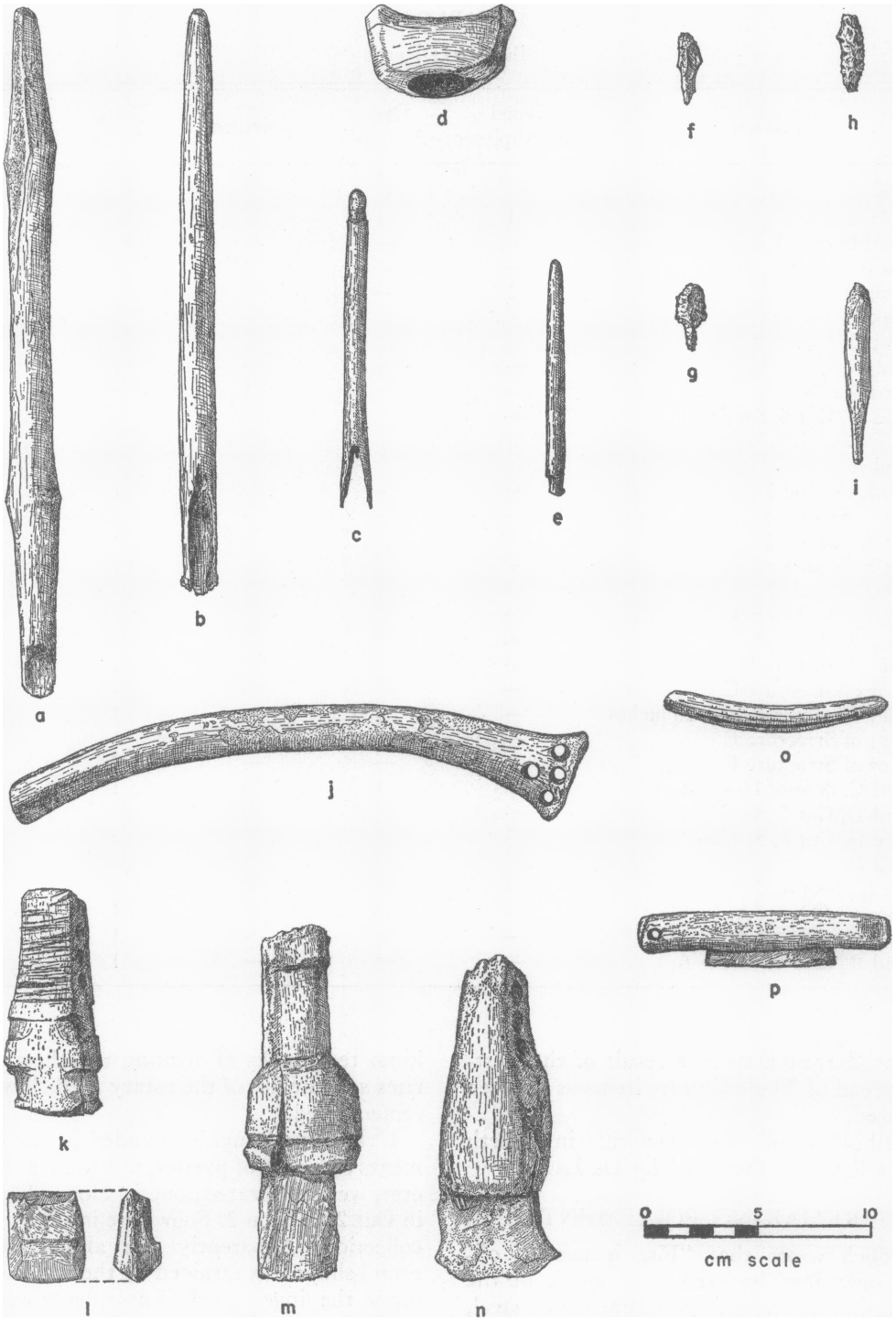


FIG. 84. Drill and adze parts from Nuwuk and Utkiavik. a–c, e. Bowdrill spindles. d. Wood drill mouthpiece. f–h. Chipped flint drill points. i. Bone drill point. j. Antler adze handle. k. Adze socket piece with lashing holes. l. Stone adze blade for cutting bone. m. Adze socket piece with sharp stone blade for cutting wood. n. Adze socket piece with iron blade. o–p. Baleen shaves; p has slate blade in place.

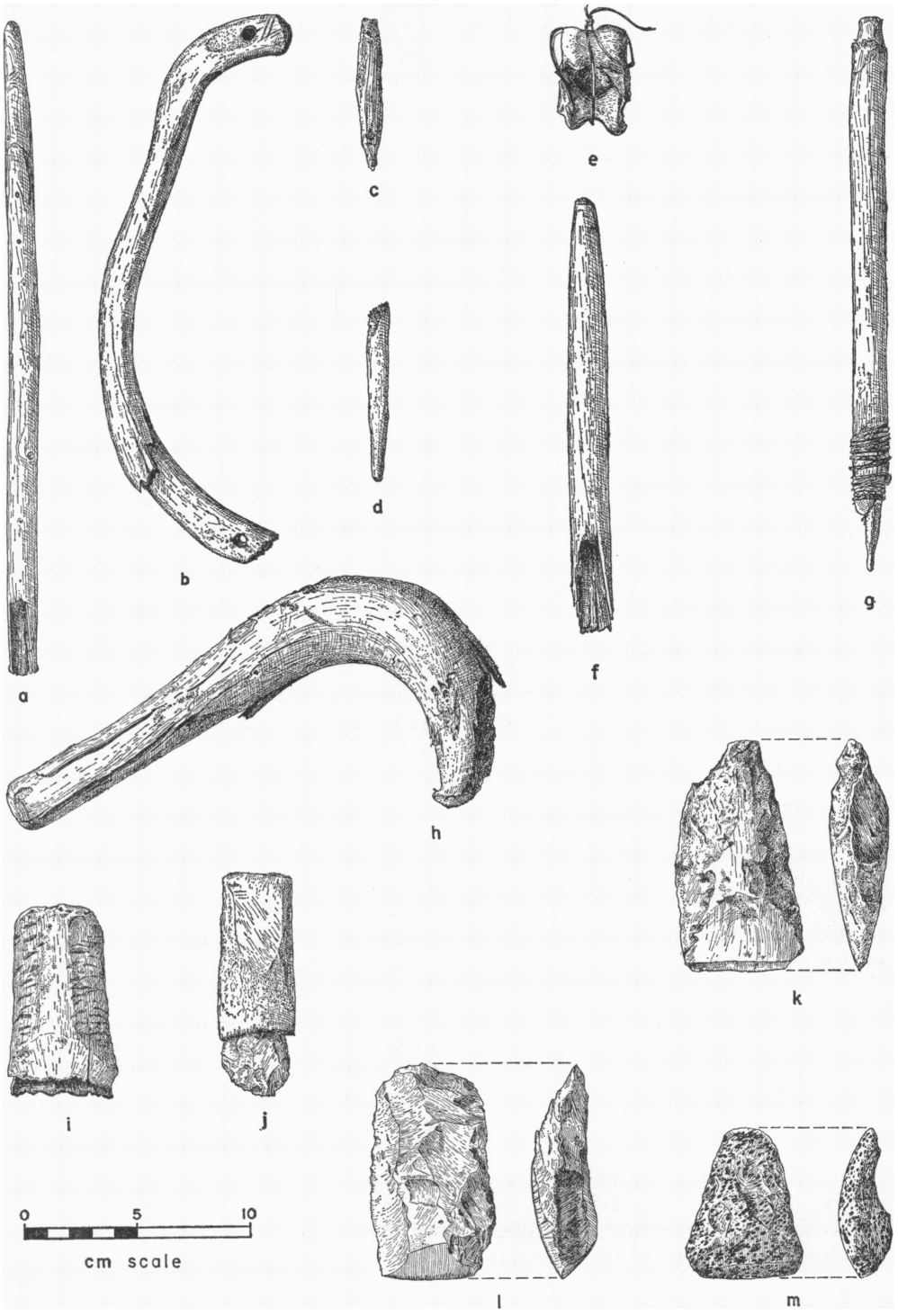


FIG. 85. Drill and adze parts from Birnirk. a. Bowdrill spindle. b. Antler bow. c–d. Stone and bone drill points. e. Deer astragalus used as drill bearing. f–g. Drill spindle and complete spindle with bone point. h. Wood adze handle. i. Antler socket piece. j. Socket piece with chipped stone blade. k–m. Stone adze blades.

Only one firemaking spindle is in the collection, and this was purchased. The charred tip is rounded, and the shaft tapers towards the bearing end as in most of the drill spindles from Utkiavik.

NUNAGIAK: A single firedrill spindle, charred on both ends, was found at Nunagiak, in Section 4, Cut 4.

BIRNIRK: An unshaped fragment of pyrites from the floor of Structure E, Mound A, suggests that this material may have been used in firemaking as early as the Birnirk Period.

Two firedrill spindles were found, both in Mound A (Cut 3, Section 7, and the floor of House A). Except for the rounded and charred ends they are similar to the other Birnirk drill spindles.

COMPARISONS: All Eskimo in historic times made fire by drilling and by the strike-a-light method. The drilling method extends back in time at least to the Okvik Culture of St. Lawrence Island,[1] and continued through subsequent cultural stages in that area.[2]

A pyrites ball 2 cm. in diameter was found at the earliest of the Kobuk River sites, Ahteut (1250 A.D.).[3] Direct proof of the use of the firedrill is lacking on the Kobuk, but it seems very probable that it was also used there.

Finds of pyrites were frequent enough in houses of the Ipiutak Culture at Point Hope for one to be certain that this method of firemaking was employed. Larsen and Rainey are of the opinion that the drill method probably was not known.[4]

Both methods of firemaking were used by the Thule Culture people in the Central Region.[5] The positive evidence for drilling and the single piece of pyrites from Birnirk, as well as the more certain evidence from Ipiutak, present the possibility that these traits may have been derived from Alaska.

ADZES

While Murdoch's evolutionary series of adze forms at Point Barrow is unconvincing, his descriptions as usual are excellent.[6] His collection included iron hatchets lashed on to handles to serve as adzes, also bone and antler socket pieces with both grooves and holes to receive lashings, with either iron or jade blades. Apparently metal had recently replaced jade blades.

UTKIAVIK-NUWUK: Adze handles from Utkiavik are usually made of antler and range in length from 10 to 28 cm. (Fig. 84j). In every respect they conform to the handles illustrated by Murdoch.[7] They have several lashing holes for the binding of the adze socket piece against the flat end of the handle. Usually the handle has a curve that makes it more convenient to grip and often a knob on the end to prevent the hand from slipping off. The socket pieces in the collection (Fig. 84k, m–n) are also similar to those illustrated by Murdoch. Usually made of bone, they have either a socket to receive the blade or, less often, a seat into which the blade was secured by a lashing. Most of these socket pieces were for stone blades. In Table 7 the socket pieces are listed in two groups according to the method of attachment to the handles which are provided with either a broad groove (Fig. 84m) or with drilled holes (Fig. 84n). Thirteen of the purchased heads from Utkiavik have the holes drilled from the front to the back side of the head, the variation that Murdoch placed latest in his developmental sequence. In the others the holes are drilled transversely.

Stone adze blades from Utkiavik are usually made from Kobuk jadeite or, more properly, nephrite, a material that the Eskimo of the Kobuk River began to quarry and trade extensively after 1400 A.D.[8] The stone blades are roughly triangular and generally are better smoothed towards the blade edge than on the socket end. The adze blades can be divided into two classes on the basis of their edges. In one group the rather sharp blade edge with the ground facets meets at an angle of about 30 degrees. These adzes were presumably used to cut fairly soft material such as wood. The second group has well-formed cutting edges on which the ground facets meet at an angle of about 90 degrees. These blades were probably intended for working hard materials such as bone, ivory, or antler.

NUNAGIAK: The adze socket pieces from

[1] Rainey, 1941, 550.
[2] Collins, 1937, Pl. 84, Fig. 1.
[3] Giddings, 1952, 73, Pl. 20, Fig. 8.
[4] Larsen and Rainey, 1948, 111–112.
[5] Mathiassen, 1927b, 109.
[6] Murdoch, 1892, 165–172.
[7] Murdoch, 1892, Figs. 128–142.
[8] Giddings, 1952, 64–80.

Nunagiak are from late deposits and compare directly with the types described from Utkiavik. The stone blades are from the earlier deposits in Mound C and from the beach below Mound C. Both sharp- and dull-edged forms were found, but it probably is significant that, while several varieties of fine-grained hard stone were used, none is made of Kobuk jadeite.

BIRNIRK: The Birnirk adze type is unique in Eskimo prehistory (Figs. 85h–m, 86). All the

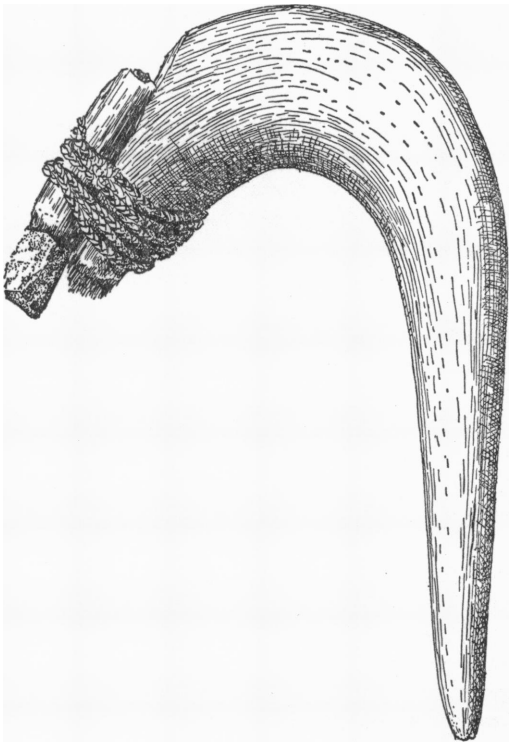


FIG. 86. Complete adze from Birnirk. This has wood handle, antler socket piece, and blade of igneous stone. Note angle of cutting edge.

specimens in the present collection have the same features as those collected by Van Valin and illustrated by Mason.[1] The handles, from 19 to 26 cm. long, have a smooth curve forming an arc of almost 90 degrees in front of the hand grip. Two of the handles were made of selected pieces of wood that curved naturally; the antler handle and the one of musk-ox horn also took advantage of naturally curved sections. The handles are round in section; their diameter is greatest in the curve, tapering towards the hand grip. The complete adze (Fig. 86) has a flattened grip with a hole for hanging the tool when not in use. The socket piece rests against a flat face; a lip on the opposite side of the handle prevents the lashing from sliding off. The lashing on the complete specimen is of braided sinew.

Socket pieces from Birnirk are remarkably simple compared to other Western Eskimo specimens (Fig. 85i–j). They are short, straight sections of antler, with a socket for the stone blade. The antler surface is generally roughened to prevent the lashing from slipping.

None of the adze blades from Birnirk is made of the green stone from Jade Mountain on the Kobuk River. Tough, fine-grained stones were used, but these are hornblendes or similar metamorphic rock. Some blades are chipped without grinding, but most of them have been polished near the cutting edges. As at Utkiavik, two varieties of edge are found, sharp and dull (Fig. 85k–l; Table 7). The dull-edged blades are always straight; some of the sharp-edged tools, however, are curved like a gouge. Most blades are small and triangular and obviously were hafted in sockets. A few stone blades are rectangular and are large enough so that they may have been attached directly to handles without the use of socket pieces (Fig. 85 l).

COMPARISONS: Adze blades with both beveled and sharp cutting edges very similar to those described from Birnirk are an element of the Okvik[2] and Old Bering Sea cultural stages.[3] From Old Bering Sea, through the Punuk Period in the Bering Strait Region, the stone blade was usually lashed into a bed in the socket piece. However, the socket piece and handle, although more elaborate, are essentially like those of the modern Point Barrow specimens: the handles straight, with lashing holes for attachment. The socket piece fits at a right angle to the handle.[4]

In a thorough discussion of the distribution

[1] Mason, 1930, Pl. 3.

[2] Rainey, 1941, Fig. 33, Items 1–3.

[3] Collins, 1937, 152–155. Collins describes the blunt, beveled blades as "adzlike scrapers." On the basis of a specimen with one sharp and one dull edge, he argues that these blades were not hafted but held in the hand. It is clear from finds such as the complete adze shown in Fig. 86 that the Old Bering Sea specimens are a variety of adze blade.

[4] Collins, 1937, 333–334, Pl. 46, Figs. 3–5.

TABLE 7

ADZE PARTS

Location	Blades		Sockets		Handles	
	Dull	Sharp	Drill	Groove	Birnirk Type	Utkiavik Type
Utkiavik						
Above House A	2	1	3	2	—	1
House B	—	1[a]	1	—	—	—
Cut 2, Section 1	—	—	1	—	—	—
Cut 2, Section 2	—	1[b]	—	—	—	—
Cut 2, Section 6	1	—	—	—	—	—
Purchase	5	6	20	13	—	13
Nuwuk, purchase	—	—	6	—	—	1
Nunagiak						
Cut 1, Section 1	—	—	—	—	1	—
House G	—	—	—	—	1	—
Mound C						
Above Punuk house	1	1	—	—	—	—
Miscellaneous from beach	1	1	—	—	—	—
Mound H						
Cut 6, Section 1	—	—	—	—	2	—
Cut 6, Section 2	—	—	—	—	1	—
Birnirk						
Mound A						
Cut 3, Section 7	1	—	—	—	—	1
Cut 4, over House A	1	—	—	—	—	—
Roof of House A	1	—	—	—	—	—
Floor of entrance, House A	1	—	—	—	1[c]	—
Structure B	—	—	—	—	1	—
Below Structure C	—	1	—	—	—	—
Structure E	1	1	—	—	—	2
Structure H	1[d]	—	—	—	1	—
Mound J						
Cut 13, Section 2	—	1	—	—	—	—
Floor 1 of House A	1	—	—	—	—	—

[a] Jade.
[b] Slate.
[c] Complete, with dull blade.
[d] In Birnirk Type socket.

of adze types, De Laguna has concluded that both the variety of adze in which the right angle is formed by the lashing of the handle against the side of the socket piece and the "elbow handles" essentially similar to those found at Birnirk are old forms with wide distribution in northern Asia and North America.[1]

However, the immediate source for the elbow handles in the Birnirk Culture is not apparent. In the most common form of adze of the Ipiutak Culture at Point Hope the stone blade is set in an antler or bone socket piece.[2] This socket piece which is lashed on to the end of the handle at right angles to it is essentially similar to the recent Point Barrow type. A second variety, with lashing slots to hold the socket piece at right angles to the handle, resembles one of the Old Bering Sea forms. The third type, represented by only one specimen, is quite similar to specimens from Utkiavik. The two adze handles found were made for attachment to socket pieces at right angles. Both the dull and beveled and the sharp blades occur at Ipiutak.

Adzes from the Thule Culture sites described by Mathiassen are similar in all respects to those described from Utkiavik; so similar that it may very well be true, as De Laguna has sug-

[1] De Laguna, 1947, 154–162.
[2] Larsen and Rainey, 1948, 84–86.

gested, that the recent adzes in the Point Barrow Area were derived from the Thule Culture of the Central Region.[1]

BALEEN SHAVES

Murdoch describes small knives, similar to the spoke shaves of the horse-and-buggy era, that were used at Point Barrow for cutting long, thin ribbons of baleen to be used as lashing.[2] He is doubtless correct in stating that these tools are peculiar to the Point Barrow Area in historic times.

UTKIAVIK-NUWUK: Three baleen shaves (Fig. 84p) were in the collection purchased from natives who dug in the ruins at Nuwuk. One of these has what seems to be the original slate blade in place. Two handles were made of bone; one is of wood. At Utkiavik a curved bone handle for a shave (Fig. 84o) was found in the fill over House A.

COMPARISONS: A specimen similar to specimens found at Point Barrow was collected by Rasmussen at the recent site on Barter Island.[3] Similar tools are not found at the older sites of Nunagiak, Birnirk, or at any of the archeological sites of the Bering Sea Region. Mathiassen found small ulu-like tools at Naujan, Aivilik, and Mitimatalik which he identifies as baleen shaves. Possibly they are, but the handles of these are not so long relative to blade edge nor do they curve as at Point Barrow. If Mathiassen's interpretation is correct, this tool may have developed in the Central Region and diffused to Alaska.

MATTOCKS AND PICKS

Mattocks made of bone and picks usually made of walrus tusk were in use when Murdoch wrote his description of Eskimo culture. The complete mattock that he illustrates is a section of whale rib about 45 cm. long, sharpened to a blade as wide as the bone will allow at one end.[4] A flattened face near the opposite end receives the end of the wooden handle, and above and below this are grooves for the lashing. The handle, about 60 cm. long, has a hole near the end for lashing.

Mattocks and picks are important tools for the building and maintaining of the semi-subterranean type of house. Their usefulness in the making of the original excavation is obvious. In the course of construction they are used to cut the blocks of sphagnum moss that are placed over the wooden structure to serve as insulation. The picks were also needed each fall when the families returned to their winter dwellings after a summer spent in tents. Water which collected on house floors and entry ways turned into ice with the first freezing weather, and this ice had to be broken and removed before the house could be re-occupied.

UTKIAVIK-NUWUK: Mattocks and picks exactly like those described by Murdoch are included in the collections from Utkiavik and Nuwuk (Fig. 87; Table 8). They range from 22 to 38 cm. in length. Both the mattocks and picks have two lashing grooves cut into the edges of the whale rib, but usually do not extend across the back. The exceptional pick shown in Fig. 87c has drilled lashing holes and is identical to the specimen shown by Murdoch in his Fig. 304b. All the tools are made of whale rib and, with the exception just noted, can be differentiated only by the shape of the point and by the tendency for rounder portions of ribs to be chosen for picks and flatter parts for mattocks.

The form of the complete tools is shown by toys (Fig. 87b, g). A portion of a full-sized handle (Fig. 87a) has the same type of hand grip as the handles of the toys.

NUNAGIAK: Mattocks and picks from Nunagiak are also made of whale rib. Those from the strata cuts conform in pattern to the tools described from Utkiavik. The tools found in Mound C are similar to the picks and mattocks described below from Birnirk.

BIRNIRK: The broad cutting edge of the majority of digging tools found at the Birnirk Site classifies them as mattocks (Table 8). A small proportion have shallow lashing notches in the edge of the rib so that these are indistinguishable from the tools found at Utkiavik. However, in the majority, deep notches extend from each edge of the rib completely across the back (Fig. 88d–e). Other differences are that the notches are frequently three in number rather than two as on the later picks, and the seats for the handle ends are more deeply cut. The picks and mattocks from Birnirk are on the average shorter than those at the later sites. Their average length is about 25 cm.

[1] De Laguna, 1947, 158.
[2] Murdoch, 1892, 173–174, Fig. 146.
[3] Mathiassen, 1930, 28.
[4] Murdoch, 1892, 302–304.

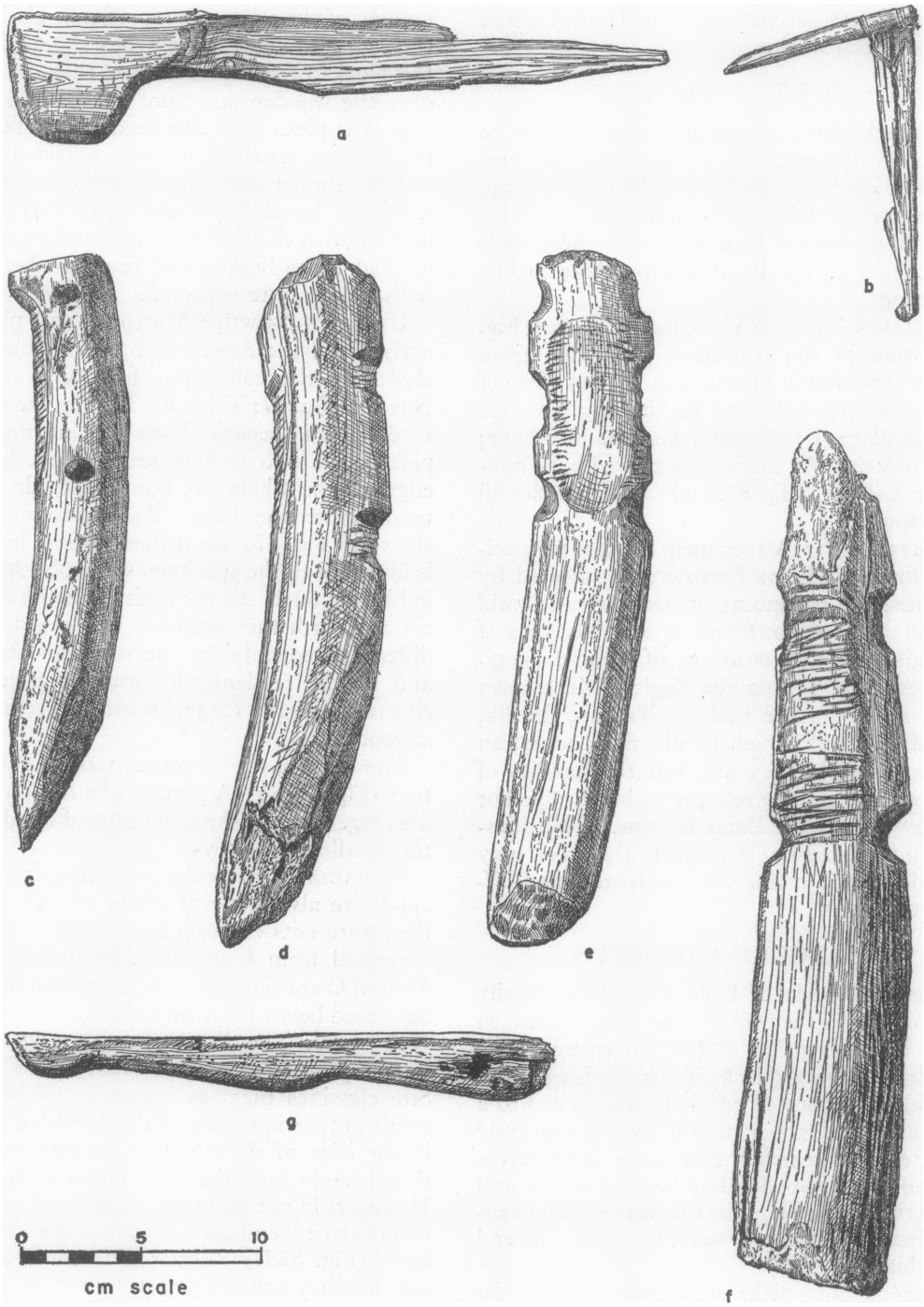


FIG. 87. Picks and mattocks from Nuwuk, Utkiavik, and Nunagiak. a. Fragment of pick handle. b. Complete toy pick. c–f. Pick and mattock heads made of whale rib. g. Handle for toy pick.

TABLE 8

MATTOCKS AND PICKS

Location	Picks	Mattocks	Handles
Utkiavik			
Cut 2, Section 6	—	—	1
Above House A	7	3	—
Cut 4, Section 2	—	1	—
Nuwuk, purchase	3	7	—
Nunagiak			
Cut 2, Section 1	1	—	—
Cut 2, Section 5	1	—	—
Cut 4, Section 2	—	1	—
Mound C			
Entrance D	2	2	1
Above Punuk house	—	3	—
Birnirk			
Mound A			
Cut 4	—	3	—
Cut 12, 0–12 inches	—	1	—
Floor of House A	—	4	—
Floor of Structure B	—	3	1
Below Structure B	—	4	—
Below Structure C	1	4	—
Floor of Structure E	2	3	—
Below Structure E	1	4	—
Floor of Structure H	—	3	—
Mound C, floor of House A	—	5	—
Mound J			
Floor 1, House A	—	2	—
Floor 2, House A	—	2	1
Mound O, miscellaneous	—	1	—

A badly preserved fragment of a wood handle with triangular hole for lashing is shown in Fig. 88a.

COMPARISONS: The digging tools of the Bering Strait Region were generally made of walrus tusk, doubtless because of the greater availability of these animals. The circular cross-section of the tusks provides little opportunity to design the tools as either specialized picks or mattocks. From the Uwelen Site, Rudenko illustrates two of these tools made of ivory; one has a broad groove 7 cm. wide to receive the lashing; the other has four deep grooves that were cut around three sides of the tusk.[1] Rainey illustrates tusk picks from the Okvik Site with one broad groove and with two or three narrow grooves.[2]

Ivory picks hafted in the same fashion are a feature of the Old Bering Sea stage. These seem to average about 24 cm. in length. In grooving and in the short length they resemble the Birnirk specimens.[3] The mattock blade made of whale rib is a rather featureless object.

Heavy picks and mattocks of the Ipiutak Culture are also predominantly made of walrus tusk and have the lashing groove features described for the early tools of this class from the Bering Strait Region, as well as the Birnirk specimens made of whale rib.[4]

Mattocks made of whale rib were found in the Thule Culture sites of Canada.[5] In some the end of the handle abuts against the blade, and

[1] Rudenko, 1947, Pl. 2, Figs. 29–30.
[2] Rainey, 1941, Fig. 22, Items 1–5.
[3] Collins, 1937, 161.
[4] Larsen and Rainey, 1948, 87, Pl. 22, Figs. 1–3, Pl. 44, Figs. 8–9.
[5] Mathiassen, 1927b, 78–79.

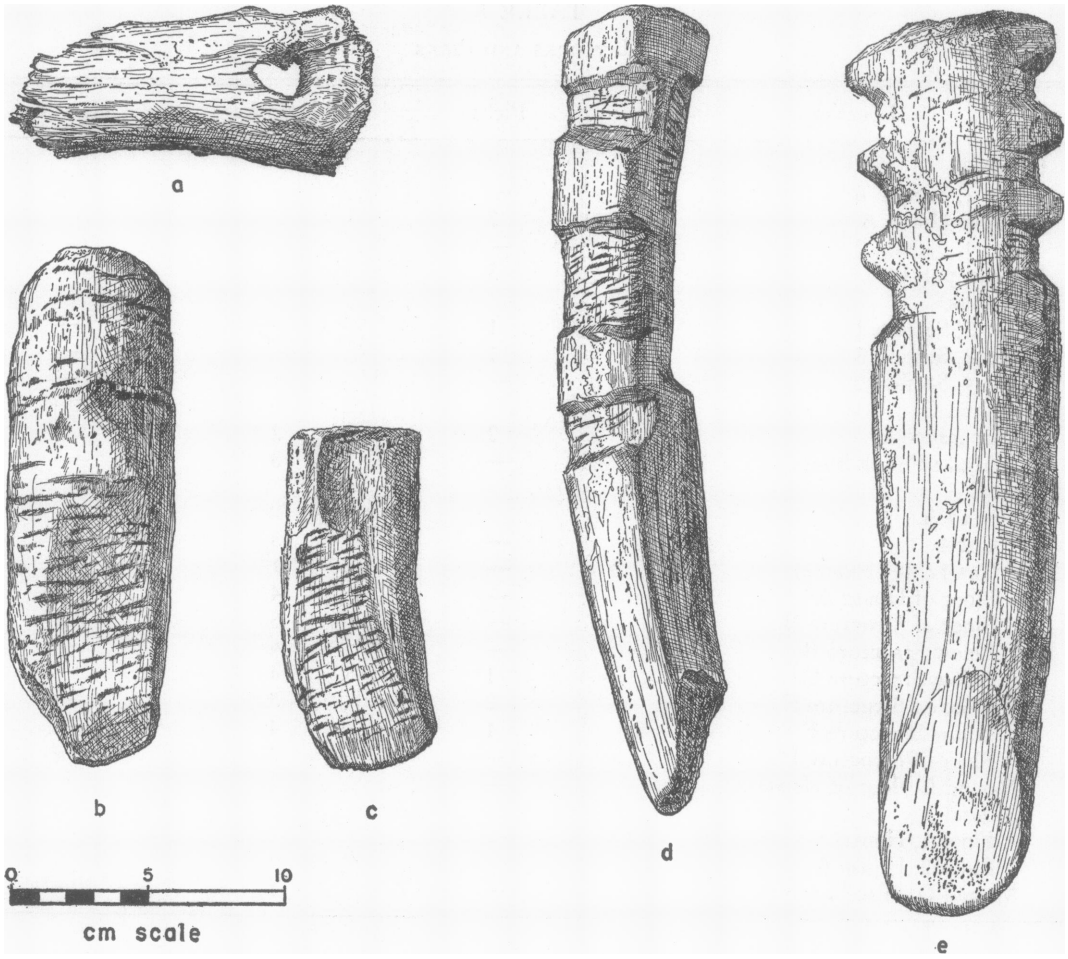


FIG. 88. Mattocks and bone wedges from Birnirk. a. Fragment of wood pick handle. b–c. Bone wedges. d–e. Mattock heads made of whale rib.

the lashings are held by notches in the edges of the rib, very much as in the specimens described from Utkiavik. In others holes are cut through, probably for the insertion of handles.

WEDGES FOR SPLITTING WOOD

The bone wedge for splitting wood is an ancient and widespread tool of the Eskimo. There is so little variation in shape that a detailed comparison hardly seems necessary. In the Bering Strait Region wedges are frequently made of ivory, but this merely reflects its abundance. In the Point Barrow Area wedges are usually made of sections of whale rib; smaller tools are occasionally made of antler. The blades of the wedges have been formed by chopping on both sides, apparently with an adze. Most of them show considerable battering on the polls (Fig. 88b–c).

Wedges from the several sites in the Point Barrow vicinity are listed in Table 9.

BLUBBER HOOKS

Blubber hooks, consisting of an ivory hook lashed to a wooden handle, were in common use when Ray's party was at Point Barrow and are still used.[1] They are very useful in the handling of the heavy and slippery cubes of blubber that are cut from whale carcasses. To the south, in the Bering Sea Region, similar hooks are used

[1] Murdoch, 1892, 310–311.

TABLE 9

WEDGES FOR SPLITTING WOOD

Location	Quantity
Utkiavik	
Above House A	30
Floor of House A	4
Cut 2, Section 3	1
Cut 2, Section 5	1
Purchase	7
Nuwuk, purchase	4
Nunagiak	
Cut 2, Section 1	1
Cut 2, Section 2	1
Cut 2, Section 6	1
Mound C	
Entrance D	1
Cache A	2
Above Punuk house	1
From beach	2
Birnirk	
Mound A	
Cut 3, Section 1	1
Cut 4	2
Roof of House A	1
Floor of entrance, House A	3
Below Structure B	1
Floor of Structure C	2
Below Structure C	4
Floor of Structure F	1
Below Structure F	1
Floor of Structure H	4
Mound C, floor of House A	3
Mound G, Cut 8, Section 5	1
Mound H	
Cut 9, Section 2	1
Cut 9, Section 7	1
Mound J	
Cut 13, Section 2	1
Cut 1, Section 1	1
Floor 1 of House A	1
Mound R, Floor of House A	1

as boat hooks,[1] but this implement does not seem to have been used in the Point Barrow Area.

UTKIAVIK-NUWUK: Blubber hooks of ivory or antler, identical to those illustrated and described by Murdoch, were obtained from both of the late sites (Fig. 89). The proveniences follow:

Utkiavik	
Over House A	3
Cut 2, Section 1	1
Cut 4, Section 2	1
Nuwuk, purchased	1

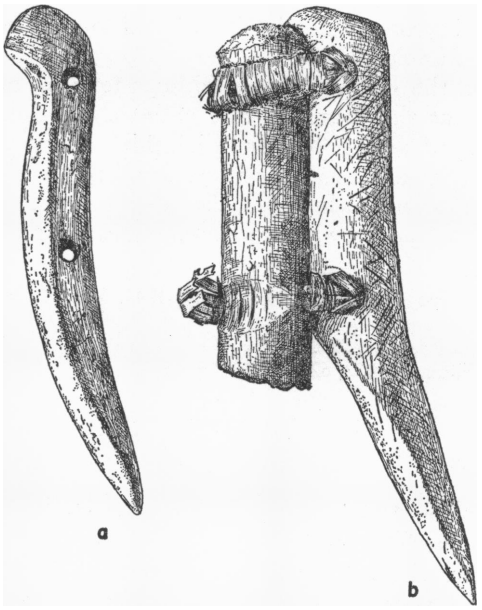


FIG. 89. Blubber hooks from Nuwuk and Utkiavik.

NUNAGIAK: There doubtless are blubber hooks to be found in the recent deposits at this site which are comparable in age to Utkiavik. However, none was encountered in my limited digging. The only boat hook found at Nunagiak was in the structures exposed in the beach beneath Mound C which yielded a number of objects with Punuk style of ornamentation (p. 61; Fig. 21p). This hook, made of ivory, conforms in shape to Collins' Type 4, a type confined to the Punuk Period on St. Lawrence Island.[2] The decoration consists of deeply incised lines and conforms to Collins' Style 2 on St. Lawrence Island.[3]

BIRNIRK: No evidence of blubber or boat hooks was found at Birnirk. Mason, in reporting on the work of Van Valin at Kugusugaruk, says that "Some (of the burials) held wooden drinking tubes in their hands and others blubber sticks."[4] This statement based on Van Valin's notes is somewhat ambiguous. There are no blubber hooks in the collection at the University Museum at Philadelphia.

COMPARISONS: It is rather strange that these tools are missing from the Birnirk Site, because several types occur rather abundantly in

[1] Nelson, 1899, 222–223.
[2] Collins, 1937, 139, Pl. 35, Fig. 6.
[3] Collins, 1937, 192, Pls. 65–66.
[4] Mason, 1930, 384.

St. Lawrence Island Okvik,[1] Old Bering Sea, and Punuk[2] stages.

On the Kobuk River Giddings found a boat hook at the Ekseavik Site (1400 A.D.). This is made of antler, has drilled lashing holes, and the butt extends over the end of the wooden shaft exactly as in the Utkiavik specimens.[3]

Large hooks with wooden handles are not an element of the Ipiutak cultural complex. Larsen and Rainey illustrate specimens from Tigara and modern burials at Point Hope.[4]

The Thule Culture of Central Canada also seems to lack the boat or blubber hook. This may be a consequence of the failure of this feature to diffuse from the Bering Strait Region to Point Barrow Area early enough to become an element of the Birnirk Stage and thus become incorporated in Thule as it developed from Birnirk.

[1] Collins, 1937, 138–139; Rainey, 1941, Fig. 17, Items 1–8.
[2] Collins, 1937, 227.
[3] Giddings, 1952, 62, Pl. 43, Fig. 16.
[4] Larsen and Rainey, 1948, Pl. 89, Fig. 29, Pl. 94, Fig. 13.

WOMEN'S TOOLS AND HOUSEHOLD EQUIPMENT

ULUS

In the 1880's the ulus, or women's knives, were made of steel handsaw blades as are most of these knives in use today. However, ground slate blades had only recently gone out of use, and Murdoch obtained a few "genuine antiques."[5] Fragments of slate ulu blades and their handles are among the most numerous artifacts encountered in the excavation of ruins in the Point Barrow vicinity.

Utkiavik-Nuwuk: The ulu handles from the two recent sites are usually made of bone or antler. Nearly all can be placed in three categories of shape. The most popular handles are shaped like a segment of an orange (Shape A), a half oval in outline, thick along the back of the handle, with the faces tapering to the narrow edge that has been slotted for the blade (Fig. 90a–b). Most of the handles have narrow slots that can have been used only for metal blades, probably pieces of steel saws (Table 10). These are similar to most of the ulu handles illustrated by Murdoch.[6] Handles of Shape B (Table 10) tend to be straight cylindrical rods of antler that are grooved along one face to receive the blade (Fig. 90e–f). Some grooves are narrow; others are wide enough to have received slate blades. Handles of the least popular third shape (C) are similar to the form described above as Shape A, but differ in that they are uniformly thin, with no thickening towards the back of the handle (Fig. 90c; Table 10).

One unusual handle made of whale bone is shaped like a capital D, with the blade slot along the straight side of the D (Fig. 90g). A small ulu, complete with iron blade, was probably used in sewing (Fig. 90d).

Slate ulu blades, usually fragmentary, are very common in the recent collections (Table 10). The blade edges always curve and were ground on both faces to produce sharp blades without edge facets. The backs of the blades, the portion inserted in the handle slot, are usually roughly chipped and not finished by grinding. There is generally a shallow notch at each end of the blade to mark off the tang that was inserted in the handle (Fig. 90h, j). Only one blade had drilled holes for lashings (Fig. 90i).

Approximately half of the ulu blades found at Nuwuk and Utkiavik are made of the dark, reddish, fine-grained slate that is mentioned above in the discussion of men's knives. The balance are usually made from the dark gray slate, the only type utilized by the earlier Birnirk people. A few blades were made of greenish slate and a light gray slate.

Nunagiak: The ulu parts found in the older sections of the Nunagiak Site correspond in every respect to the specimens secured from Birnirk; recent deposits yielded types resembling those from Utkiavik. Two complete ulus that accompanied Burial 1 in the Punuk Period House beneath Mound C are shown in Fig. 21c–d. These have wooden handles and blades of gray slate. The tangs of these blades are relatively narrow in relation to the length.

Birnirk: As is shown in Table 10, ulu handles and blade fragments were very common in the Birnirk ruins. The handles, all made of wood, are consistently of the form shown in Fig. 92a–c. The lengths range up to 17 cm.; the

[5] Murdoch, 1892, 161–165, Figs. 119–127.
[6] Murdoch, 1892, Figs. 119–121.

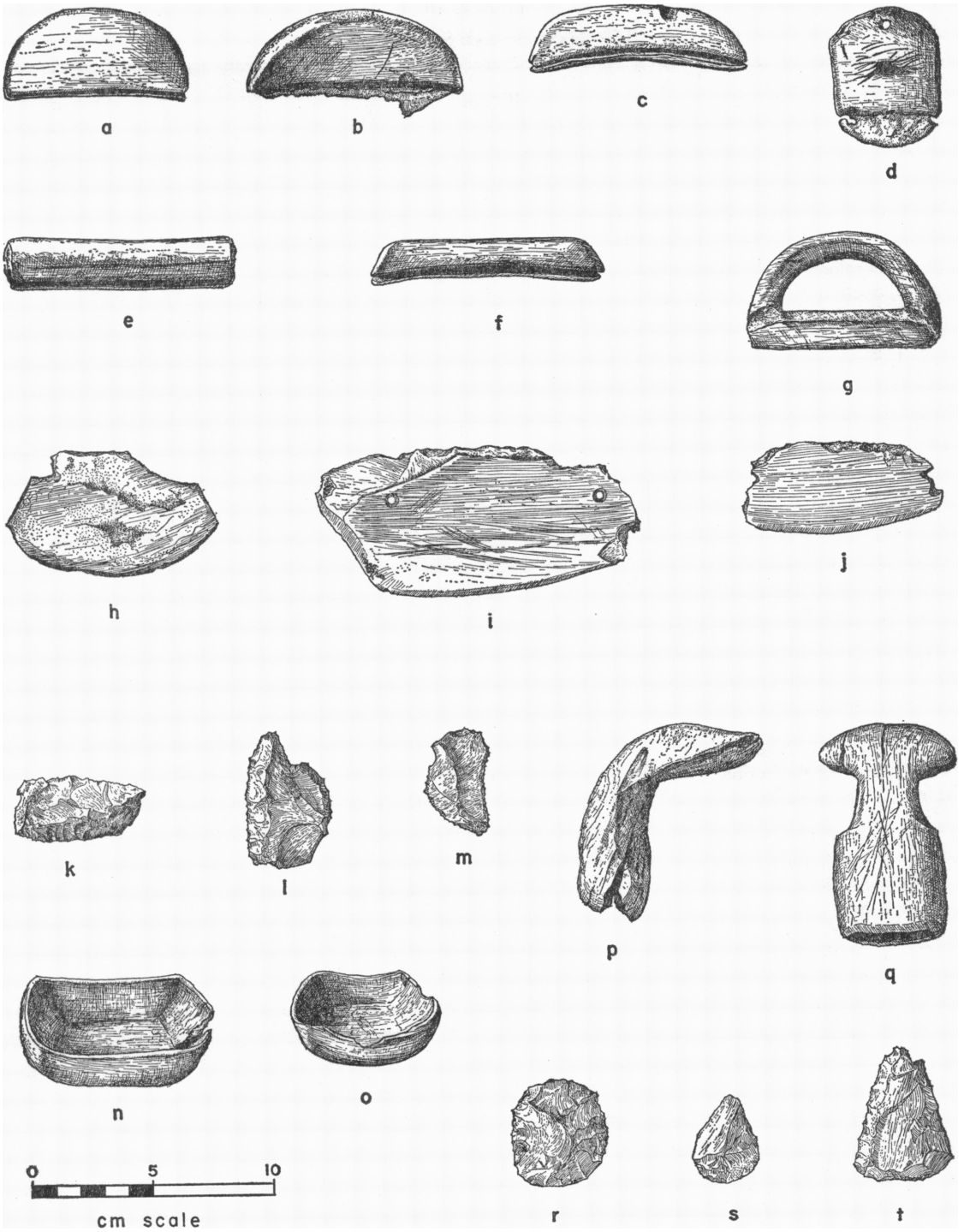


FIG. 90. Women's knives and scrapers from Nuwuk and Utkiavik. a–j. Bone ulu handles and slate blades. k–m. Chipped flint sidescrapers. n–o. Cup-shaped fat scrapers of bone. p–q. Wood skin scraper handles. r–t. Chipped flint endscraper blades.

TABLE 10

ULU HANDLES AND SLATE BLADES

Location	Blades	Handles A	Handles B	Handles C	Birnirk Type
Utkiavik					
Above House A	13	—	—	1	—
Floor of House A	3	—	—	—	—
House B	1	1	—	—	—
Cut 2, Section 1	4	—	—	—	—
Cut 2, Section 2	3	—	—	—	—
Cut 2, Section 3	1	—	1	—	—
Cut 2, Section 5	1	—	—	—	—
Location X	1	—	—	—	—
Cut 4, Section 2	1	—	1	—	—
Purchase	65	18	11	—	—
Nuwuk, purchase	75	4	2	6	—
Nunagiak					
Cut 1, Section 1	1	—	—	—	—
Cut 1, Section 2	4	—	—	—	—
House G	2	—	—	—	—
Cut 2, Section 2	1	—	—	—	—
Cut 2, Section 4	5	—	—	—	—
Cut 2, Section 6	2	—	—	—	—
Cut 4, Section 2	2	—	—	—	—
Cut 4, Section 3	2	—	—	—	—
Mound C					
Cache A	2	1	—	—	—
Structure E	1	—	—	—	—
Burial 1	1	1	—	—	—
Find 1	—	2[a]	—	—	—
Above Punuk house	2	—	—	—	—
Mound H, Cut 6, Section 2	1	—	—	—	—
Birnirk					
Mound A					
Cut 2, Section 1	5	—	—	—	—
Cut 2, Section 2	5	—	—	—	—
Cut 2, Section 3	2	—	—	—	—
Cut 2, Section 4	1	—	—	—	—
Cut 2, Section 6	1	—	—	—	—
Cut 3, Section 1	3	—	—	—	—
Cut 3, Section 2	3	—	—	—	—
Cut 3, Section 3	4	—	—	—	—
Cut 3, Section 7	—	—	—	—	3
Above entrance of House A, Cut 4	2	—	—	—	—
Cut 12, 0–12 inches	2	—	—	—	—
Ice crack, House A	1	—	—	—	—
Timbers between Structures A, E, and C	2	—	—	—	—
Roof of House A	3	—	—	—	—
Floor of House A	7	—	—	—	—
Entrance of House A	9	—	—	—	—
Floor of Structure B	3	—	—	—	—
Below Structure B	9	—	—	—	1
Floor of Structure C	6	—	—	—	1
Below Structure C	16	—	—	—	—

TABLE 10—(*Continued*)

Location	Blades	Handles A	Handles B	Handles C	Birnirk Type
Floor of Structure D	1	—	—	—	—
Below Structure D	4	—	—	—	—
Floor of Structure E, 1932	6	—	—	—	—
Burial 3	2	—	—	—	—
Structure E, 1936	15	—	—	—	3
Floor of Structure F, 1932	3	—	—	—	—
Mound C					
Floor of House A	4	—	—	—	3
Below floor of House A	2	—	—	—	1
Mound D					
Cut 7, Section 1	1	—	—	—	—
Cut 7, Section 3	1	—	—	—	—
Cut 7, Section 4	1	—	—	—	—
Mound G					
Cut 8, Section 2	1	—	—	—	—
Cut 8, Section 6	1	—	—	—	—
Mound H					
Cut 9, Section 5	1	—	—	—	—
Cut 9, Section 6	2	—	—	—	—
Cut 9, Section 7	1	—	—	—	—
Mound J					
Cut 13, Section 1	5	—	—	—	—
Cut 13, Section 2	4	—	—	—	—
Cut 13, Section 6	1	—	—	—	—
Cut 1, Section 1	1	—	—	—	—
Floor 1 of House	9	—	—	—	—
Floor 2 of House	5	—	—	—	—
Mound S					
Cut 6, Section 1	1	—	—	—	—
Cut 6, Section 2	5	—	—	—	—
Cut 6, Section 5	1	—	—	—	—
Mound R, floor of House A	5	—	—	—	—

[a] Complete with blade.

average is about 11 cm. Thickness is from 1 to 2 cm. The blade slots are wide enough to hold the average slate blade but do not extend the entire length of the handles; they received the definite tangs on the ulu blades of this period. As a precaution against their being split some of the handles have lashing grooves cut around both ends (Fig. 92c).

Ulu blades, as are all other slate tools from Birnirk, are made of a dark gray, fine-grained material. The red and green slate found at the later sites does not occur. Typically the blades have a curved cutting edge ground from both sides without facets or bevels. Rectangular notches are chipped on the back sides of the blades at each end to form the tangs that fitted into the slots in the handles (Fig. 92g–i). These tangs contrast with the shallow notches of the blades from Nuwuk and Utkiavik (Fig. 90h, j).

COMPARISONS: The majority of ulu handles from the Okvik Site on Punuk Island were made of ivory and were decorated. Otherwise they are comparable in outline to the Birnirk handles. One specimen made of wood is identical.[1] The slate blades illustrated for these knives do not seem to have tangs.

Ulus from the Hillside Site and Miyowagh on St. Lawrence Island are directly comparable to those from Birnirk. Most of the handles are made of wood and have a straight slotted edge

[1] Rainey, 1941, Fig. 19, Item 9.

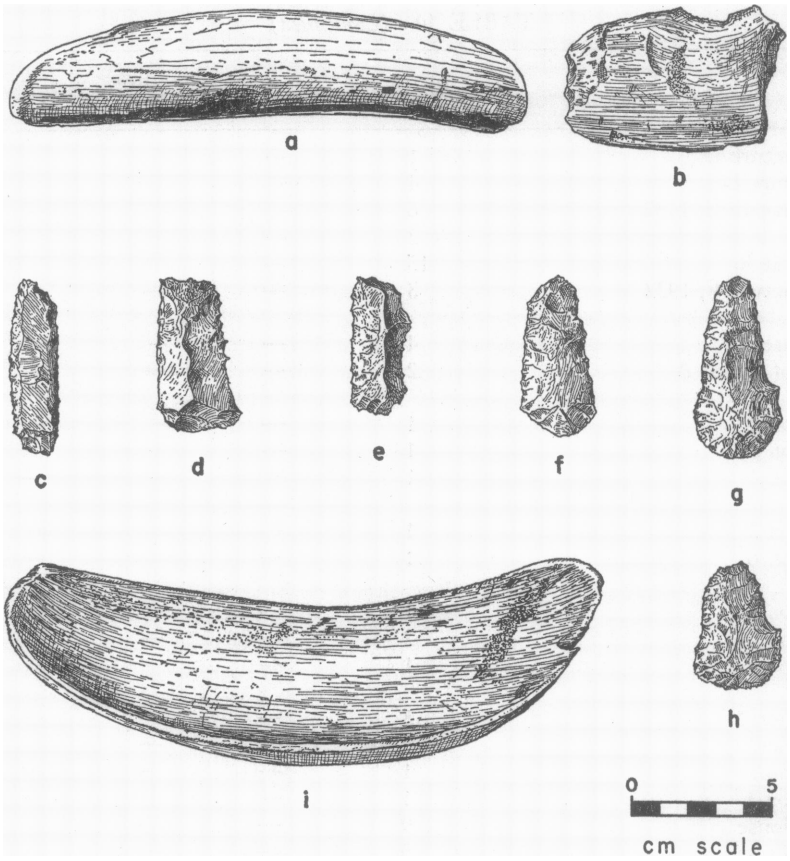


FIG. 91. Women's knives and scrapers from Nunagiak. a–b. Wood ulu handle and slate blade. c–e. Chipped sidescrapers. f–h. Chipped blades for skin scrapers. i. Cup-shaped fat scraper made of bone.

to receive the blades. They tend to be oval rather than crescentic in outline, and occasionally the ends are grooved for lashing to prevent their being split.[1]

Ulu blades from the early phase of the Old Bering Sea Period, unlike the Birnirk specimens, do not have marked tangs.[2]

At the Ekseavik Site (1400 A.D.) and the Intermediate Kotzebue Site (1550 A.D.) ulu blades occasionally had tangs[3]; most of the blades lacked this feature.

Larsen and Rainey illustrate the earliest tanged slate ulu blades from the recent Tigara Period at Point Hope.[4] However, their collection from the Birnirk Period at that locality is so limited that the absence of this feature cannot be considered significant.

The ulu handles from the Thule Culture sites in Central Canada, mostly made of whale bone or antler, are much more similar to the varieties from Nuwuk and Utkiavik than they are to those from Birnirk. The segment-shaped handle with thickened back and the almost cylindrical handle,[5] the two most popular forms at the late Barrow sites, are the common types from the earlier Naujan Site. The D-shaped handle, only one of which is in the present collection, is also popular (Fig. 90g).

Mathiassen, in his extensive discussion of the subject, convincingly argues that the ulus with T-shaped handles from the Central Region are a later development. (Mathiassen uses the term "Tanged Handle" which should not be

[1] Collins, 1937, 164, Pl. 51, Figs. 1–7.
[2] Collins, 1937, Pl. 39, Figs. 23–25.
[3] Giddings, 1952, 68, 71.
[4] Larsen and Rainey, 1948, Pl. 90, Figs. 27, 29.
[5] Mathiasssen, 1927a, 58–60, Pls. 23–24.

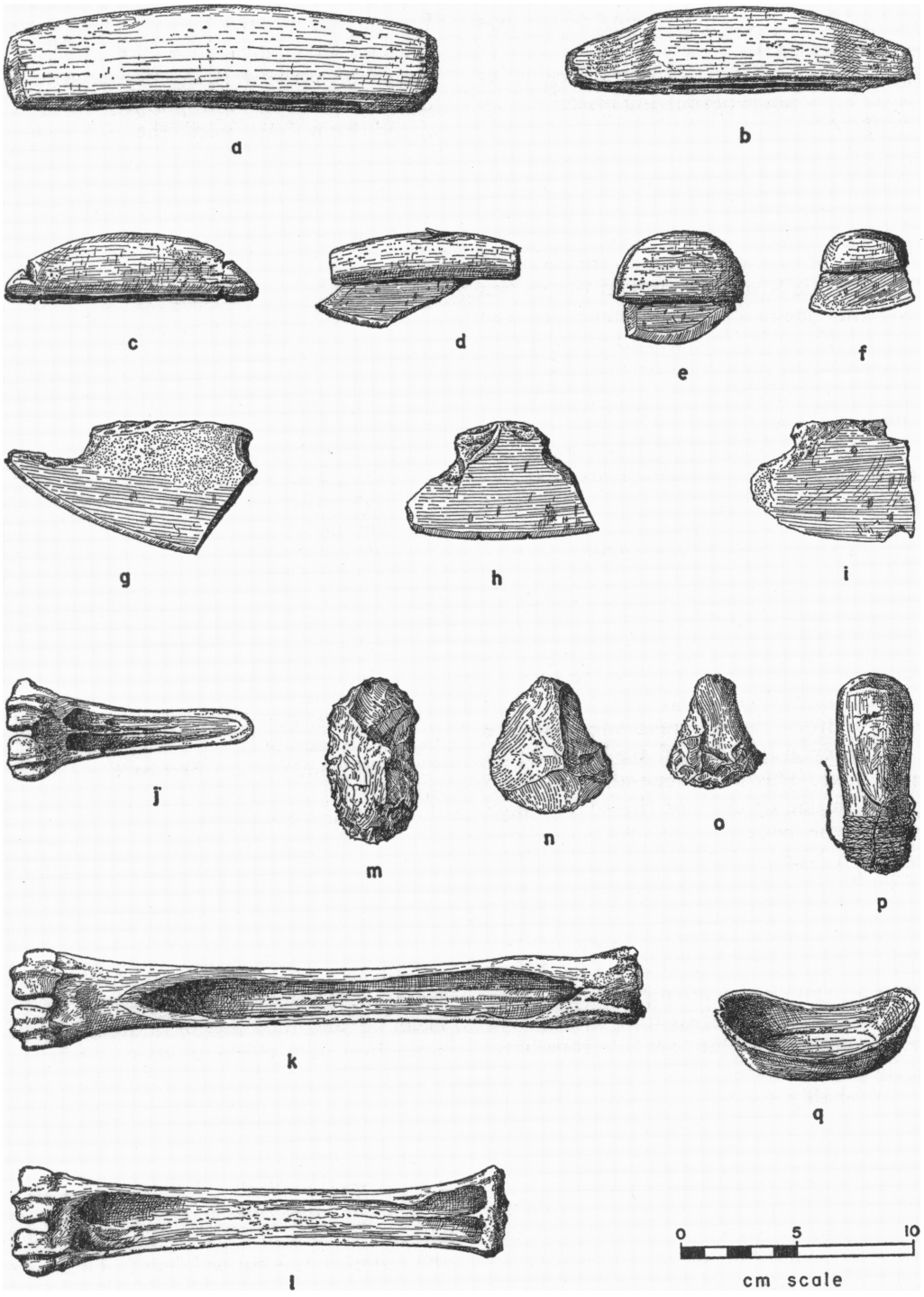


FIG. 92. Women's knives and scrapers from Birnirk. a–i. Wood handles and slate blades for ulus. j–l. Pointed scraper and beamers made of deer metapodial bone. m–o. Chipped flint end-scrapers. p. Bark handle for scraper. q. Ivory cup-shaped fat scraper.

confused with the preceding discussion of tangs on the slate blades.[1])

The slate blades from the Central Region infrequently have tangs permitting insertion into the handle slot as described for the Birnirk specimens. Pegs through drilled holes, however, are a more popular method of fastening the blade to the handles.

The foregoing comparisons suggest that the Birnirk type of ulu was derived directly from the Bering Strait Region on an Old Bering Sea or earlier time level. The resemblance between Birnirk and Thule is general rather than specific. However, the handle forms of the Central Region Thule, Utkiavik, and Nuwuk are virtually identical. These forms probably developed in the Central Region and returned westward with the resurgence of Thule Culture that has so often been postulated.

FLINT SIDESCRAPERS

Apparently flint sidescrapers were not used at Point Barrow when Murdoch made his ethnological collections; these were never very popular tools. No temporal change in the form is obvious; it is unnecessary, therefore, to compare the scrapers from the different sites. All are made of a waxy gray flint and are based on an elongated flake. This flake generally has steep retouching on one or more of the edges which are straight or convex (Fig. 90k–m). Four scrapers from Nunagiak have straight parallel sides (Fig. 91c–e). Otherwise there seems to be no consistent pattern to scraper form.

The edge retouching on these flakes appears to be intentional, but in addition tiny flakes have been broken off the cutting edges, leaving numerous minute hinge fractures. This is the usual result of using a flint chip to scrape hard substances such as antler or bone. These scrapers were probably used for this purpose and were not primarily skin-working tools. One scraper from Birnirk is oval in outline, flat on one side, and ridged on the other (Fig. 92m).

COMPARISONS: Sidescrapers made from flakes of chert are known from the Okvik Period on St. Lawrence Island[2] but are not common at a later date. Sidescrapers are an important element of the Ipiutak remains at Point Hope. Larsen and Rainey classify these steeply retouched flakes into three forms, depending on the shape of the working edge, as straight, concave, or convex.[3] The parallel-sided, straight-edged form lasts until the Thule Period at Point Hope,[4] and these tools resemble the four specimens from Nunagiak mentioned above. These scrapers do not seem to be an element of the Thule Culture in Canada.

TABLE 11

FLAKE SIDESCRAPERS

Location	Quantity
Utkiavik	
Above House A	2
Cut 4, Section 2	1
Purchase	3
Nunagiak	
Cut 2, Section 3	2
Cut 2, Section 4	1
Cut 2, Section 5	1
Cut 2, Section 6	1
Cut 4, Section 1	2
Cut 4, Section 2	1
Mound C	
Over Punuk house	2
Structure E	1
Mound H, Cut 6, Section 2	2
Birnirk	
Mound A	
Floor of Structure H	1

THUMBNAIL SCRAPERS AND HANDLES

Skin scrapers are very important tools for the women. Not only are they used for the original cleaning and tanning of hides, but also for softening skin clothing which stiffens when accidentally dampened. Murdoch describes scrapers with chipped flint blades that were in use when he collected at Point Barrow.[5] Today scraper points are usually of metal—commonly a short section of an old shotgun barrel.

Murdoch describes four varieties of handles, all elaborations of a broad handle curved to fit the palm of the cupped hand. These elaborations are various arrangements of pits in which to place the fingers.

[1] Mathiassen, 1927b, 84–89.

[2] Rainey, 1941, Fig. 32, Items 13–14; Collins, 1937, 150–151, Fig. 16.

[3] Larsen and Rainey, 1948, 105–108.

[4] Larsen and Rainey, 1948, Pl. 95, Fig. 14.

[5] Murdoch, 1892, 294–299.

TABLE 12

SKIN SCRAPERS

Location	Blade	Handle	Metapodial Beamer	Cup-shaped Fat Scraper
Utkiavik				
Above House A	3	—	2	—
Floor of House A	1	—	—	—
House B	5	—	—	—
Location X	1	1	—	1
Purchase	26	6	1	6
Nuwuk, purchase	25	—	—	1
Nunagiak				
Cut 1, Section 1	2	—	—	—
Cut 1, Section 2	1	—	—	—
Cut 2, Section 5	2	—	—	—
Cut 2, Section 6	4	—	—	—
Cut 4, Section 4	1	—	—	—
Mound C				
Miscellaneous from beach	1	—	—	—
Burial 1	—	—	1	—
Entrance D	—	—	—	1
Birnirk				
Mound A				
Cut 2, Section 3	—	—	1	—
Cut 2, Section 4	—	—	1	—
Cut 2, Section 5	—	—	1	—
Cut 3, Section 1	1	—	—	—
Cut 3, Section 7	—	—	1	1
Cut 12, 0–12 inches	—	—	—	1
Roof of House A	—	—	1	—
Floor entrance of House A	—	1	1	—
Floor of Structure B	—	—	1	—
Below Structure B	—	—	1	—
Below Structure C	—	—	1	—
Structure G	—	—	2	—
Mound C, floor of House A	1	—	2	—
Mound D, Cut 7, Section 4	—	—	1	—
Mound H, Cut 9, Section 1	1	—	—	—
Mound J, Floor 1 of house	—	—	1	—
Mound R, floor of house	—	—	1	—

UTKIAVIK-NUWUK: The number of scrapers found at the recent sites (Table 12) corroborates Murdoch's statement that "every woman owns one of these tools." The scraper blades are generally made of a waxy gray flint; a few are of red jasper. Nearly all were chipped from a large flake; the reverse side is formed by the fracture surface with little retouching (Fig. 90r–t); the upper surface is carefully chipped. The blade increases in thickness from the haft towards the working edge which is curved and formed by steep chipping to produce an angle of about 45 degrees. Most of the specimens are polished on the edge from use. About half of the blades from the recent sites are triangular in outline; half are circular. The blade widths range from 2 to 4 cm., and the length of the triangular blades from 4 to 6 cm.

The few handles recovered from these sites are of wood (Fig. 90p–q; Table 12) and conform to the simple variety described by Murdoch.

NUNAGIAK: Scrapers of the triangular shape described above were fairly common at Nun-

agiak (Table 12). One from Cut 2, Section 5, and four from Section 6 of this same cut have a peculiar outline, because the blade area is set off from the stem by a rounded but definite shoulder (Fig. 91g–h). These scrapers also differ in being flaked on both faces. In cross-section, however, they are similar to the scrapers that utilize the flake face for the obverse side. No scraper handles were found at Nunagiak.

BIRNIRK: In contrast to the later sites, only three stone scraper blades come from Birnirk (Table 12). These are triangular. The specimen from the floor of the house in Mound C, in particular, shows considerable smoothing of the working edge (Fig. 92n–o). It is possible that the rather common beamer scrapers were used for most of the work of dressing skins. The single scraper handle from Birnirk is made of bark (Fig. 92p). Its blade is missing, but the braided sinew lashing is in place.

Triangular or roughly rectangular chipped scraper blades based on flakes are found in the Okvik Period on St. Lawrence Island.[1] In every respect these resemble the triangular form in the Point Barrow Area. However, these tools seem to have disappeared by the Punuk Period.

Larsen and Rainey distinguish four types of endscrapers at the Ipiutak Site at Point Hope. Only their Type 1 is comparable to the scraper blades from Point Barrow. Variations of this type include blades of triangular and oval forms and the shouldered stemmed scrapers mentioned above from Nunagiak.[2]

The common scraper of the Canadian Thule Culture was made of a caribou scapula, but stone blades were also used. Several of ground slate are described as flat on one side and rounded on the other—obviously a copy of the chipped form. Chipped blades comparable to those just described were also found. Mathiassen concluded that the Western chipped blade was the ancestral form.[3]

BEAMERS

Murdoch collected and illustrated half of a beaming tool made of the metacarpal of a caribou. It was described as a scraper for cleaning skins. He states, however, that he never observed such an instrument in use and "It is probably an obsolete tool."[4] The accuracy of his deduction is demonstrated below.

There is no temporal change in the form of this tool; consequently it is unnecessary to repeat descriptions under site headings. The beamer is made from a hollow metapodial bone, cut lengthwise to remove about half of the shaft. Good scraping edges are attained by sharpening the edges of the remaining shaft walls; the condyles serve as a handle (Fig. 92k–l). The tool was held in both hands to scrape skins laid over a round log; hence the name "beamer."

The frequency of the occurrence of this tool is most significant. As can be seen in Table 12 it is common at Birnirk and rare at the later sites. This is directly contrary to the occurrence of the stone blade thumbnail scraper and suggests that these tools interchanged function.

The distribution and probable history of the widely distributed beaming tool have been extensively discussed by several authors, most recently by Larsen and Rainey, De Laguna, and Giddings.[5] From Mason's paper all these authors were aware of the occurrence of this element at Point Barrow.

CUP-SHAPED FAT SCRAPERS

Ten rectangular, cup-shaped fat scrapers made of ivory were collected at Point Barrow by Ray's party. Murdoch states that the sharp edges of the cups were used to remove the last vestiges of blubber from seal and walrus hides when it was desired to save the oil.[6]

UTKIAVIK-NUWUK: Murdoch's description fits very well the seven fat scrapers from Utkiavik and the one from Nuwuk. However, only one of these cups was made of ivory; the balance were of antler and whale bone (Fig. 90n–o).

NUNAGIAK: The single scraper found at Nunagiak was uncovered in Structure D in the sand beach of the lagoon below Mound C. It is made of whale bone, is crescent-shaped, has a flat bottom and low sides, is 19.6 cm. long, and

[1] Collins, 1937, 151–152, Pl. 42, Figs. 4–10.
[2] Larsen and Rainey, 1948, 108, Pl. 18, Figs. 1–5.
[3] Mathiassen, 1927b, 90–91.
[4] Murdoch, 1892, 298–299, Fig. 299.
[5] Larsen and Rainey, 1948, 88–90; De Laguna, 1947, 190–191; Giddings, 1952, 77–78.
[6] Murdoch, 1892, 299, Fig. 300.

is considerably larger than the other scrapers described here (Fig. 91i).

BIRNIRK: Only two fat scrapers, both made of bone, came from Birnirk (Table 12). They are rectangular in outline and about the same size (8 cm. long) and have suspension holes. The deeper scraper shown in Fig. 92q has upturned ends which give it a boat-like shape.

COMPARISONS: Cup-shaped fat scrapers with upturned ends, similar to the specimen from Birnirk, are an element of the Okvik-Uwelen stage at the Uwelen Site in Siberia[1] and on St. Lawrence Island.[2] However, the trough-shaped scraper, the dominant form of the Okvik and Old Bering Sea periods, is not found at Point Barrow.

Fat scrapers are not recorded for the sites along the Kobuk River or from Ipiutak at Point Hope. Rasmussen's collections from recent ruins at Point Hope include this tool. A single fat scraper found at the Thule Culture site of Qilalukan by Mathiassen closely resembles modern specimens from Barrow. He considers this significant, as this tool has been found at several localities in Greenland.[3]

FISH SCALER

Three fragments of caribou metapodial bone found at Birnirk had been shaped to a broad, rounded point sharpened along the two edges (Fig. 92j). The condyles serve as convenient handles for two specimens; the third is made from a fragment of the shaft of the metapodial bone. These scalers come from the floor of House A in Mound C, beneath the floor of this same house, and from Mound J, Cut 13, Section 2.

Murdoch obtained a similar tool from Utkiavik. He understood from the Eskimo that it was used to scale fish. He remarked that the specimen did not appear to be newly made.[4] Murdoch's informant may have been correct, but this also may have been merely a ready explanation for an old archeological specimen. Special de-scaling tools are not known for other Western Eskimo. The tools from Birnirk have a certain degree of resemblance to the "sharp fat scrapers" found in Thule Culture sites[5] and among the contemporary Central Eskimo.[6]

[1] Rudenko, 1947, Pl. 4, Fig. 13.
[2] Rainey, 1941, Fig. 21, Items 1–5.
[3] Mathiassen, 1927b, 91; 1927a, 175, Pl. 53, Fig. 1.
[4] Murdoch, 1892, 311, Fig. 313.

WOODEN PEGS FOR STAKING OUT SKINS

In the course of excavations at all the sites in the vicinity of Point Barrow, wooden pegs, about 15 cm. long, split from logs and sharpened at one end were frequently found (Table 13). They were generally scattered about on house floors or in rubbish, but in several instances they were found tied in bundles. A bundle of 42 pegs was found in the entrance tunnel to House A, Mound A, Birnirk, as well as a bundle of 10 in the cache called Structure H in the same mound. Their use is obvious, for the Point Barrow people still dry seal and deerskins by pegging them to the ground, usually in a dry grassy spot. Almost every household has a bundle of pegs saved for this purpose.

TABLE 13
WOODEN PEGS FOR STAKING OUT SKINS

Location	Quantity
Utkiavik	
Above House A	3
Floor of House A	8
Cut 2, Section 1	1
Cut 2, Section 2	3
Cut 2, Section 5	2
Nunagiak	
Cut 2, Section 6	2
Mound C	
Find 1	2
Over Punuk house	2
Birnirk	
Mound A	
Cut 2, Section 5	3
Roof of House A	2
Floor Entrance, House A	42
Below Structure C	2
Floor of Structure D	1
Floor of Structure E	2
Floor of Structure H	10
Mound G, Cut 8, Section 5	2
Mound J	
Cut 13, Section 3	1
Floor 2 of house	2

[5] Mathiassen, 1927b, 91.
[6] Mathiassen, 1928, 110–111.

TABLE 14

LADLES AND BIG SPOONS

Location	Wood	Horn	Duck Sternum	Toys
Utkiavik				
Below House A	1	1	—	—
House B	—	—	1	—
Purchase	1	1	—	—
Nunagiak				
Cut 2, Section 4	1	—	—	—
Mound C				
Structure E	—	—	—	1
Entrance D	—	2	—	—
Birnirk				
Mound A				
Cut 3, Section 2	—	—	1	—
Floor of Structure H	—	—	1	—
Cut 4, 0–18 inches	—	—	—	1
Below Structure B	—	—	—	1
Mound C, floor of House A	—	—	1	—
Mound J, Cut 13, Section 2	—	—	1	—
Mound S, Cut 6, Section 2	—	—	1	—

LADLES AND SPOONS

Murdoch writes that "Each family has several spoons of various sizes, and narrow shallow ladles of horn, bone, etc. The large spoon is for stirring and ladling soup, etc. . . . These spoons seem to be in such constant use that the natives did not offer them for sale."[1] Nor did they lose them, for there are not very many in the archeological collections (Table 14).

UTKIAVIK AND NUNAGIAK: The wooden ladles from Utkiavik and Nunagiak are carved from one piece, with short straight handles joining the bowl at the rim, and deep rounded bowls oval in outline (Fig. 94c). Two ladles from Utkiavik and one from Nunagiak are made of musk-ox horn. The bowls are carved from the large swelled boss at the base of the horn and the handles from the distal portions (Figs. 93a, 94a).

BIRNIRK: The only full-sized ladles from Birnirk are the sternums of ducks and larger birds, perhaps loons or geese, with the keel trimmed off (Table 14). This bone is cup-shaped and could be used as a ladle very effectively (Fig. 95a). Two toy spoons made of wood were also found. One was very crude; in both, the handle is attached below the rim of the bowl (Fig. 95b–c).

COMPARISONS: In method of attachment of the handle, the toy spoon described above resembles two of the Old Bering Sea Period spoons from Miyowagh on St. Lawrence Island[2] and the majority of spoons found at the Ipiutak Site at Point Hope.[3] This contrasts to the recent spoons and dippers from the north coast of Alaska in which the handles join the rim of the dippers. However, this old feature is conserved until historic times, as are so many other traits, in the vicinity of Nunavak Island.[4]

Ladles and spoons are an element of the Canadian Thule Culture but seem to have no specialized form.[5]

To judge from the several published reports on Western Eskimo archeology, it would appear that the use of duck sternums as spoons or ladles is unique at the Birnirk Site. It is possible, however, that the rather insignificant detail of the neatly trimmed keel has escaped the attention of excavators.

WOODEN TRAYS AND DISHES

With considerable pleasure I recall the nu-

[1] Murdoch, 1892, 104.

[2] Collins, 1937, Pl. 51, Figs. 14, 16.

[3] Larsen and Rainey, 1948, Pl. 23, Figs. 1, 3–4, Pl. 48, Fig. 7.

[4] Nelson, 1899, 65–70, Pl. 29, Figs. 3–5, 12, Pl. 30, Figs. 19–24.

[5] Mathiassen, 1927b, 108.

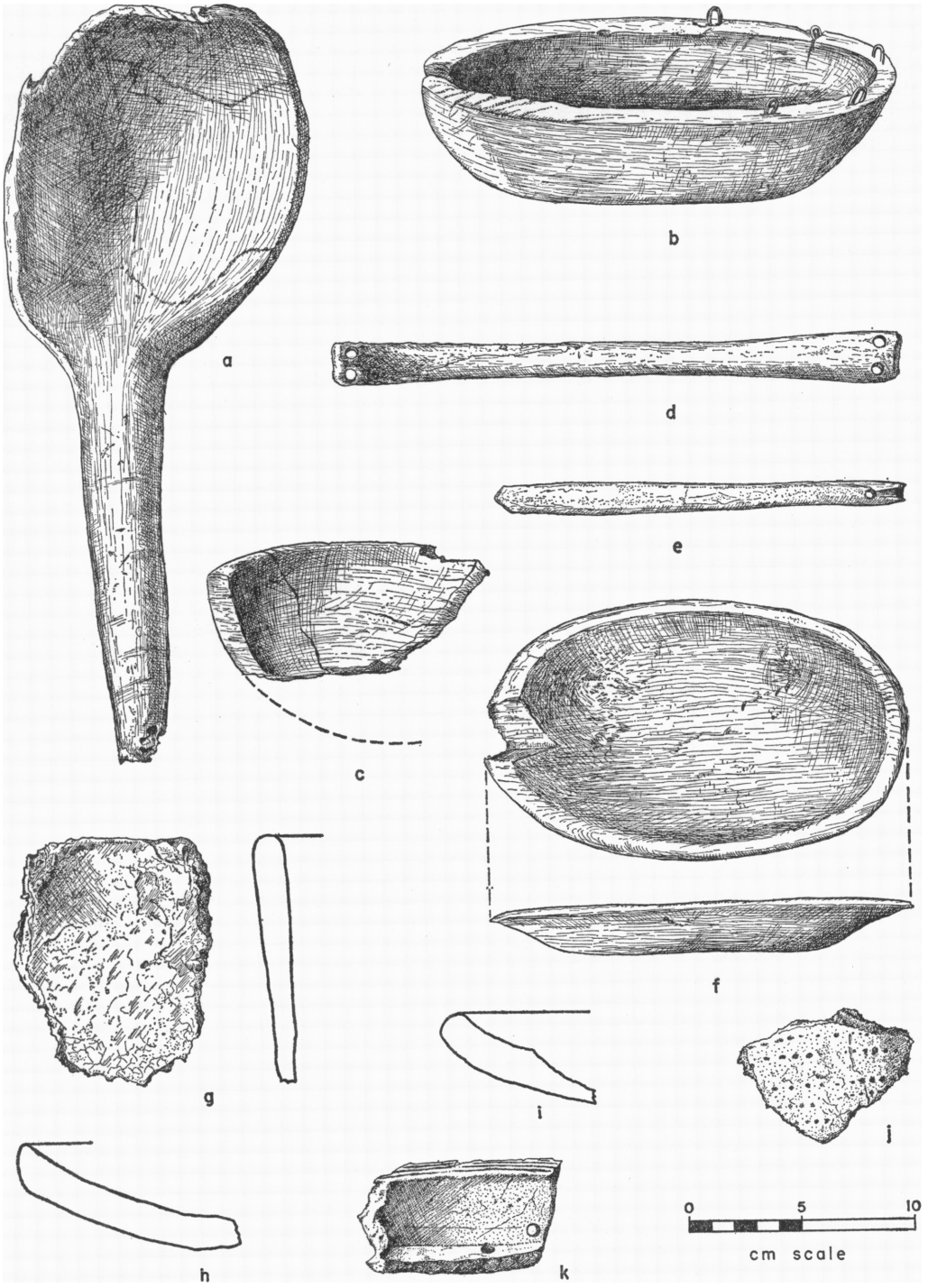


FIG. 93. Household containers from Nuwuk and Utkiavik. a. Ladle of muskox horn. b–c. Wood dishes. d–e. Bone handles for baleen buckets. f. Wooden bottom for baleen bucket of the late type. g. Potsherd and profile. h–i. Profiles of pottery lamp fragments. j. Pottery fragments. k. Fragment of soapstone pot.

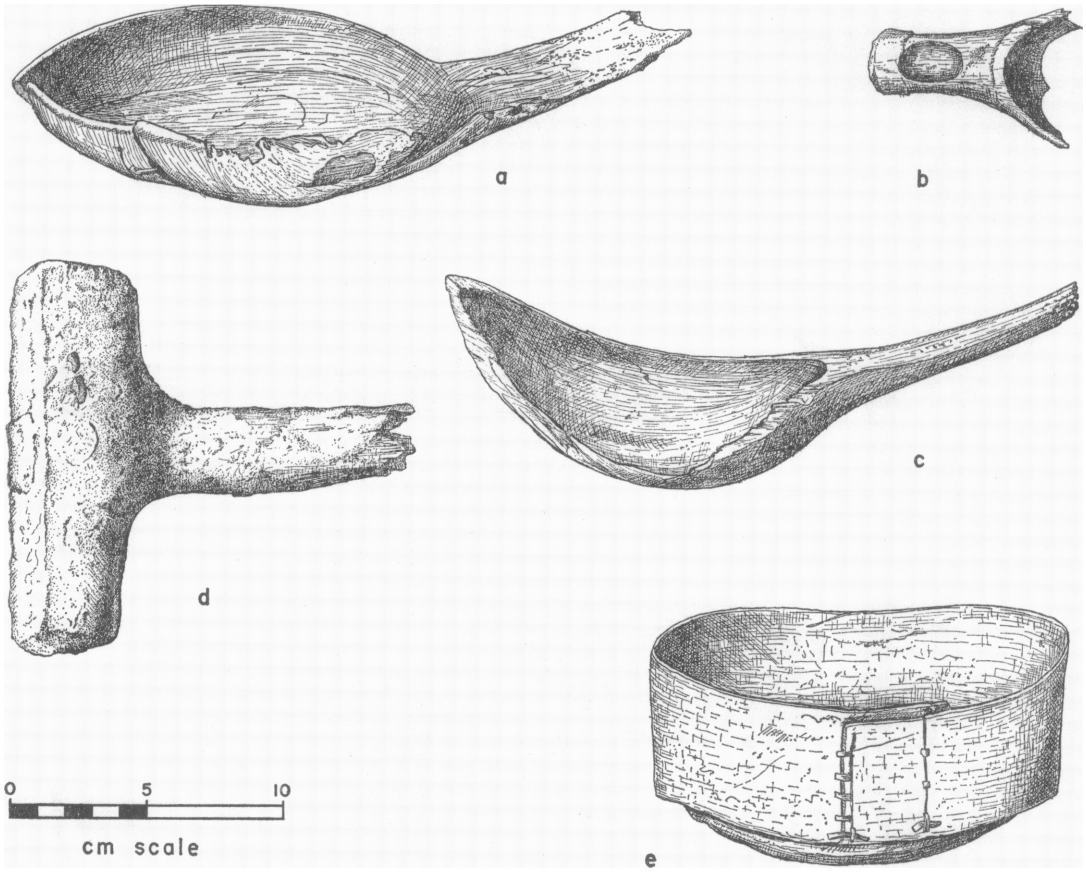


FIG. 94. Containers and tools from Nunagiak. a. Ladle made of musk-ox horn. b–c. Wooden spoons. d. Blubber pounder. e. Dish with wooden bottom and sides.

merous times I have seen the matron of a Barrow Eskimo household fish boiled seal ribs or luscious chunks of *muktuk* out of a bubbling pot and place them in an oval, low-sided tray about 50 cm. long. A tin can of seal oil, well aged in a cool place, would be placed nearby, and everyone would take out a sheath knife or an ulu and gather around.

Murdoch's description refers only to small oval bowls that were used for small portions of food.[1] I purchased one of these from an Eskimo who had been working in a contact-period house at Nuwuk. It has small brass staples driven into the rim (Fig. 93b). Also in the collection are two small ivory nails about 3 cm. long, with expanded and polished round heads. These are believed to be ornamental insets for the rims of wooden plates.

[1] Murdoch, 1892, 89, Fig. 19.

No items that could be identified as food dishes were found at the earlier sites, Nunagiak, or Birnirk.

LAMPS AND COOKING VESSELS

Soapstone lamps were in regular use for heating and lighting the houses of the Eskimo when Ray's party was at Point Barrow. These lamps were traded to the Point Barrow people from the East, eventually no doubt from the Utkusiksaligmiut of the Coronation Gulf Area of north-central Canada. These were of the well-known Central Eskimo half-moon shape, with flat bottoms and low sides, and ranged from 45 to 90 cm. in length. Two transverse partitions were usual, either carved in the stone or made of small pieces of wood.

Smaller semilunar lamps without partitions were also used as traveling lamps. Some of these were made of soapstone; others were crudely

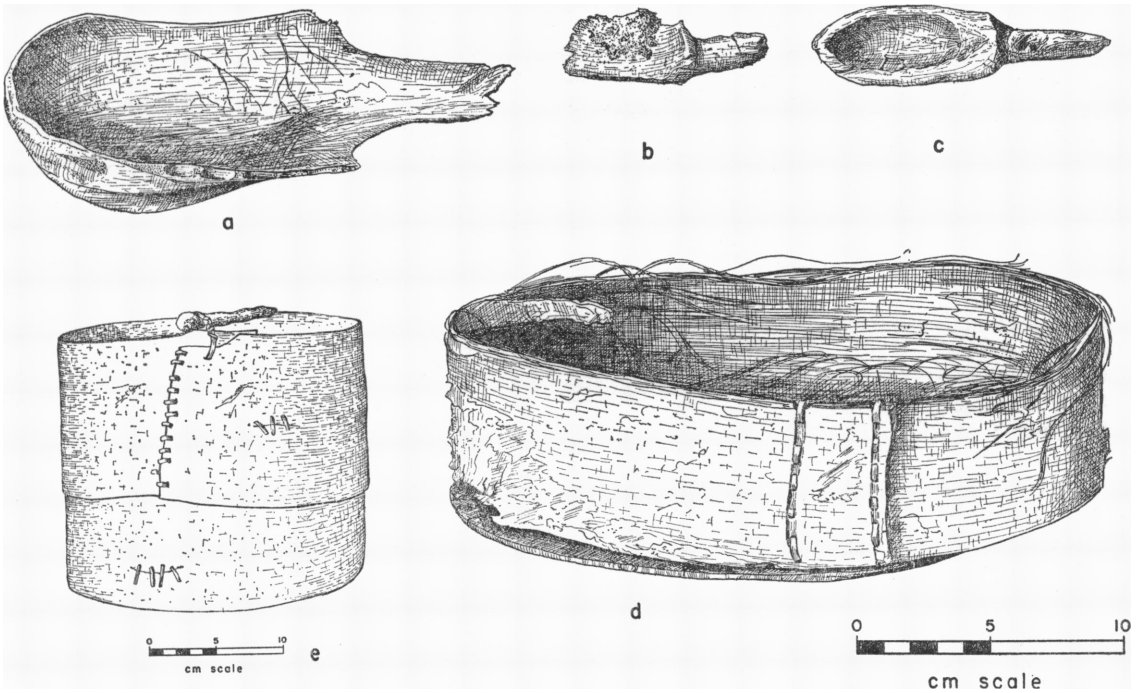


FIG. 95. Containers from Birnirk. a. Ladle made from loon sternum. b–c. Wooden spoons. d–e. Baleen bucket with wooden bottom.

formed from other soft stone, probably obtained locally.[1]

By the 1880's the soapstone vessels that had been in use earlier were already replaced by metal utensils. However, Murdoch was able to secure four fragmentary vessels sufficiently complete to show the form. Three of these were rectangular in outline, with flat bottoms and low side walls with slight outward slant. The vessel illustrated by Murdoch[2] is about 26 cm. long. The fourth vessel was similar, but roughly triangular. These pots had drilled holes, both for repair lashings and for strings to suspend them over the lamp.[3]

Murdoch also obtained three fragments of earthenware pots which he describes and illustrates.[4] These sherds probably should be classed as "St. Lawrence Corrugated."[5]

UTKIAVIK-NUWUK: Fragments of soapstone lamps are not abundant in the collections from Utkiavik and Nuwuk, but those found (Table 15) conform to the description of Murdoch. Soapstone pot fragments were even rarer. A corner fragment of a full-sized rectangular vessel came from Cut 2, Utkiavik, and a broken toy pot was purchased from the same site. These, too, conform to Murdoch's description.

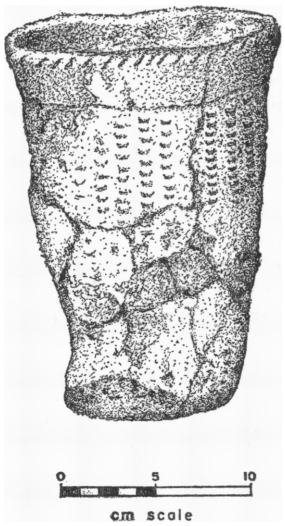


FIG. 96. Pottery vessel from Utkiavik.

[1] Murdoch, 1892, 105–109.
[2] Murdoch, 1892, Fig. 20.
[3] Murdoch, 1892, 90–93.
[4] Murdoch, 1892, 92, Fig. 22.
[5] Oswalt, 1955.

TABLE 15

POTTERY AND SOAPSTONE

Location	Soapstone Fragments			Pottery Fragments[a]		
	Lamp	Pot	Unidentified	Lamp	Vessels Plain	Vessels Decorated
Utkiavik						
Over House A	4	—	25	1	—	—
Floor of House A	1	—	9	—	—	—
House B	—	—	2[b]	—	—	—
Cut 2 Section 2	1[c]	—	1	—	—	1
Cut 2, Section 3	—	—	3	—	—	—
Cut 2, Section 5	—	—	3	—	—	—
Cut 2, Section 6	—	—	1	—	—	—
Location X	—	—	—	—	—	1[c]
Purchase	1	1	—	—	—	—
Cut 4, Section 2	—	—	2	—	—	—
Nuwuk, purchase	2	—	—	—	—	—
Nunagiak						
Cut 1, Section 1	1	—	4	—	—	—
Cut 1, Section 2	—	—	1	—	—	—
Cut 2, Section 4	—	—	1	—	—	—
Cut 2, Section 5	—	—	3	—	—	—
Cut 2, Section 6	—	—	2	—	—	—
Cut 4, Section 1	—	—	1	—	—	—
Cut 4, Section 2	—	—	1	—	—	—
Cut 4, Section 3	—	—	2	—	—	—
Cut 4, Section 4	—	—	1	—	—	—
Mound C						
Entrance D	—	—	2	1	—	—
Cache A	—	—	1	—	—	—
Above Punuk house	—	—	6	—	—	—
Mound H, Cut 6, Section 1	1	—	1	—	—	—
Birnirk						
Mound A						
Cut 2, Section 1	—	—	—	—	5	—
Cut 2, Section 3	—	—	—	4	—	—
Cut 2, Section 4	—	—	—	—	1	—
Cut 2, Section 5	—	—	—	—	2	2
Cut 3, Section 1	—	—	—	2	1	—
Cut 3, Section 2	—	—	—	4	—	1
Cut 3, Section 3	—	—	—	3	—	—
Cut 3, Section 5	—	—	—	5	2	—
Cut 3, Section 6	—	—	—	1	—	—
Cut 3, Section 7	—	—	—	1	—	—
Cut 4, 0–18 inches	—	—	—	—	3	—
Over entrance to House A	—	—	—	2	—	—
Floor of entrance to House A	—	—	—	4	—	—
Roof of House A	—	—	—	4	—	—
Floor of House A	—	—	—	4	1	—
Floor of Structure B	—	—	—	3	—	—
Below Structure B	—	—	—	5	—	—
Floor of Structure C	—	—	—	—	2	2
Below Structure C	—	—	—	2	5	—
Floor of Structure D	—	—	—	2	—	—
Below Structure D	—	—	—	3	—	—

TABLE 15—(*Continued*)

Location	Soapstone Fragments			Pottery Fragments		
	Lamp	Pot	Unidentified	Lamp	Vessels Plain	Vessels Decorated
Timbers between Structures A, E, and C	—	—	—	1	—	—
Floor of Structure E	—	—	—	4	—	—
Below floor of Structure F	—	—	—	4	—	1
Floor of Structure H	—	—	—	1	—	2
Mound C, floor of House A	—	—	—	—	1	—
Mound D						
Cut 7, Section 2	—	—	—	4	—	—
Cut 7, Section 3	—	—	—	3	—	—
Cut 7, Section 7	—	—	—	—	—	2
Mound G						
Cut 8, Section 2	—	—	—	—	1	—
Cut 8, Section 5	—	—	—	—	1	1
Cut 8, Section 6	—	—	—	2	—	—
Mound H						
Cut 9, Section 1	—	—	—	—	1	—
Cut 9, Section 2	—	—	—	—	3	1
Cut 9, Section 3	—	—	—	2	5	—
Cut 9, Section 4	—	—	—	—	1	1
Cut 9, Section 5	—	—	—	—	1	—
Cut 9, Section 6	—	—	—	—	3	—
Cut 9, Section 7	—	—	—	—	2	2
Mound J						
Cut 13, Section 1	—	—	—	—	3	1
Cut 13, Section 2	—	—	—	4	6	3
Cut 13, Section 3	—	—	—	—	—	3
Cut 13, Section 4	—	—	—	1	—	—
Floor 1 of House A	—	—	—	4	9	—
Floor 2 of House A	—	—	—	—	2	—
Mound S						
Cut 6, Section 1	—	—	—	2	—	4
Cut 6, Section 3	—	—	—	—	1	—
Mound R						
Above House A	—	—	—	—	2	—
Floor of House A	—	—	—	3	12	—

[a] Two pottery paddles were found at Birnirk: one from the roof of House A, and one from the floor of Structure E.
[b] One is decorated.
[c] Complete.

They are rectangular, with flat bottoms and low sides.

Pottery of a black, poorly fired fabric heavily tempered with sand and small gravel was common in the Utkiavik deposits. Hair or feathers may have been used as a binder, but no impressions are visible. The ware is very soft and crumbly and tends to split and flake. Thickness ranges from 1 to 2 cm., averaging about 15 mm. Most sherds are covered with a heavy layer of soot, which suggests extensive use in the fire. Most of the rim sherds were broken from nearly vertical-sided pots (Fig. 93g). Little information on the shapes of the vessel bottoms is available, but the thickened conoidal bases described below for the Birnirk Site were not found. The single complete vessel from Location X had a circular flat base (Fig. 96).

Only one rim fragment of a pottery lamp was found (Fig. 93h). This differed in no way from the lamp fragments described below from Birnirk.

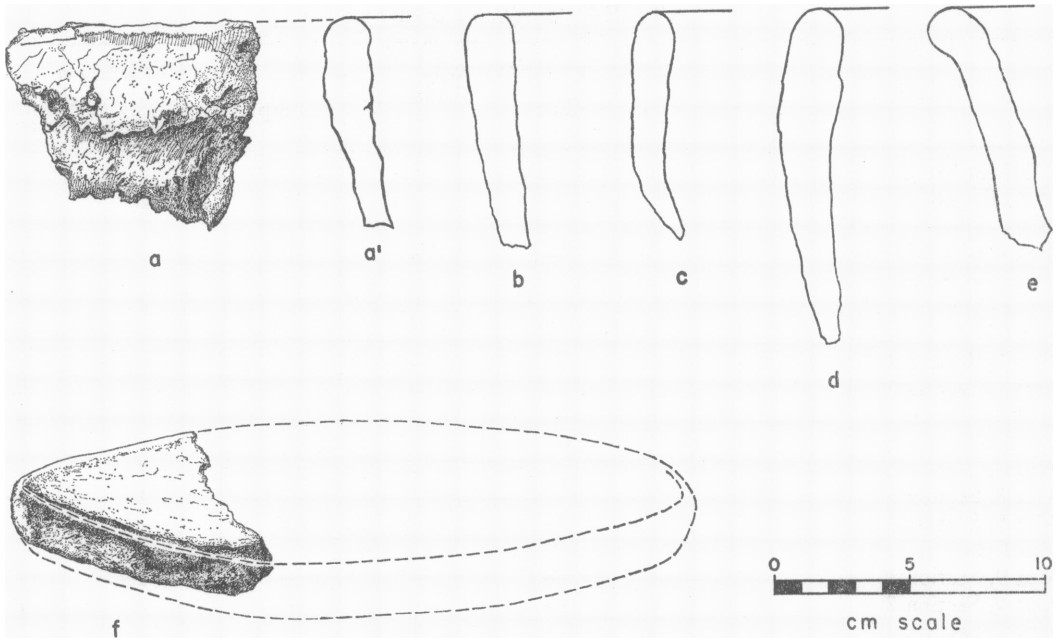


FIG. 97. Pottery fragments and a lamp fragment from Nunagiak.

Only two instances of decoration are observed. On the complete vessel shown in Fig. 96, an incised line sets off a plain rim area, and the edge of the lip is marked with shallow diagonal nicks. Below the incised line to the base the decoration consists of impressions made by an instrument like a two-pronged fork. The horizontal impressions are arranged in vertical parallel rows. Two cracks in this pot have been mended by the drilling of pairs of lacing holes near the rim. One set of holes contains baleen lacing, and clay patches cover each crack both inside and outside. A very similar vessel was collected by Rasmussen at Point Hope.[1]

On the decorated sherd from House B, Utkiavik, dentate stamp impressions are placed horizontally and arranged in rows (Fig. 93j) which, like the stamping on the complete vessel, may have run vertically up the vessel sides.

NUNAGIAK: Pottery lamp fragments were as rare at Nunagiak as at Utkiavik; only one was found (Fig. 97f). This is part of a saucer-shaped lamp like lamps from Birnirk, described below.

Nine rim sherds from Nunagiak (Fig. 97a–e) came from pots with almost vertical sides, such as were described at Utkiavik. As with the majority of the late sherds, none bears decoration. No information is available on the shapes of the bases. In details of paste, thickness, and softness the pottery from Nunagiak is indistinguishable from that of Utkiavik.

BIRNIRK: Sherds were relatively abundant at Birnirk, and lamp fragments outnumber fragments of containers (Table 15). Although this pottery does not even approach a good grade, it is slightly better than most of the pottery from Utkiavik; at least the pebbles in the tempering are not so large. The ware is black, soft, and has uneven surfaces. The average thickness is about 12 mm.; the range is from 10 to 20 mm. The rims are thicker than the side walls; the bottoms from conoidal base pots are especially thick.

The available evidence suggests that Birnirk pottery was made in only two forms. Most numerous were shallow, saucer-shaped lamps (Fig. 98e–g). No complete lamps were found, but judging from rim curvature these ranged from about 25 to about 35 cm. in diameter. The rims are thickened and have a characteristic profile. Apparently there are no wick ledges or other special features. Bottoms were probably rounded.

The second class of vessels consisted of pots with nearly vertical sides and conoidal bases—

[1] Mathiassen, 1930, Fig. 17.

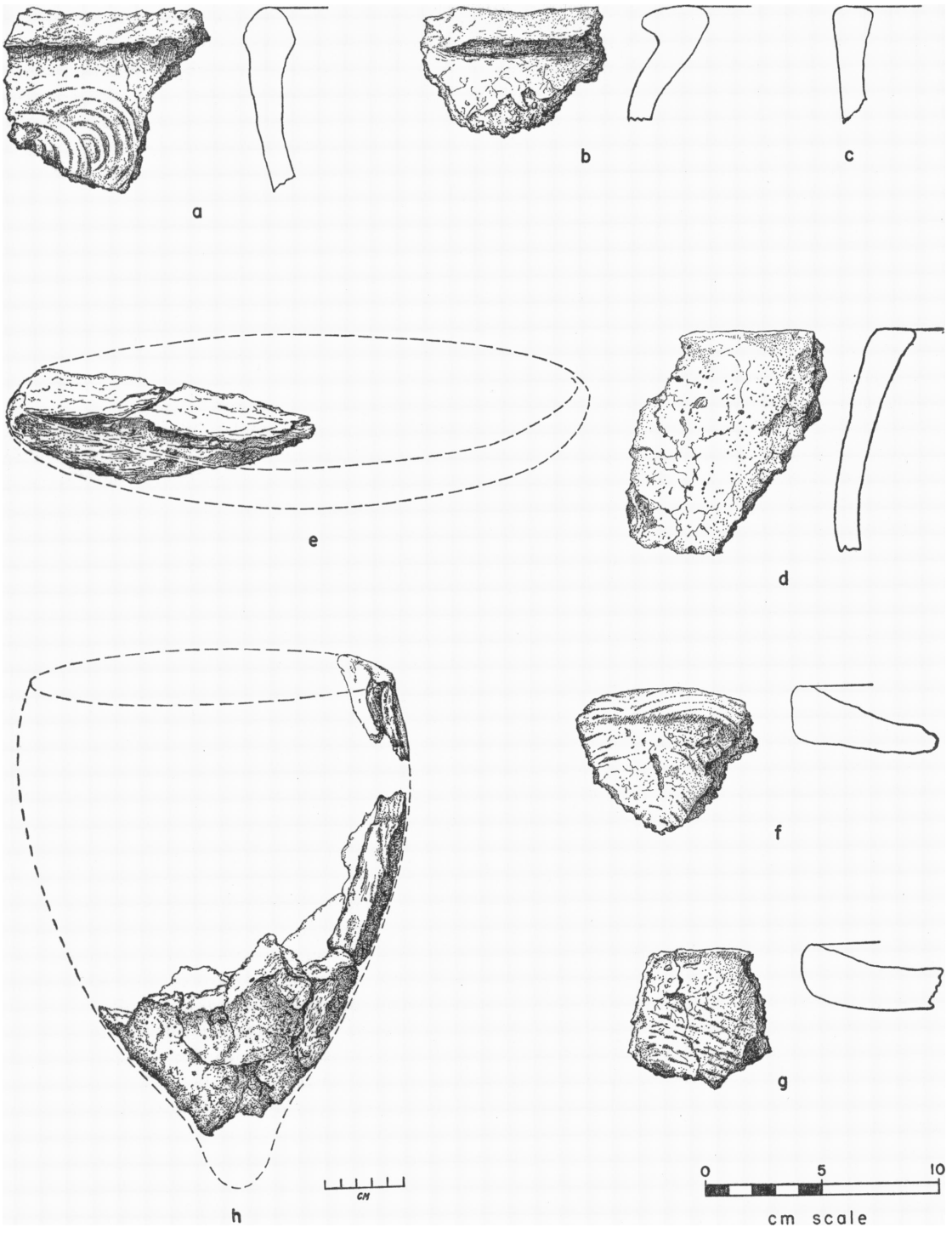


FIG. 98. Pottery and lamp fragments from Birnirk.

"bag-shaped vessels." A sufficient number of fragments was found in the house in Mound J to make a reconstruction drawing possible (Fig. 98h). Nearly all the vessel rims have similar vertical walls, and several other fragments of conoidal bases were found. The pot fragments are heavily encrusted with hard soot, doubtless from extensive use over fires built of wood and blubber.

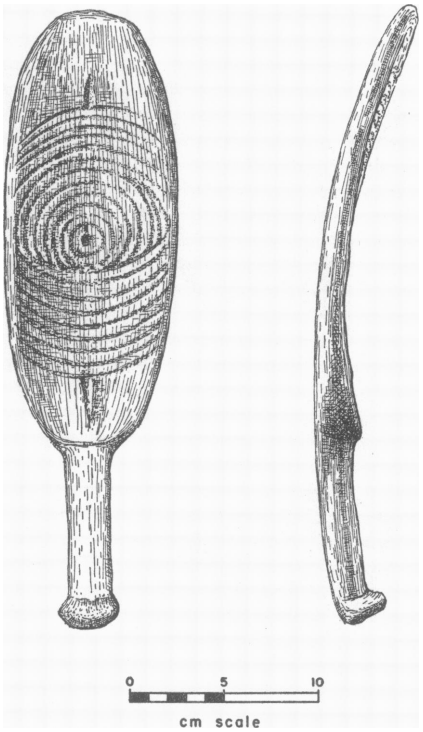


FIG. 99. Pottery paddle made of whale bone, from Birnirk.

Decoration described by Oswalt as the Type "Barrow Curvilinear Paddled"[1] is fairly common on both vessels and lamps (Table 15). This consists of the impression of a paddle carved with concentric, curvilinear designs. Usually the impressions are so faint that it is impossible to determine the details of the design. However, the discovery of the paddles is of assistance in this regard (Fig. 99). Interiors of a few lamp sherds have textile impressions (Fig. 98g).

COMPARISONS: Pottery from the Old Bering Sea periods on St. Lawrence Island and the Siberian mainland is similar in paste to that from Birnirk. The same type of shallow, saucer-like lamp was in use, but the pots had vertical walls and rounded bottoms. However, the paddled decoration was different. In contrast to the curvilinear patterns found at Birnirk, simple stamping was applied by paddles carved with parallel grooves.[2]

Giddings describes the pottery of the Kobuk River as thinner and better fired than that from the coast. The early sites of Ekseavik and Ahteut yield pottery vessels with concentric-pattern paddle markings on their exteriors.[3] This trait died out after 1400 A.D., according to Giddings' tree-ring dating.[4]

At Point Hope the sherds accompanying the Near Ipiutak finds were simple stamped, but the typical Barrow Curvilinear Paddled, as well as the shallow saucer-shaped lamps, is recorded from Thule Period deposits and from burials of the Tigara Period immediately preceding the modern period.[5] It is surprising that both this lamp form and stamped decoration should have survived into the post-Thule Period at Point Hope, as they disappeared somewhat earlier at Point Barrow.

Mathiassen found small, poorly consolidated sherds of pottery tempered with gravel at his Early Thule sites of Naujan and Malerualik, but they were so small that they demonstrated little more than the fact that pottery was known.[6] Soapstone was in common use, for both lamps and pots. The distinctive half-moon-shaped lamp of the Thule Culture with a row of knobs near the front rim is undoubtedly the forerunner of the modern soapstone lamp of the Central Region that has been traded so extensively into Alaska. The other type of soapstone lamp, a crude shallow oval bowl, may have been derived from the pottery lamp that is known to have been used earlier in the west.

Eskimo pottery has been thoroughly discussed by De Laguna,[7] and a classification system has been set up by Oswalt.[8]

[1] Oswalt, 1955.

[2] Collins, 1937, 166–169, Pl. 52, Pl. 53, Fig. 2; Rainey, 1941, 536; Rudenko, 1947, Pl. 9, Fig. 7.

[3] Named "Ahteut Curvilinear Paddled" by Oswalt, 1955.

[4] Giddings, 1952, 93–104.

[5] Larsen and Rainey, 1948, 173, 177, Pl. 91.

[6] Mathiassen, 1927b, 105–107.

[7] De Laguna, 1947, 226–249.

[8] Oswalt, 1955.

POTTERY PADDLES

BIRNIRK: Two pottery paddles were found at Birnirk. These are made of whale bone and have round handles with knobs on the end and oval flat paddling surfaces that are slightly curved to conform to the curvature of the pottery (Table 15). The face of the paddle from Structure E, Mound A, is not decorated; perhaps it is unfinished. The specimen from the later floor in House A, Mound A, has the variation of a concentric-circle design shown in Fig. 99.

KUGOK: From Kugok Burial Mound A came a third pottery paddle of ivory similar to the two described above in all details of shape except that the paddling surface is thicker. It is decorated with two sets of concentric circles (Fig. 9q).

COMPARISONS: The Birnirk type of pottery paddle undoubtedly was derived from the Old Bering Sea Culture of Bering Strait. However, the straight parallel lines cut on the older paddles would have produced so-called "simple stamped" designs. The origin of the curvilinear pattern is not immediately apparent.

De Laguna has summarized the occurrence of pottery paddles in Alaska.[1]

BUCKETS MADE OF WOOD AND BALEEN

The buckets and tubs that Murdoch collected at Nuwuk and Utkiavik were made of thin planks of wood bent into a circle, with the ends neatly sewed together. The wooden bottoms were secured in a shallow groove cut inside the vessel walls. Murdoch illustrates a vessel with baleen side walls and hypothesizes that before baleen acquired its commercial value this was probably the common form.[2] Archeological work shows this to be correct; baleen bucket parts are common in the excavations, but only three buckets with wooden side walls were found, and these were in late deposits at Utkiavik.

UTKIAVIK-NUWUK: Bucket bottoms made of spruce driftwood from Utkiavik and Nuwuk are oval in outline. They range in length from 12.4 to 18.5 cm., averaging about 15 cm. The bottoms are carved so that they have raised sides; when separated from the rims they resemble flat-bottomed dishes (Fig. 93f; Table 16). The side walls found were in rather small fragments; two were of baleen and three of thin wood planks. They were sewed with baleen lacing as described by Murdoch. Bucket handles, usually made of antler, have drilled holes in the ends to secure them to the side walls. Single holes with connecting grooves that lead to the ends of the handles are most popular (Fig. 93e). There are also paired holes (Fig. 93d), transverse holes, and single holes. Only one handle is decorated by simple notches.

NUNAGIAK: Most baleen bucket parts from Nunagiak came from the older parts of the site and in all respects are comparable to the larger series from Birnirk.

BIRNIRK: The wooden baleen bucket bottoms from both Nunagiak and Birnirk are predominantly oval in shape; they are flat in contrast to the dish-shaped bottoms from Utkiavik. Two round bottoms were found and one unusually elongated oval. Bottom sizes range from 4.5 by 7 cm. to 12 by 20 cm. They are usually between 5 and 10 mm. thick, but are thinner towards the edges that fit into the side wall grooves.

The baleen side walls are sewed with strips of the same material, usually with two rows of stitching. The seams are placed on a long side of the oval. In four buckets the side walls are formed by two baleen bands, one fastened above the other, making the vessels almost twice as deep as would be possible with a single strip (Fig. 95e). The sewing of top and lower bands is arranged on opposite sides, and each seam engages the adjacent band. The two bands are not otherwise fastened together.

The bucket handles from the Birnirk Site are made of wood and are simple rods notched at each end. Handles were lashed to the rim in the area of the seam on one side, so usually crossed the bucket at its narrowest diameter.

COMPARISONS: Baleen buckets essentially similar to those from Birnirk are found in the Okvik,[3] Old Bering Sea,[4] and Punuk stages on St. Lawrence Island. Recent buckets from the Bering Strait Region are made with wooden sides. The bottoms are more deeply dish-shaped than the bottoms of modern buckets at Barrow. There seems little doubt that this feature in the

[1] De Laguna, 1947, 233–234.
[2] Murdoch, 1892, 86–88.
[3] Rainey, 1941, Fig. 34, Items 1–2.
[4] Collins, 1937, 169–170, 239.

TABLE 16

BALEEN BUCKETS

Location	Complete Buckets	Bottoms, Dish-shaped	Bottoms, Flat	Baleen Side Walls	Baleen Side Walls, Two Sections	Wood Side Walls	Handles
Utkiavik							
Over House A	—	1	—	—	—	—	—
Floor of House A	—	—	—	—	—	1	—
Below floor of House A	—	1	—	1	—	—	—
House B	—	—	—	1	—	2	1
Cut 2, Section 1	—	—	—	1	—	—	—
Cut 2, Section 5	—	1	—	—	—	—	—
Cut 4, Section 2	—	—	1[a]	—	—	—	—
Purchased	—	6	—	—	—	—	9
Nuwuk, purchased	—	1	—	—	—	—	—
Nunagiak							
Cut 2, Section 3	—	1	—	—	—	—	—
Cut 2, Section 5	—	1	—	—	—	—	1
Cut 4, Section 1	—	—	—	—	—	—	1
Cut 4, Section 4	—	—	—	—	—	—	1
Mound C							
Entrance D	—	5	—	—	1	—	—
Structure A	—	1	—	—	—	—	—
Structure B	—	1	—	—	—	—	—
Above Punuk house	—	1	—	—	—	—	—
From beach	—	1	—	—	—	—	—
Mound H, Cut 6, Section 2	—	1	—	—	—	—	—
Birnirk							
Mound A							
Cut 2, Section 3	—	—	1	—	—	—	—
Cut 3, Section 3	—	—	1	—	—	—	—
Cut 3, Section 7	—	—	—	—	—	—	1
Ice crack, House A	—	—	1	—	—	—	—
Timbers between Structures A, E, and C	—	—	1	—	—	—	—
Roof of House A	1	—	—	1	—	—	—
Floor of House A	1	—	1	—	—	—	2
Floor entrance of House A	—	—	1	—	—	—	1
Floor of Structure B	—	—	1	—	—	—	—
Below Structure B	—	—	1	—	—	—	1
Floor of Structure C	—	—	3	—	—	—	—
Below floor of Structure C	—	—	4	—	—	—	—
Floor of Structure D	2	—	2	—	—	—	—
Floor of Structure E	—	—	2	—	—	—	—
Below Structure E	—	—	2	—	—	—	—
Floor of Structure H	—	—	6	—	—	—	—
Mound C, floor of House A	1	—	4	—	—	—	—
Mound D, Cut 7, Section 7	1	—	—	—	—	—	—
Mound J							
Cut 13, Section 2	—	—	1	—	—	—	—
Cut 13, Section 3	1	—	—	—	—	—	—
Floor 2 of House A	—	—	2	—	—	—	—
Mound O, miscellaneous	2	—	—	—	—	—	—
Mound S, Cut 6, Section 2	—	—	1[b]	—	—	—	—
Mound R, floor of House A	—	—	1	—	—	—	—

[a] Made of baleen. [b] Round in contrast to usual oval shape.

Point Barrow Area is a trait derived from the Bering Sea Region.

Giddings found bucket fragments with wooden and baleen sides at the sites on the lower part of the Kobuk,[1] and a probable fragment was found at the Ipiutak Site.[2] In both instances, poor preservation prevents a close comparison.

Containers with oval bottoms made of wood, bone, or baleen and with baleen sides are a common element of the Thule Culture in Canada.[3] These vessels have flat bottoms, so are similar to those from Birnirk. The recent two-piece containers from the Central Region, as Mathiassen notes, are made with wooden sides. This is the same trend as among the Western Eskimo.

MEAT FORKS

Neither Murdoch nor Nelson mentions meat forks, but they have been frequently described in the Central Eskimo Region.[4] Forks are used to transfer hot meat from the cooking pot to the serving tray. Meat forks were not found at Nuwuk, Utkiavik, or Nunagiak. They were, however, fairly common at Birnirk (Table 17).

TABLE 17

MEAT FORKS FROM BIRNIRK

Location	Quantity
Mound A	
Cut 3, Section 4	1
Cut 3, Section 7	1
Cut 4, 0–18 inches	1
Floor entrance to House A	2
Floor of House A	6
Below Structure B	3
Below Structure E	2
Floor of Structure F	1
Below Structure F	1
Mound R, House A	1

Evidently not much care was expended on the manufacture of any of these specimens; they are simply wooden splinters or seal ribs about 20 cm. long, sharpened at one end.

COMPARISONS: Meat forks are so simple and of such transient use that perhaps they have been overlooked by both ethnographers and archeologists. Rainey and Geist record meat forks from the St. Lawrence Punuk Period,[5] and Rasmussen found them at Point Atkinson.[6] Meat forks, often decorated, are an element of the Central Region Thule Culture, from which the modern Eastern Eskimo doubtless derived them. This element could have been derived from the Birnirk Period Culture of the Point Barrow Area.

BONE CRUSHERS

Murdoch illustrates several mauls that were used to break up bones so that the fat could be more easily rendered.[7] Most of them have stone heads lashed to short wood or antler handles. Although stone heads are most common, sections of whale rib were also used. Only three of these implements were found, and two came from recent deposits: a stone head from House A, Utkiavik, and a complete maul purchased from Nuwuk. The latter has a head of whale rib lashed to a short wooden handle. From Structure D, Mound C, Nunagiak, there is a pounder cut from one piece of wood—a tree trunk with a branch attached (Fig. 94d). This is covered with grease.

COMPARISONS: Apparently bone crushers are not old implements in the Western Arctic. Nelson, referring to the Bering Sea Area, says that bone crushers were sometimes simple hammerstones without handles. These would be impossible to identify in archeological situations. He cites two hammers with handles, one from Cape Nome and the other from Point Hope.[8]

Mathiassen describes blubber pounders of antler from Thule Culture sites in the Central Arctic where similar tools are in use today.[9] These one-piece hammers resemble the specimen from Nunagiak.

Large beach pebbles may have been used to break bones and pound blubber at an early date in the west, but apparently the tool provided with a handle originated during the spread of the Thule Culture. The single specimen from

[1] Giddings, 1952, 84–86.
[2] Larsen and Rainey, 1948, 111.
[3] Mathiassen, 1927b, 107.
[4] For example, Mathiassen, 1928, 151.
[5] Geist and Rainey, 1936, Pl. 53, Fig. 11; Pl. 63, Fig. 13.
[6] Mathiassen, 1930, 17.
[7] Murdoch, 1892, 93–99, Figs. 23–32.
[8] Nelson, 1899, 75.
[9] Mathiassen, 1927b, 108–109.

beneath Mound C at Nunagiak may be a prototype.

COMBS

Murdoch collected 10 flat hair combs; all but one were made of ivory. He illustrates three types of handles: squared off, with a ring, and with two outcurving wings[1]—variations also found in the Utkiavik and Nuwuk archeological collections. Murdoch also collected tubular combs made of antler, with rather large teeth. These combs were used for combing deerskins.[2]

UTKIAVIK-NUWUK: In the collections from the recent refuse at Utkiavik and Nuwuk the flat combs, made of ivory or antler, were the most numerous type. One flat comb and one tubular comb were on the floor of House B, Utkiavik, which, there is good reason to believe, was abandoned about 1870 (Table 18).

The single circular comb found (Fig. 100e) is obviously of the same type as that described by Murdoch, but differs slightly from the combs he illustrates. The hair combs from Nuwuk and Utkiavik are usually made of thin slabs of ivory; infrequently, of antler or bone. The slight curve of some of the combs reflects the curve of the material. The teeth, which number from eight to 12, are finer than those on the combs for deerskin. Six of the combs from these two late sites have characteristic two-pronged wings separated by a U-shaped scallop (Fig. 100b–c). Four have simple rounded handles, one a rounded handle with a hole in it (Fig. 101o), and three combs have squared-off handles. One of the handles is decorated with a simple ladder design (Fig. 101n).

TABLE 18

COMBS

Location	Flat	Tubular
Utkiavik		
Over House A	2	—
House B	1	1
Cut 4, Section 2	1	—
Purchase	15	1
Nuwuk, purchase	4	—
Nunagiak		
Cut 2, Section 2	1	—
Cut 4, Section 1	1	—

NUNAGIAK: Two combs, both of the flat type, were found at Nunagiak. The broken comb from Cut 4, Section 1, is crudely made of wood, has large teeth, and a squared handle (Fig. 102b). The second, from Cut 2, Section 2, also has large teeth but is made of ivory and has a two-winged ornamental handle (Fig. 102a). As the upper levels of the Nunagiak Site are apparently no older than the middens at Utkiavik, these two combs cannot be considered as early forms.

COMPARISONS: On St. Lawrence Island a small ivory comb of the basic design of the hair combs described above came from the Old Bering Sea Period deposits at Miyowagh.[3] Combs of this class are fairly common in the Punuk Period deposits. These are thin ivory combs with about seven fine teeth. The handles which narrow above the teeth, some slightly and some markedly, have simple triangular pointed ends. The suspension holes in the handles are small.

Along the Kobuk River the earliest comb was found at the Ekseavik Site which is dated 1400 A.D.[4] This has a long handle that curves in above the teeth rather than outward; the top of the handle has a V-shaped cut. Combs were absent from the Ipiutak finds at Point Hope.

Flat combs are characteristic of the Thule Culture of Central Canada; the apparently earliest forms have tapering handles with simple squared-off ends.[5] These flat combs are more similar to the common Punuk type than to any others found in the West.

De Laguna has discussed the distribution of combs in North America.[6] As she points out, the one-piece comb is found in the Laurentian cultural stage of New York State, and recent radiocarbon dates suggest a date of at least 2000 B.C.[7] This makes it difficult to assign the origin of the combs of the Thule Culture to the Old Bering Sea and Punuk cultures of the Western Arctic. At least, this trait does not seem to have diffused through the Birnirk cultural complex.

[1] Murdoch, 1892, 149–150, Fig. 98.
[2] Murdoch, 1892, 300–301, Fig. 301.
[3] Collins, 1936, 175, Pl. 58, Fig. 10.
[4] Giddings, 1952, 89, Pl. 33, Fig. 19.
[5] Mathiassen, 1927b, 113–115.
[6] De Laguna, 1947, 222–224.
[7] Ritchie, 1951.

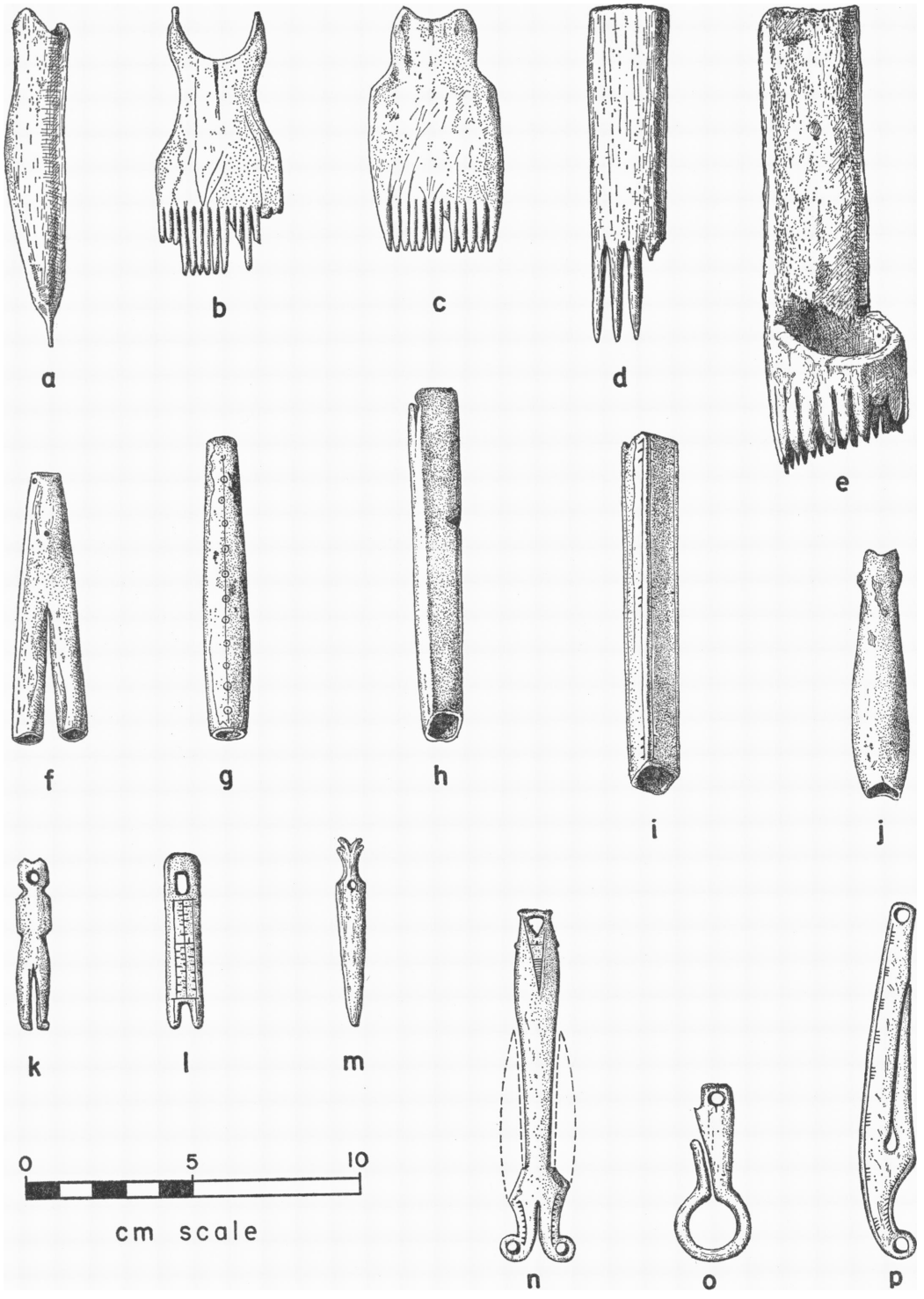


FIG. 100. Combs and sewing gear from Nuwuk and Utkiavik. a. Bone awl. b–c. Hair combs. d–e. Combs for deerskin. f–j. Needle cases. k–m. Needle case pulls. n–p. Thimble holders.

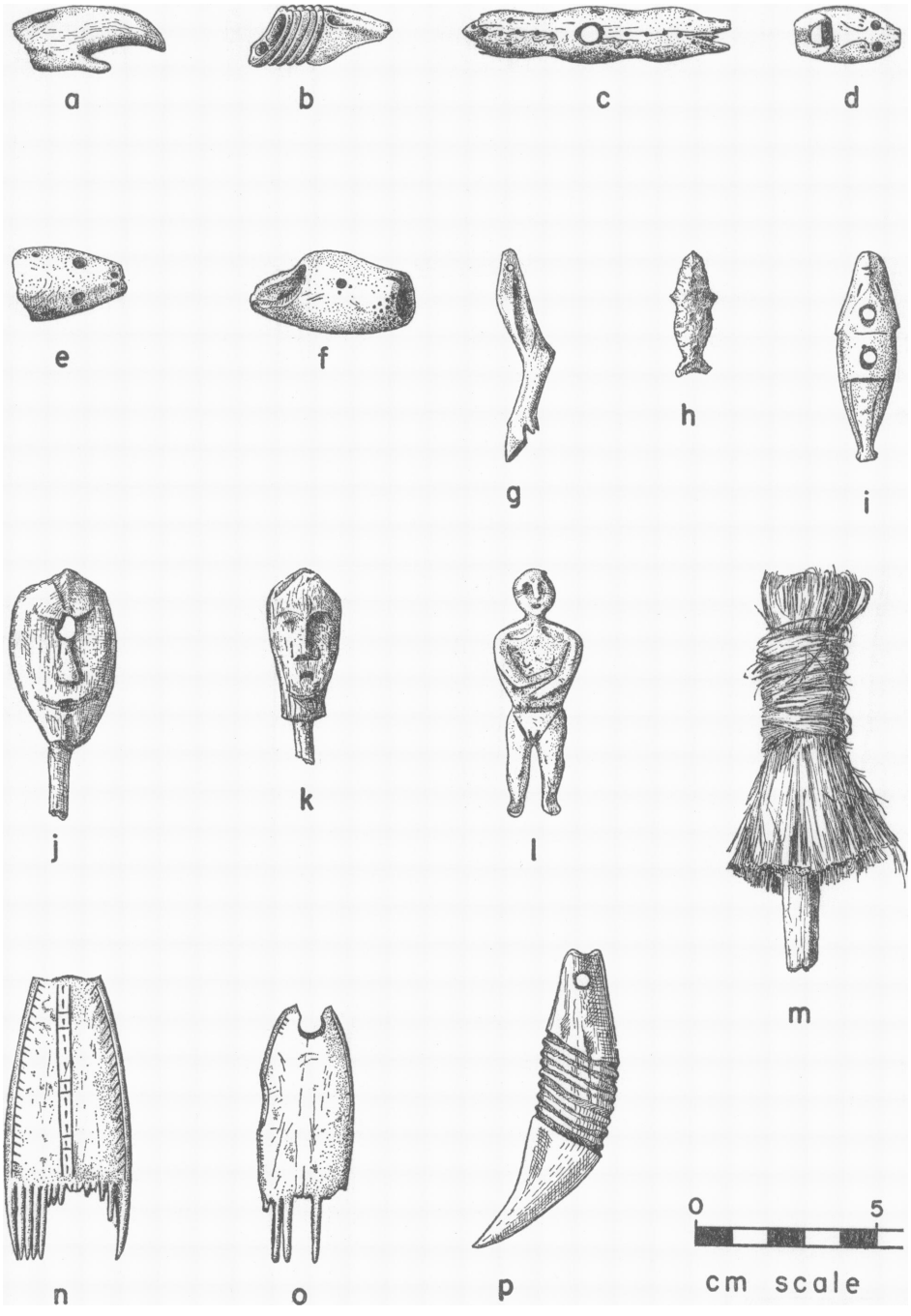


FIG. 101. Toggles, dolls, and combs from Nuwuk and Utkiavik. a–b, d–f. Line toggles of ivory. c, i. Bone handles. g. Ivory ornament in shape of deer leg. h. Whale effigy of chipped flint. j–k. Doll heads made of wood. l. Ivory doll. m. Doll made of shredded baleen. n–o. Ivory hair combs. p. Grooved and perforated polar bear tooth.

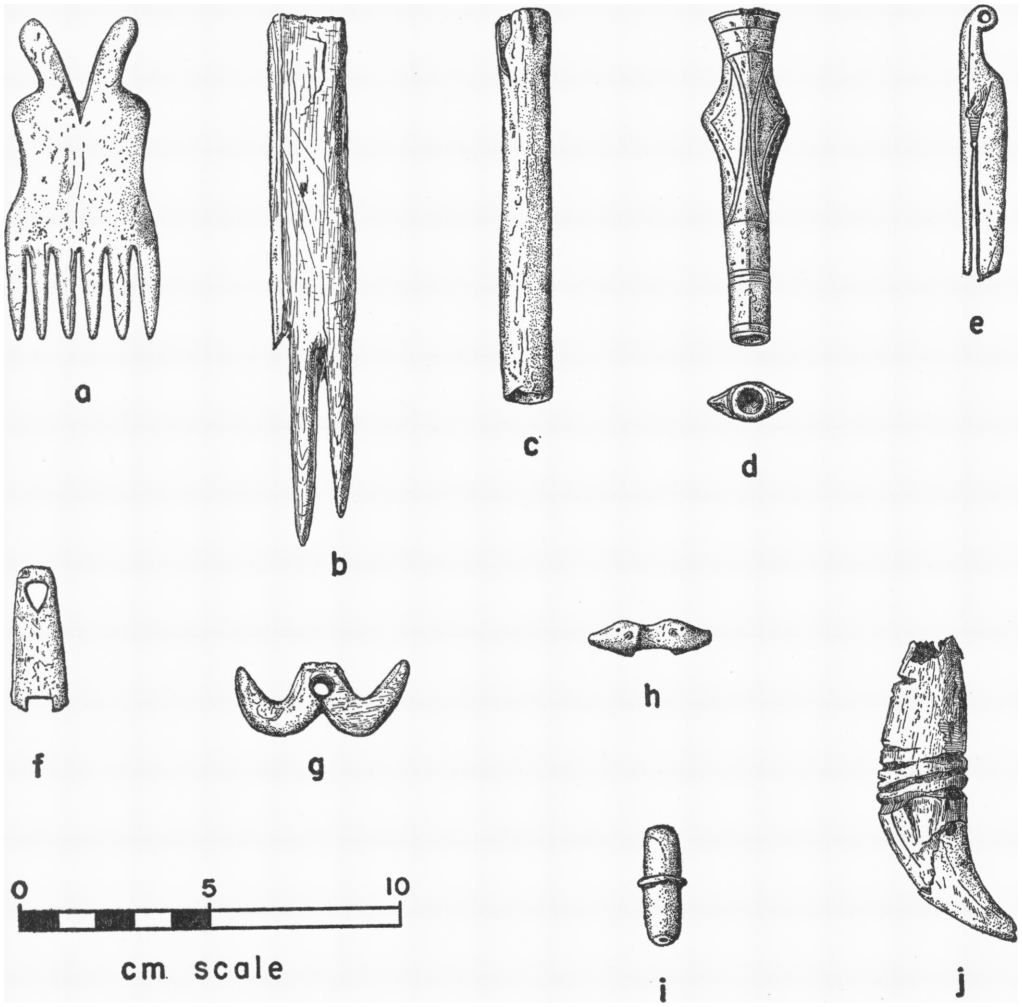


FIG. 102. Combs and needle cases from Nunagiak. a–b. Bone and wooden combs. c. Needle case made of bird wing bone. d. Ivory needle case. e–g. Thimble holders. h–i. Unidentified ivory objects. j. Grooved and perforated polar bear tooth.

BONE AWLS

Bone awls, a ubiquitous sort of artifact, are found so generally over the entire area of Eskimo culture that they have little diagnostic value. The bone awls found at sites in the Point Barrow Area are listed in Table 19. Although little care was expended in shaping them, they can be described in two groups. Slightly more common than others are fragments of deer metapodial bone, sharpened at one end but not otherwise modified (Figs. 100a, 103a). When this bone is scraped clean of tissue and given a sharp rap, it breaks into numerous fragments almost as though it were made of glass. This is a regular practice when extracting the rod of marrow which is a highly prized delicacy. It is a logical conclusion that some of these sharp bone fragments should have been used as awls. Awls are also made of the wing bones of ducks or larger birds. An articular surface on these usually serves as a handle (Fig. 103b).

NEEDLE CASES, THIMBLE HOLDERS, AND NEEDLE CASE PULLS

The modest height of artistic achievement of the Point Barrow Eskimo was attained in the

TABLE 19

AWLS MADE OF DEER AND BIRD BONE

Location	Quantity
Utkiavik	
Over House A	3
Floor of House A	1
House B	2[a]
Cut 2, Section 2	1
Purchased	19
Birnirk	
Mound A	
Cut 2, Section 5	1
Cut 3, Section 1	2
Floor of House A	3
Floor of Structure C	1
Below Structure C	1
Floor of Structure E	1
Below Structure E	2
Floor of Structure H	1
Mound C, floor of House A	2
Mound J, Cut 13, Section 1	1
Mound S, Cut 6, Section 1	1

[a] Antler.

manufacture of needle cases and attendant equipment. Most of the recent needle cases consist of sections of the wing bone of large birds, such as swan or king loon, or ivory cylinders made in imitation of such natural containers.[1]

UTKIAVIK-NUWUK: A selection of the needle cases, anchor-shaped thimble holders, a toggle-type thimble holder, and small ornamental objects that probably served as pulls is shown in Fig. 100f–p. As described by Murdoch, most of the needle cases are cylindrical, made of either bird bone or ivory. Some are rectangular in section; decoration of any sort is sparse. The needle case shown in Fig. 100f probably represents the human torso and legs, the only needle case representation of the human figure in this collection. The anchor-shaped thimble holders (Fig. 100n) are somewhat more varied in shape than those illustrated by Murdoch. However, all have parallels in Nelson's collection from the Bering Sea Area.[2]

NUNAGIAK: Two needle cases were found at Nunagiak (Table 20; Fig. 102c–d). One is a simple tube, a section of the wing bone of a large bird. The other, from Structure G, Cut 1, is an example of the Western variant of the "winged" needle case. Made of ivory, it is decorated with incised lines, some of which are paralleled by crude dotted lines. The decoration is repeated on the side not shown.

Two small ivory toggles, usually considered as thimble holders, and a fragment of an anchor-shaped thimble holder made of ivory are shown in Fig. 102f–h. The latter is exactly like the specimens from Utkiavik and Nuwuk.

BIRNIRK: Three needle cases of ivory were found at Birnirk (Table 20). The fragment from below Structure C, Mound A, is shown in two views (Fig. 103c, c′). Evidently it had rudimentary knobs and the rather heavy, crude version of Old Bering Sea Style 1 (or Okvik) art that characterizes the Point Barrow Area. Straight radiating lines and heavy dotted lines are featured.

The needle case from the floor of House A, Mound J, is oval in section and wider in the center than at the ends (Fig. 103d). It is decorated with lightly incised parallel lines that form a ladder-like design. Alternate spurs are spaced along the lines. Spaced along each side of the central frame are paired lines that extend outward to form small loops around incised dots. The opposite face of the needle case evidently had a similar design that has been almost obliterated by wear.

The third ivory needle case accompanied Burial 1 in Mound R (Fig. 103 e, e′). This has what might actually be called "wings," curving bridge-like projections on each side that are attached to the central part of the case only at each end. The simple decoration is in the form of drilled holes that probably once held baleen plugs and lightly incised straight lines.

DISCUSSION: Three additional old needle cases from the Point Barrow Area in the Van Valin Collection are described and illustrated by Mason.[3] The case he illustrates in Pl. 4, Fig. 7, and details of design (his Fig. 1, right) are very similar in shape and decoration to the needle case shown here as Fig. 103d. The needle case shown in Mason's Pl. 4, Fig. 6 (design detail, Fig. 1, left) resembles in shape the winged case illustrated here as Fig. 103e, e′. It differs,

[1] Murdoch, 1892, 317–322. Murdoch had the mistaken idea that the thimble hooks were used to attach the needle case to the belt.

[2] Nelson, 1899, Pl. 44.

[3] Mason, 1930, 387, Pl. 4, Figs. 6–8; Fig. 1.

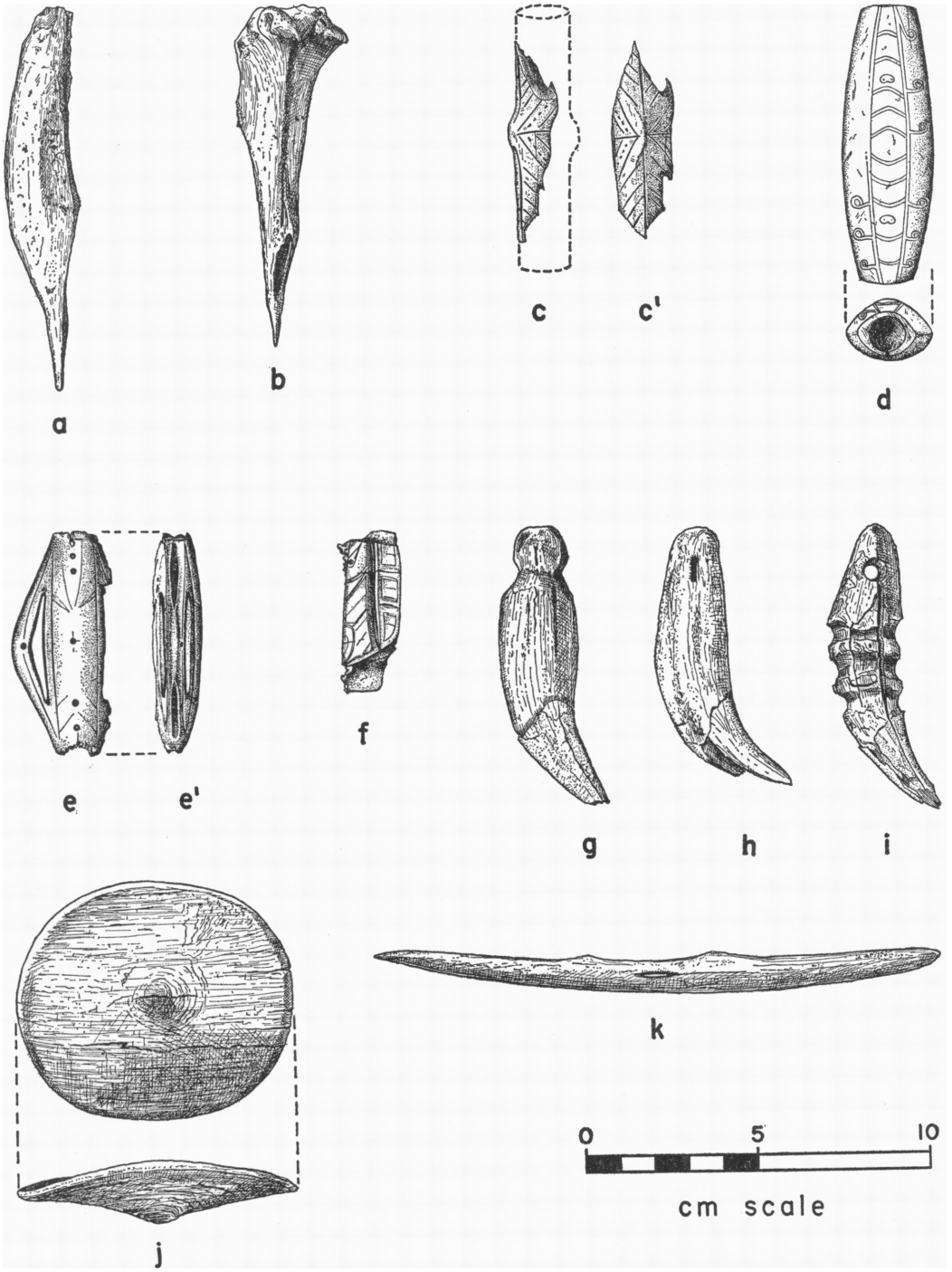


FIG. 103. Awls, needle cases, and ornaments. a–b. Bone awls. c–e. Needle cases made of ivory. f. Fragment of ivory with Old Bering Sea style decoration. g–i. Polar bear teeth prepared for suspension. j. Button made of horn. k. Toggle made of ivory.

TABLE 20

SEWING GEAR

Location	Needle Cases	Double Crescent Thimble Holders	Anchor-shaped Thimble Holders
Utkiavik			
Over House A	1	—	—
Cut 2, Section 1	2	—	—
Location X	2	—	—
Cut 4, Section 2	1	—	1
Purchase	16	1	4
Nuwuk, purchase	5	—	16
Nunagiak			
Cut 1, Section 2	1	1	2
Mound C, Entrance D	1	—	—
Birnirk			
Mound A, below Structure C	1	—	—
Mound J, floor of House A	1	—	—
Mound R, Cut 11, Section 1, Burial 1	1	—	—

however, in that the arched wings are shorter. The decoration is composed of paired lines, dashed lines, and triangles, apparently lightly incised. The third fragment has short projecting flanges on each side.

The history of Eskimo needle cases has been treated extensively by several writers. Collins has summarized these discussions and is in agreement with several previous authors that the knobbed Western needle case and the winged form of the Central Canada Thule Culture and of Greenland have a common origin in the somewhat variable knobbed form of the Old Bering Sea Period.[1] The evidence presented here supports this conclusion.

It should be noted that the decoration on the needle cases obtained both by Van Valin and by me conforms to Old Bering Sea Style 1, or Okvik style. Thus it would seem that the influence into the Point Barrow Area derives from this earlier period rather than from the more elaborately decorated late Old Bering Sea Period as represented at the Miyowagh Site on St. Lawrence Island.

Collins[2] further points to the fact that Punuk Period specimens have in addition an enlarged flange at the upper end, a trait found in modern Alaskan cases and also on two needle cases from Point Barrow illustrated by Mathiassen.[3] The latter two specimens are identical in form and very similar in decoration to the case that came from Mound C at Nunagiak, in a Thule Culture context (Fig. 102d).

A similar needle case with somewhat more exaggerated wings, a thimble holder of the long hook type, and a needle case pull similar to the one from Nunagiak (Fig. 102g) were found by Giddings at the Ekseavik Site on the Kobuk.[4] This has a tree-ring date of about 1400 A.D.

Thimble holders of the long-pronged varieties of the so-called anchor shape which have been described from Utkiavik were not found at Birnirk: only two were found in late contexts at the generally intermediate Nunagiak Site. These devices are missing from the St. Lawrence Island sequence, but the double-crescent needle case pull, or thimble holder, similar to the one shown in Fig. 102g, is known in the Punuk Period.[5]

The anchor-shaped thimble holders are present in modern Greenland and Central Eskimo cultures but are missing from early Thule Culture sites in the Central Region, although the double crescent variety is present.[6] Larsen and Rainey are doubtless correct in stating that this more complex form must have originated in the East subsequent to the Thule Culture and spread into Alaska.[7] Giddings' find at Ekseavik indicates that this westward distribution had occurred by 1400 A.D.

[1] Collins, 1937, 351–354.
[2] Collins, 1937, 353.
[3] Mathiassen, 1927b, Fig. 4.
[4] Giddings, 1952, Pl. 33, Figs. 2, 4, 9.
[5] Collins, 1937, 241, Pl. 82, Fig. 23.
[6] Mathiassen, 1927b, 97–98.
[7] Larsen and Rainey, 1948, 178.

ORNAMENTS AND CLOTHING

TOGGLES, ORNAMENTS, "BUTTERFLY" OBJECT, AND LANCET

Murdoch illustrates a single belt fastener made of ivory and writes: "Figure 86, . . . is an object which is quite uncommon and seldom if ever now seen in use."[1] He notes that a brass clock wheel served as a toggle for a girl's belt, so perhaps more modern devices were then coming into use. Toggles go back rather far in Eskimo prehistory. Nelson illustrates a number of belt toggles from the Bering Sea Coast where they were in common use in historic times.[2]

UTKIAVIK-NUWUK: Belt toggles must have gone out of style at a recent date at Point Barrow, for four are included in the archeological collections. As reported by Nelson, these vary in form and are made of antler or ivory. The toggle shown in Fig. 101c represents a seal; the belt toggle (Fig. 101i) is in the form of a whale.

The Nuwuk and Utkiavik purchased collections also include four line toggles (Fig. 101a–b). These are made of ivory in the shape of animal heads and have a small hole running through them longitudinally. In addition, there are holes at one end of these more or less tubular objects, for tying a cord. Apparently these toggles operated like tent rope toggles, but I am uncertain as to their use.

NUNAGIAK: One specimen recovered from Nunagiak seems to be a small belt toggle. It is made of ivory and has two animal heads carved on it (Fig. 102h). The use of the small ivory tube with squared ridge carved about the middle is uncertain (Fig. 102i).

BIRNIRK: Belt toggles, and unidentifiable objects that may have served a similar purpose, are fairly common at Birnirk. In order to reduce confusion in describing these rather varied items, it seems practical to make comparisons immediately following the descriptions rather than in a separate section as heretofore.

The horn button in Fig. 103j has small holes drilled obliquely on the obverse so that they meet. Although larger, this is essentially similar to the oval-shaped buttons from the Miyowagh Site on St. Lawrence Island.[3]

[1] Murdoch, 1892, 138, Fig. 86.
[2] Nelson, 1899, 59–63, Pl. 27.
[3] Collins, 1937, 177, Pl. 58, Figs. 3–5.

The ivory toggles (Figs. 103k, 105q–r) were probably also used to fasten belts. Toggles of this form appear in the Okvik Stage of St. Lawrence Island[4] and continue through to modern times in the Bering Strait Area.[5] They are also commonly found in the Thule Culture sites of northern Canada.[6]

Small animal figures carved of ivory resemble the line toggles described above from Utkiavik and Nuwuk; the perforations are, however, not so arranged that they could function in the same fashion (Fig. 104a, n–o). These are possibly also belt fasteners.

The toggle in Fig. 105q is triangular in section and bears a simple incised design as in Punuk art. The animal represented in Fig. 105s has an incised-line and a parallel dashed-line design that resembles a degenerate version of Old Bering Sea style design. Specifically it resembles a decorated harpoon head that Stefánsson obtained from Birnirk.[7]

TABLE 21

LINE AND ORNAMENTAL TOGGLES

Location	Line	Ornamental
Utkiavik		
Over entrance to House A	1	—
Purchase	4	11
Nuwuk, purchase	1	—
Birnirk		
Mound A		
Cut 3, Section 1	—	1
Cut 3, Section 2	—	1
Cut 3, Section 7	—	1
House A, ice crack	—	1
Floor entrance, House A	—	1
Below Structure B	—	1
Below Structure C	—	2
Mound C		
Floor of House A	—	4
Below floor of House A	—	1
Mound J, Floor 1 of House A	—	1

The undecorated belt hook of ivory (Fig. 105e) came from the floor of House A, Mound

[4] Rainey, 1941, Fig. 23, Item 8.
[5] Collins, 1937, Pl. 82, Fig. 25 (Punuk); Rudenko, 1947, Pl. 29, Fig. 4.
[6] Mathiassen, 1927a, Pl. 29, Fig. 8, Pl. 52, Fig. 8, Pl. 76, Fig. 11.
[7] Wissler, 1916, Fig. 6.

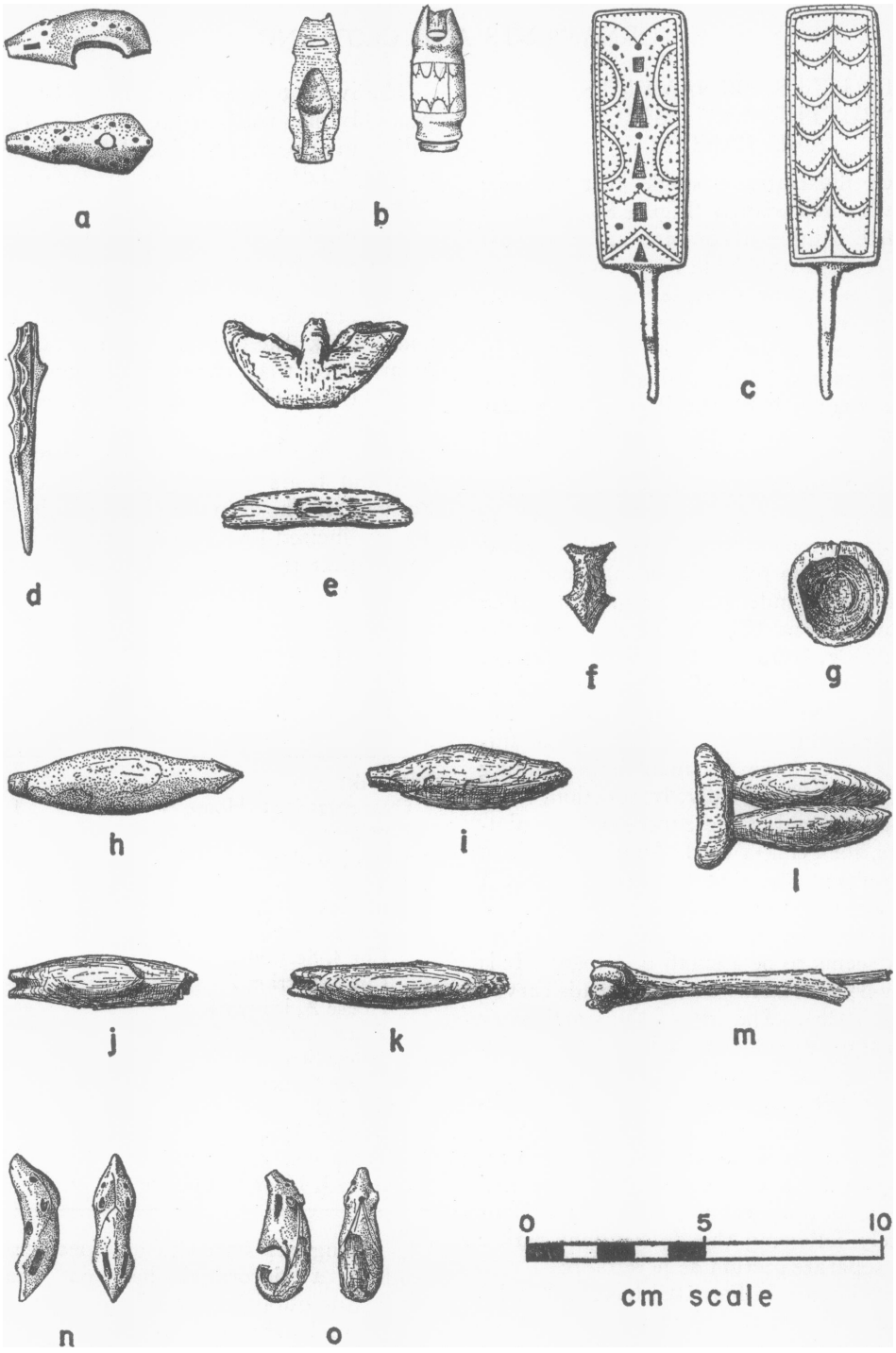


FIG. 104. Ornaments and problematical objects from Birnirk and Nuvuwaruk. a, n–o. Ivory toggles. b. Half of a small ivory container. c. Two views of a two-pronged, comb-like object of ivory. d. Ivory bodkin. e. Two views of miniature winged object made of bark. f. Chipped flint lancet. g. Miniature wooden bowl, possibly toy lamp. h–k. Toy seals made of bark. l. Twin whales made of bark. m. Inserted bird wing bones.

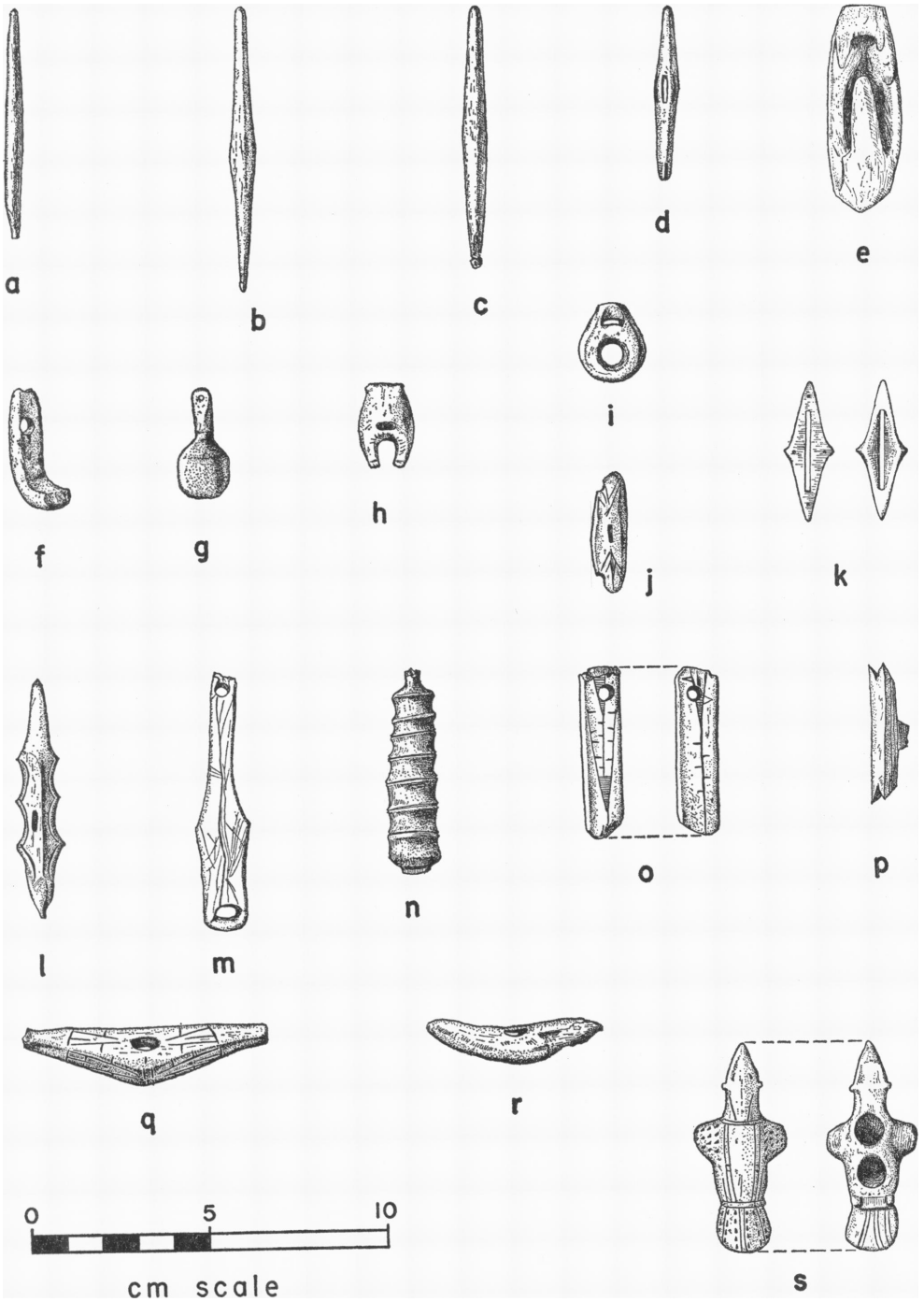


FIG. 105. Small items from Birnirk. a–d. Engraving tools. e–s. Ivory hooks and toggles; k shows two identical buckles that were found together.

C. It will be recalled that two ivory hooks were found at the Kugok Burial Site (Fig. 10a–b). Similar hooks are an element of the Okvik and Old Bering Sea Culture stages in the Bering Strait Region.[1]

Small ivory objects of undetermined use are probably ornaments (Figs. 104b–d, 105f–p). The knobbed pendant (Fig. 105g) is very similar to two illustrated from the Sirhenik Site in Siberia.[2] A similar pendant came from Southampton Island.[3] Two thin ivory buckles (Fig. 105k) were found together and were presumably used as a pair. Possibly the piece of ivory illustrated in Fig. 105p is an inlay for some wooden object. Figure 104b presents two views of half of some sort of container made of ivory. The two halves were held together by a suspension cord at one end and a cord in a narrow groove at the other. This was probably a container for a charm. The decorated ivory object shown in two views in Fig. 104c once had two prongs. Although the decoration includes elements common to Eskimo art, it does not clearly conform to any of the well-defined styles.

An ivory fragment, triangular in section (Fig. 104d), was probably part of a bodkin.

A miniature "butterfly" object made of bark is shown in Fig. 104e. This is the only indication that the Birnirk people were acquainted with this artifact so well known in the Bering Strait Region where toy objects of this type were also made.[4] It is certainly significant that this object, from outside the wall of House A, Mound A, is of the same shape that was made late in the Old Bering Sea Period on St. Lawrence Island. The full-sized Punuk style "trident" from Nunagiak, described above (p. 63), is the only other known occurrence of this class of object in the Point Barrow Region.

The object illustrated in Fig. 104f was bifacially chipped from crystal quartz. It may be a whale effigy similar to the better-executed example from Utkiavik (Fig. 101h); on the other hand, it is possibly a lancet used by a shaman in treating the sick. However, the lancets described by Nelson,[5] Mathiassen,[6] and Giddings[7] were made of jade or slate and were ground into shape. Probably the earliest occurrence of this lancet is at Giddings' Kobuk River Ahteut Site (tree-ring date, 1250 A.D.).

PERFORATED POLAR BEAR TEETH

The canine teeth of polar bear, perforated or grooved at the proximal end for suspension, are a fairly common artifact from the beginning to the end of the chronology in the Point Barrow Region (Figs. 101p, 102j, 103g–i). Perforations are more common than grooves. The holes in two of the teeth from Birnirk have been cut rather than drilled (Fig. 103h). By a curious coincidence one tooth from each of the four midden sites excavated was decorated with encircling parallel grooves; the specimen from Birnirk had wide grooves, but the grooves on the teeth from the later sites are finer.

COMPARISONS: Perforated animal teeth, especially of dog and fox, are a rather common element of Eskimo culture. However, polar bear canine teeth do have a significant distribution. According to Collins they are rather rare in Old Bering Sea deposits on St. Lawrence Island, but were common later.[8] At the Old Kotzebue Site on the Kobuk River (tree-ring date, 1400 A.D.) Giddings found a tooth ringed with parallel grooves very similar to the tooth illustrated here from Utkiavik (Fig. 101p).[9] Grooved and pierced polar bear teeth, worn either as ornaments or amulets, are common in the Canadian Thule Culture sites.[10] Grooved bear teeth from Naujan, to judge from the description, seem to be similar to those from the Point Barrow Region.[11]

CLOTHING

Three classes of boots are in use among the Arctic Eskimo in Alaska. Deerskin boots with heavy deerskin soles, with the fur turned inside, are worn in winter. For the slightly damp conditions of spring and fall, boots with deerskin uppers and soles made of the skin of the *ugruk* (big seal) are worn. For the wet weather

[1] Rainey, 1941, Fig. 23, Items 6–7; Collins, 1937, Pl. 15, Fig. 10.
[2] Rudenko, 1947, Pl. 27, Figs. 5–6.
[3] Mathiassen, 1927a, Pl. 76, Fig. 10.
[4] Collins, 1937, Pl. 59, Figs. 22–24.
[5] Nelson, 1899, 309–310, Fig. 97.
[6] Mathiassen, 1930, 26.
[7] Giddings, 1952, 91–92, Pl. 15, Fig. 14, Pl. 43, Figs. 25, 27, Pl. 17, Fig. 7.
[8] Collins, 1937, 243.
[9] Giddings, 1952, 88, Pl. 15, Fig. 12.
[10] Mathiassen, 1927b, 115; 1927a, Pl. 29, Figs. 9–10, Pl. 38, Fig. 13, Pl. 57, Figs. 2–3.
[11] Mathiassen, 1927a, 71.

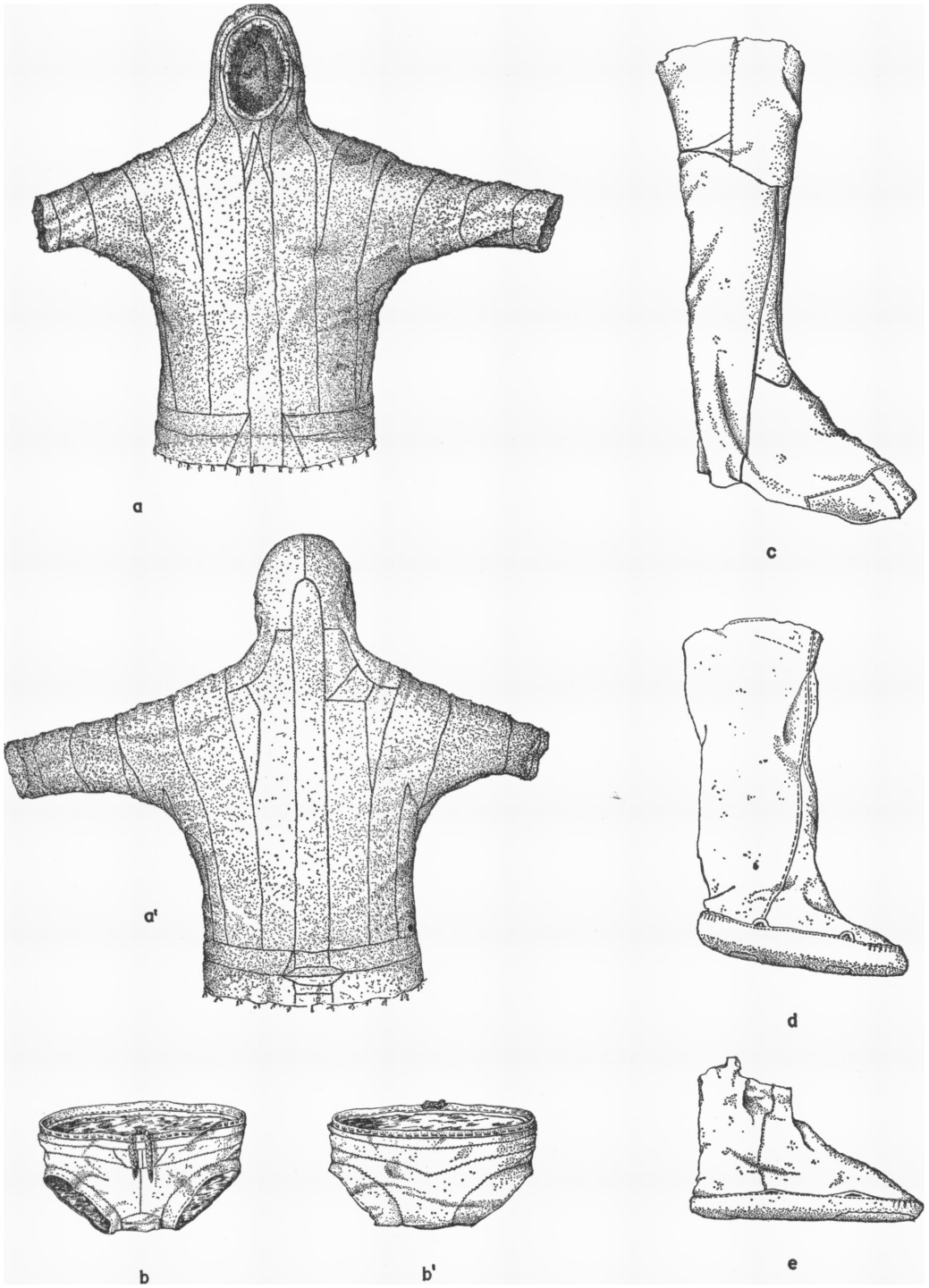


FIG. 106. Clothing from Birnirk. a–a′. Seal gut rain parka. b–b′. Furlined pants for baby. c–e. Water boots made of de-haired sealskin.

of summer waterproof boots are made with black sealskin uppers, and soles usually of *ugruk* skin. These have four small loops sewed into the welt between upper and sole to receive the tie string.

Only summer water boots were found in excavations, so it is not necessary to consider the other types further.

NUNAGIAK: No boots were found in the Utkiavik excavations. A boot sole of *ugruk* skin from Cut 1 at Nunagiak conforms to the modern type. A boot with *ugruk* sole and uppers of hair seal, with the fur turned inside, came from Entrance D beneath Mound C at this same site. On this boot four loops for the lacing

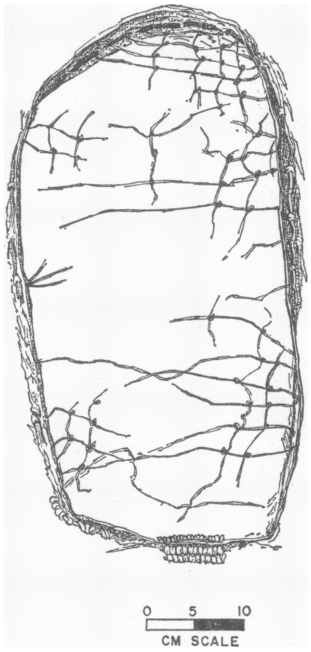


FIG. 107. Baleen rack used to hang above the lamp for drying clothing.

were made by perforating small tabs formed on the edge of the *ugruk* sole. This is the type of bootlace loop consistently found on the boots from the Birnirk Site.

BIRNIRK: Seven fragmentary water boots were found at Birnirk (Fig. 106c–e). Six with the *ugruk* soles attached show the loops made as an integral part of the soles. Patches were sewed on several soles under the heel and ball of the foot. The remnants of a birdskin sock were found in a boot sole from Cut 13, Mound J, and one from Cut 6, Mound Q.

A rain parka made of strips of seal gut sewed together vertically (Fig. 106a, a′) came from the floor of Structure D in Mound A. The hood opening and the lower edge of the garment are bordered by narrow strips of skin, apparently dog skin, with fur on it.

In this same locality a pair of child's pants was found (Fig. 106b, b′). These are for a waist about 64 cm. in circumference and are well made of sealskin, with the fur turned inside. The doubled, triangular portion of the garment which passes between the legs is made of brown sealskin; the leg openings are tastefully edged with light-colored skin strips. A de-haired and bleached sealskin strip sewed around the waist carries a braided sinew drawstring that ties in front.

A face piece for a parka, found in Mound S, Cut 6, Section 2, consists of a circular skin strip, with long, coarse, black hair, apparently dog skin.

The floor of the house in Mound C yielded two pieces of white, de-haired sealskin that had been cut into fringes, but there was no evidence that these had been sewed onto clothing.

COMPARISONS: The Birnirk type of boot contrasts with the modern Point Barrow water boot in that the lacing loops are formed in the edges of the sole, which seems to be a much more practical method of providing for this feature than that of sewing small loops onto the welt as is done at present.[1]

Unfortunately, no archeological specimens of boots seem to be available for comparison. However, present-day Greenland Eskimo use pierced tabs cut on the sole of boots for tie strings.[2]

Short pants of the type described above are not worn by recent Western Eskimo. However, this type of garment is worn by both men and women on the east coast of Greenland.[3] These garments were probably common in the West at an early date and diffused eastward with the Thule Culture.

Seal gut parkas were known on St. Lawrence

[1] I happened to be visiting an Eskimo camp near the village of Kivilina in 1936 while the women were cutting skins to make boots. They were very much interested in the old Birnirk boot sole pattern and made some of this type. It is entirely possible that boots are now being made along the Arctic Coast of Alaska according to this revived pattern.

[2] Specimens in the American Museum collections.

[3] Birket-Smith, 1928, Pt. 2, 96.

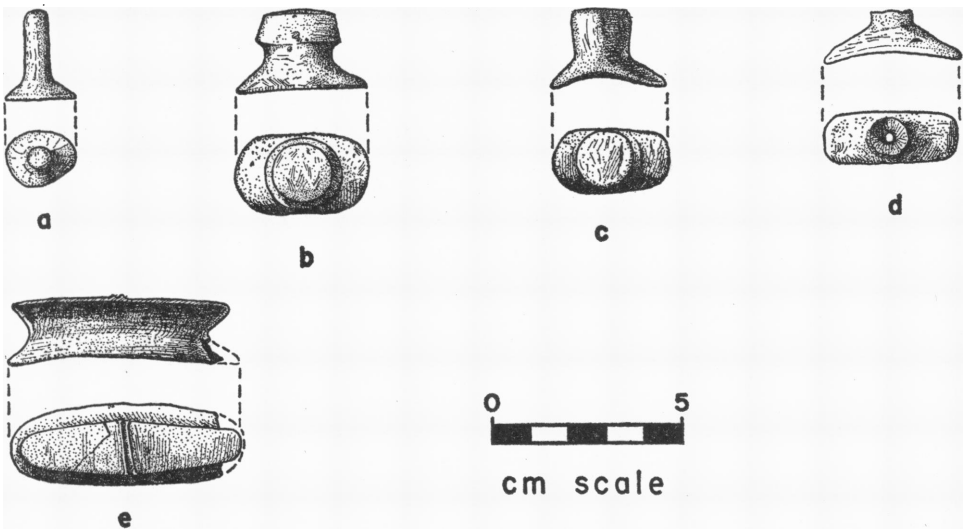


FIG. 108. Labrets from Utkiavik. a, d. Ivory. b, c, e. Bitumen.

Island at the time of the Old Bering Sea Stage. Small fragments of these garments were recovered from Miyowagh.[1]

DRYING RACK FOR CLOTHING

Racks for hanging over the lamp upon which wet mittens and socks can be placed for drying are in widespread use by modern Eskimo. Usually rectangular in the West, they are constructed by the insertion of wooden slats into mortises in two end pieces.

BIRNIRK: Only one rack for clothes drying was found in the excavations (Fig. 107). This came from Section 5, Cut 7, Mound D, at Birnirk. The rim is formed of a strip of baleen 4 cm. wide, with the ends lashed together to form an oval, 54 by 28 cm. Strands of baleen were passed through holes in the frame to form a netting with square mesh.

SLAT ARMOR

One of the types of armor in use on St. Lawrence Island during the past century was made of flat plates of ivory or antler sewed side by side to a leather jacket. A second type was made of slabs of baleen that circled the body horizontally.

UTKIAVIK: Armor slats were found at Utkiavik, which indicates that these protective garments were used in recent times. Three slats were excavated, and two were in the purchased collections. The slat shown in Fig. 111h, made of antler 18 cm. long, 2 cm. wide, and 6 mm. thick, is typical. Six holes have been drilled in it for sewing to the foundation garment.

COMPARISONS: Armor slats of this same shape and with holes arranged in the same manner first appeared on St. Lawrence Island in the Punuk Period.[2] As Hough has demonstrated, this trait was diffused from Asia, but apparently it did not spread east of Point Barrow.[3]

LABRETS

Murdoch[4] describes in detail the custom of wearing labrets. He illustrates not only the pins for enlarging the holes at the corner of the lips, but also labrets of two general types. The variety he observed in use were hat-shaped and almost round. Some labrets had blue glass beads or, more commonly, halves of beads, attached as ornaments. He also describes, but did not observe in use, a larger elongated oval type of labret, as much as 3 inches wide, which probably occupied a large hole in the center of the lower lip.

UTKIAVIK-NUWUK: Labrets, a rather common artifact in the Utkiavik and Nuwuk refuse

[1] Collins, 1937, 177.

[2] Collins, 1937, 224–225, Pl. 76, Figs. 22–23.

[3] Hough, 1895.

[4] Murdoch, 1892, 143–148.

deposits, were not found at earlier sites. One came from late deposits at Nunagiak. A selection of typical forms is shown in Fig. 108. The ivory pin (Fig. 108a) was used by young men to enlarge the holes to receive full-sized labrets. Figure 108b and Fig. 108c illustrate labrets made of black, fine-grained bitumen. An ivory specimen (Fig. 108d) originally had one of the large, blue-glass, trade beads attached to it. Half a bead, split for the purpose of being affixed to a labret, was found on the floor of House B, Utkiavik. A large oval labret (Fig. 108e) is jet black and made of the same material as the labrets shown in Fig. 108b and c.

COMPARISONS: De Laguna has discussed the distribution of labrets in North America.[1] Larsen and Rainey have considered the significance of the presence of this element in Ipiutak.[2] Everywhere in northern Alaska, with this one exception, labrets have been found only at comparatively recent sites. The best dating is provided by Giddings' Kobuk River sequence; the greatest popularity of these ornaments dates about 1700 A.D. Labrets are absent in the earlier sites that date between 1250 and 1400 A.D. Labrets from the Ipiutak Site are of the long oval variety similar to the specimen shown in Fig. 108e. Data from the Point Barrow Area add nothing to the solution of the problem of the late reappearance of this item on the Arctic Coast.

[1] De Laguna, 1934, 204.

[2] Larsen and Rainey, 1948, 114–116.

DRUMS, PIPES, TOYS, AND UNIDENTIFIED OBJECTS

DRUMS AND DRUM PARTS

Murdoch gives an excellent description of the construction and use of the tambourine drum by the Point Barrow people.[3] As is usual among the Eskimo, this is their sole musical instrument. To the present day it has survived the competition of the accordion, phonograph, and radio.

UTKIAVIK-NUWUK: The two drum rim fragments from Utkiavik conform to Murdoch's description. They are about 3 cm. wide and 1.5 cm. thick, with a rather deep groove on the outside to receive the binding that secured the drumhead. These fragments of rims are too short for their diameters to be estimated. Drum rim splice reënforcements are made of ivory and vary somewhat in the manner in which they were applied. One from Utkiavik, a flat plate of ivory, is studded with small ivory pegs by means of which it was fastened to the wooden rim. Another is a rectangular ivory sleeve into which the ends of the wooden hoop were fixed with ivory pins. A splice from Nuwuk, also of ivory, is deeply grooved at each end to receive tongues formed on the ends of the hoop. Again ivory pins were used (Fig. 111e). These splices are grooved longitudinally, so that the groove encircling the wooden drum hoop for the binding string is not interrupted.

Drum handles from the recent sites (Fig. 111e) are essentially similar to those described by Murdoch, but none has the carved faces on the end described by him. Usually made of antler or bone, or occasionally of wood, they average about 10 cm. in length and have a square notch near one end to receive the drum rim splice. Lashing holes are usually provided.

NUNAGIAK: The drum rim fragment from Cut 2, Section 3, conforms to the type, described below, from Birnirk. Two fragmentary rims for toy drums, each with a short wooden handle carved as an integral part of the rim, were obtained from the entrance to Structure D below Mound C.

BIRNIRK: A complete drum rim with handle attached was found on the floor of the entrance to House A, Mound A (Fig. 109). The hoop, 36 cm. in diameter, is scarfed and drilled for being lashed on the side opposite the handle. The wooden handle is not notched; it is inserted through a hole in the hoop and has shallow grooves in which a tightening cord was wound. A second complete drum rim came from the deposits below the floor of Structure B, Mound A. The hoop is formed of two pieces spliced on opposite sides. This drum rim is only 24 cm. in diameter.

[3] Murdoch, 1892, 385–389.

TABLE 22

DRUM PARTS

Location	Rims	Handles	Splices
Utkiavik			
House B	1	—	—
Cut 2, Section 1	—	4	1
Cut 2, Section 5	1	—	—
Location X	—	1	—
Purchased	—	8	—
Nuwuk			
Nunagiak			
Cut 1, Section 2	—	—	1
Cut 2, Section 3	1	—	—
Entrance D, Mound C	2	—	—
Birnirk			
Cut 2, Section 2	—	1	—
Floor of entrance, House A	1[a]	—	—
Below Structure B	1	—	—
Below Structure C	1	—	—
Mound J, Floor 2 of House A	1	—	—

[a] With handle.

In contrast to the rims from the later sites, which are rectangular in section and comparatively heavy, all those from the Birnirk deposits are rather small and light. They range from 1.4 to 2.5 cm. in width and are about 0.7 cm. thick. The groove for tying on the diaphragm is shallow; the edges of the rim are rounded, as is the inside face of the hoop.

A small handle made from a prong of antler, from Cut 2, Section 2, Mound A, as do the later forms, has a rectangular notch (Fig. 112h).

COMPARISONS: Remains of tambourine drums are first found in the Okvik collection, represented by the ivory handle of a toy drum.[1] The Old Bering Sea Period drums had wooden rims similar to those just described from Birnirk—narrow, with a shallow groove.[2] A single wooden handle from the Miyowagh Site was carved in one piece, with the rim like that of the two toy drums described from Nunagiak. A similar rim, with the handle carved from one piece, was obtained from the Old Bering Sea levels of the Kukulik Midden on St. Lawrence Island.[3]

It is impossible to determine from the photo-

[1] Rainey, 1941, Fig. 24, Item 14.
[2] Collins, 1937, 174, Pl. 57, Fig. 8.
[3] Geist and Rainey, 1936, Pl. 74, Fig. 9 (listed as unidentified wooden object).

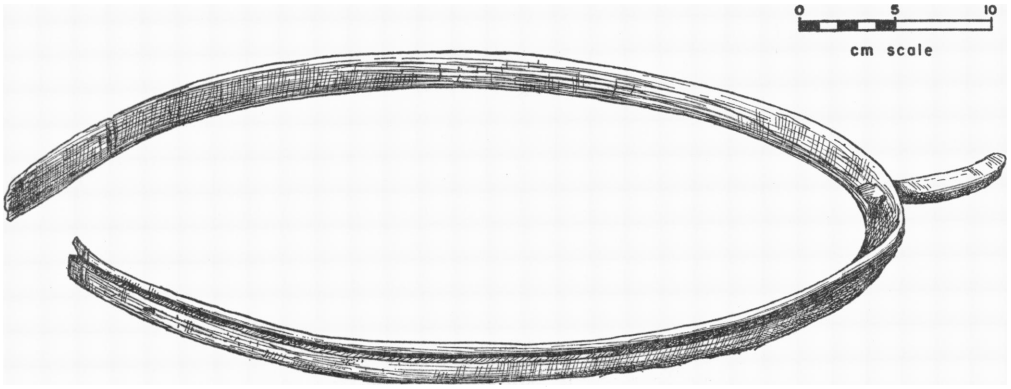


FIG. 109. Wooden drum rim and handle from Birnirk.

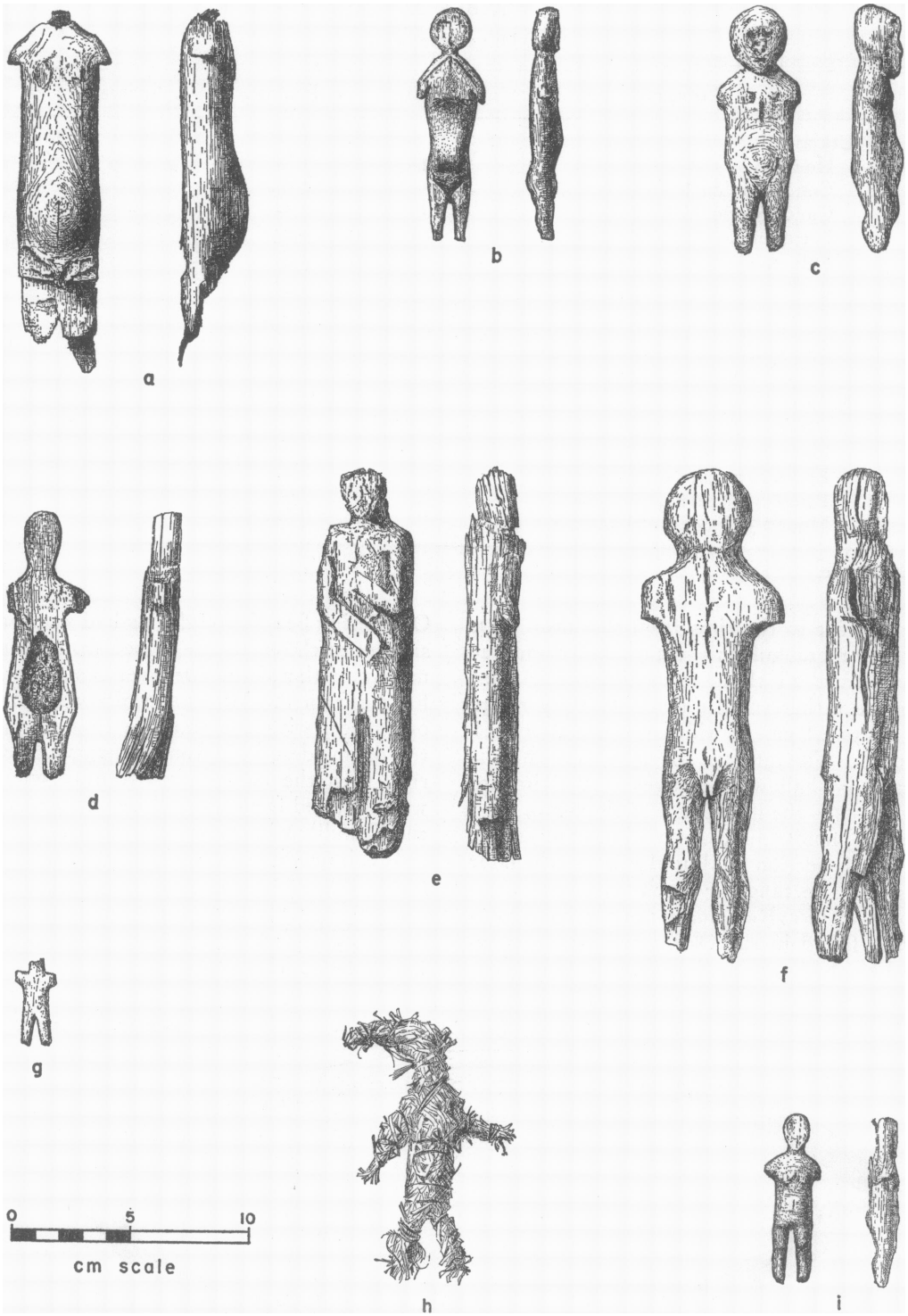


FIG. 110. Dolls from Birnirk and Nunagiak. a–g, i. Bark dolls from Birnirk. h. Grass doll from Nunagiak.

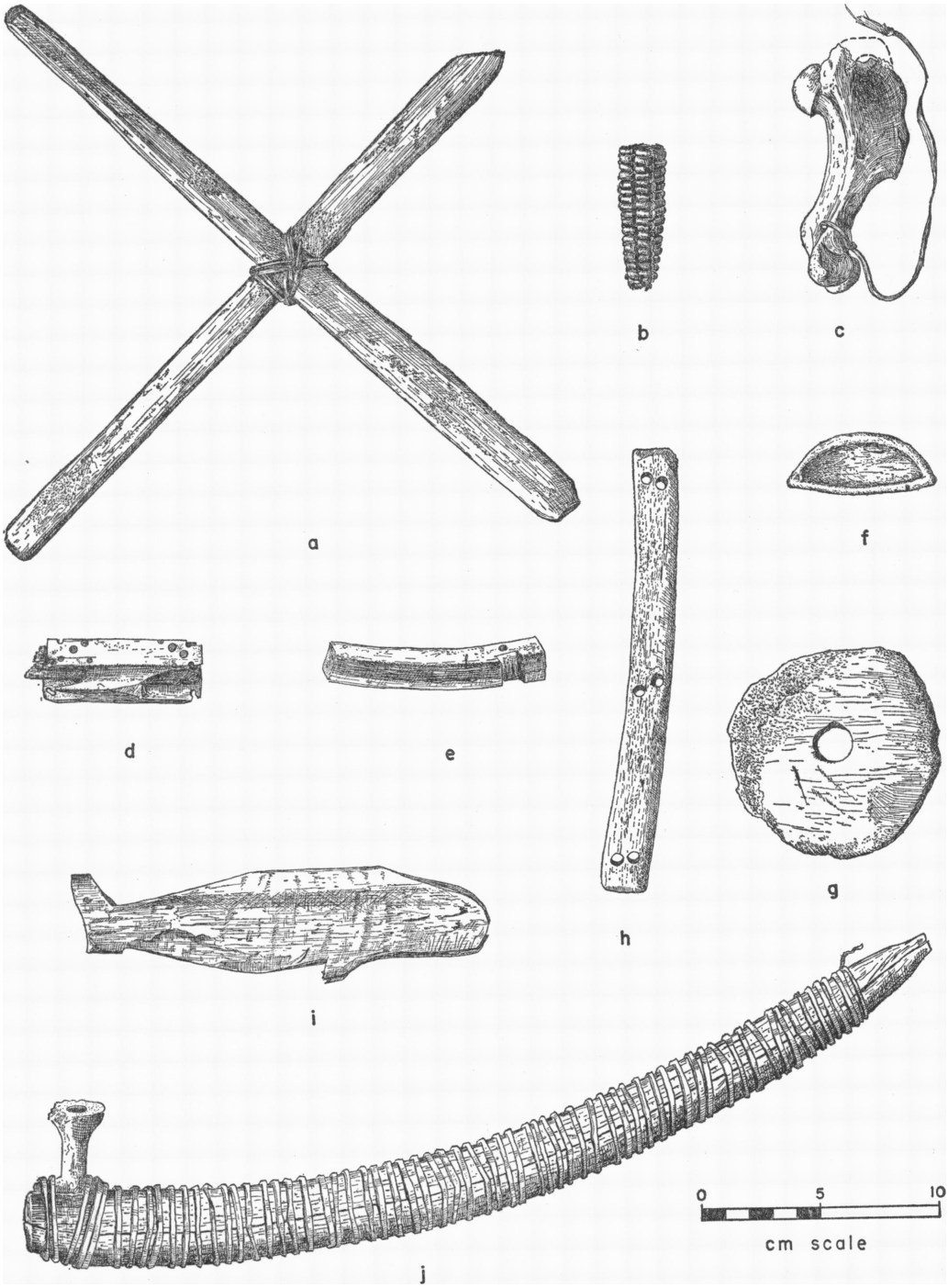


FIG. 111. Objects from Nuwuk and Utkiavik. a. Baleen cross probably used for throwing. b. Object plaited from four strips of baleen. c. Seal humerus used in cup-and-pin game. d. Ivory drum rim splice. e. Antler drum handle. f. Toy lamp made of soapstone. g. Top made of bone. h. Armor slat made of antler. i. Baleen whale effigy. j. Pipe with wood stem and ivory bowl.

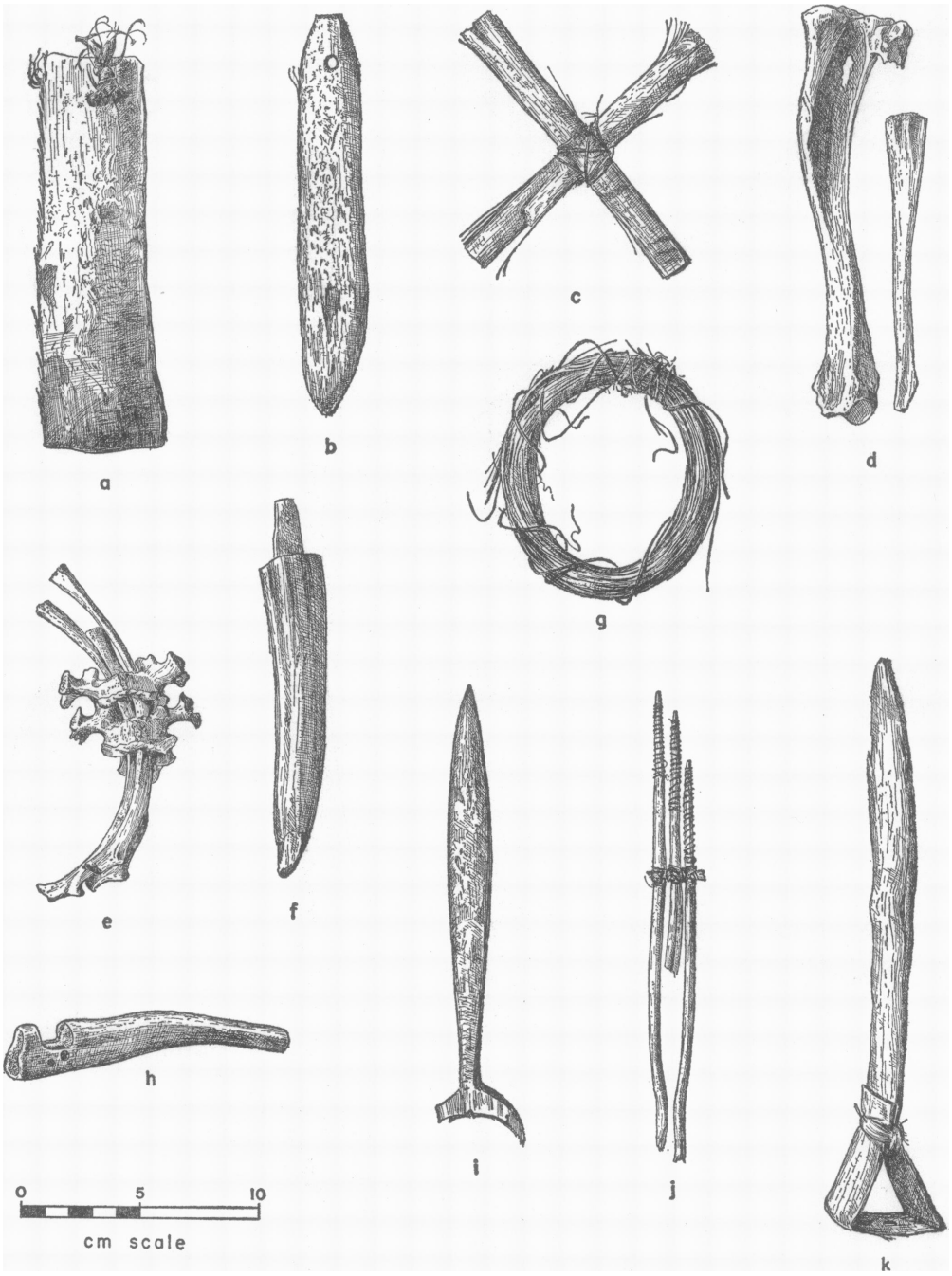


FIG. 112. Objects from Birnirk. a–b. Baleen bull-roarers. c. Baleen cross possibly used for throwing. d. Seal tibia and fibula used for cup-and-pin game. e. Seal vertebrae strung on seal ribs. f. One of a pair of young walrus tusks carved at the proximal end. g. Coil of shredded baleen. h. Drum handle made of antler. i. Baleen whale effigy. j. Possible toy fish spear. k. Swivel-like object of baleen.

graph whether the fragment of drum rim that Giddings secured from Ambler Island (date, 1730–1760 A.D.) is of the earlier or later varieties described above. The notched handle from Old Kotzebue (1400 A.D.) is of the usual pattern.[1] So far as I can discover from Mathiassen's report on the work of the Fifth Thule Expedition, parts of drums were not found. This must be the result of the sampling luck to which all archeological field-work is subject.

PIPES

Fragments of the Siberian type of pipe were found at Utkiavik and Nuwuk, always associated with metal, glass, and other evidence of European contact. A complete specimen purchased from the Eskimo diggers at Utkiavik is probably not over 50 years old (Fig. 111j). These finds are identical with the pipes collected by Murdoch.[2]

TRINKET BOXES

Murdoch illustrates small round boxes about 10 cm. high, made of sections of large bones or of antler, which were used to hold trinkets. Usually a wooden bottom was pinned in one end of the cylinder and a wooden cover fitted to the other. Frequently, a string running through a small hole in the side of the box is attached to the cover to keep it in place.[3]

Two unornamented boxes, one of antler and one of bone, are included in the purchased collection from Utkiavik. The wooden cover for one of these boxes was found in contact period deposits at Nunagiak. Evidently this is a very recent trait.

TOYS AND OBJECTS POSSIBLY USED AS TOYS

Among toys that might be preserved as archeological specimens, Murdoch describes "tops, whizzing sticks or bull-roarers, whirligigs, buzz toys, and pebble snappers.[4] The first two are widespread among the Eskimo, but the others may be either local inventions or introduced by Europeans.

UTKIAVIK-NUWUK: Toys are a rather common feature of the refuse deposits at Utkiavik and Nuwuk. Most of them are small models of tools and implements used by adults, such as bows, harpoons, kayaks and umiaks, sleds, ulus, lamps, and so forth. These models are discussed above, for they frequently offer considerable information as to the features of the full-sized tools usually found in fragments. Nevertheless, all toys found are listed in Table 23.

From the floor of House B, Utkiavik, came the epiphysis (9 cm. in diameter) of the vertebra of a small whale, with a hole drilled through the center (Fig. 111g). This undoubtedly is a top, the type that Murdoch calls a "teetotum." Six others are in the purchased collection from Utkiavik.

Another easily recognizable toy is a seal humerus with a length of baleen tied to the distal end (Fig. 111c). This is the common Eskimo pin-and-cup game, *ajagaq*.

Only three dolls were obtained from Utkiavik, all purchased. One of these, of ivory, is shown in Fig. 101 l. Two wooden heads are made to be fastened to bodies possibly made of skin (Fig. 101j–k). On a similar head from Nuwuk a triangular ornament projects from the top of the head. An obviously hastily made doll of shredded baleen is shown in Fig. 101m.

The fragment of a broken wing bone from a large bird, with a smaller bone inserted into the hollow of the larger, is a widespread feature of Eskimo sites. Possibly these are used in superstitious or playful practice similar to the European custom of pulling the wishbone. Joined bird bones of this variety were found below the floor of House A, Mound A.

NUNAGIAK: Most of the toys found at Nunagiak were bows and arrows (see Table 23). In addition there is one toy spoon, one toy ulu, and two of the curious baleen crosses that probably were used for throwing.

BIRNIRK: Most of the toys from the Birnirk Site are replicas of full-scale tools and are discussed in the foregoing pages with the full-scale tool or weapon represented.

The pin-and-cup game is represented by a seal tibia and fibula from the floor of the entrance to House A, Mound A (Fig. 112d), by a swan humerus from Structure E in the same mound, and by a drilled section of bone of a baby whale from Cut 2, Section 5.

Three bull-roarers were found: two from Mound A, Cut 3, Section 4, and one from

[1] Giddings, 1952, 90–91.
[2] Murdoch, 1892, 65–72, Fig. 6.
[3] Murdoch, 1892, 322–326, Figs. 329–334.
[4] Murdoch, 1892, 376–383.

TABLE 23

Toys

Location	Inserted Bird Bones	*Ajagaqs*	Bull-roarers	Seal Effigies	Lamps	Doll Heads of Wood	Dolls of Bark	Sleds	Pickaxes	Spoons	Kayaks	Umiaks	Bows	Arrows	Harpoon Foreshafts	Knives	Ulus	Crosses of Baleen	Seal Vertebrae on Ribs
Utkiavik																			
Above House A	—	—	—	—	—	—	1	—	—	—	—	—	1	—	—	—	—	1	—
Floor of House A	—	—	—	—	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—
Below floor of House A	1	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—
House B	—	—	—	—	—	—	—	—	1	—	—	—	1	—	—	—	—	—	—
Location X	—	—	—	—	—	—	—	1	—	—	1	—	—	—	—	—	—	—	—
Purchased	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—
Nuwuk, purchased	—	—	—	—	1	1	—	—	—	—	—	1	1	—	1	—	—	—	—
Nunagiak																			
Cut 1, Section 2	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	1	—	—
Cut 2, Section 3	—	—	—	—	—	—	—	—	—	—	—	—	1	2	—	—	—	—	—
Cut 2, Section 4	—	—	—	—	—	—	—	—	—	—	—	—	1	2	—	—	—	—	—
Cut 2, Section 6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—
Mound C																			
Cut 4, Section 3	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—
Entrance D	—	—	—	—	—	—	—	—	—	—	—	—	—	3	—	1	—	1	—
Structure E	—	—	—	—	—	—	—	—	—	1	—	—	—	4	—	—	—	—	—
Burial 1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—
Above Punuk house	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—
Miscellaneous, beach	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—
Birnirk																			
Mound A																			
Cut 2, Section 5	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cut 3, Section 1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cut 3, Section 2	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—
Cut 3, Section 3	—	—	—	—	—	—	—	—	—	—	—	—	1	3	—	—	—	—	—
Cut 3, Section 4	—	—	2	—	—	—	1	—	—	—	—	—	2	—	—	—	—	1	—
Cut 3, Section 7	—	—	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—	1	—
Cut 4, 0–18 inches	—	—	—	1[a]	—	—	—	—	—	1	—	—	—	—	—	—	—	—	2
Timbers between Structures A, E, and C	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
Roof of House A	—	—	—	—	—	—	2	1	—	—	1	—	2	—	—	—	—	—	1
Floor of entrance to House A	—	1	—	—	—	—	—	—	—	—	—	—	1	1	—	—	—	—	1
Floor of House A	—	—	—	—	—	—	1	—	—	—	1	1	2	5	1	—	—	—	—
Floor of Structure B	—	—	—	—	—	—	1	—	—	—	1	—	—	—	—	—	—	—	—
Below Structure B	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	1
Floor of Structure C	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1
Below Structure C	—	—	1	—	—	—	1	—	—	—	—	—	3	—	—	—	—	—	—
Floor of Structure D	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—
Floor of Structure E	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
Burial 3	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Below Structure E	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Mound C, floor of House A	—	—	—	1	—	—	—	—	—	—	1	—	1	—	—	—	—	—	—
Mound D																			
Cut 7, Section 3	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—
Cut 7, Section 7	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—
Mound G, Cut 8, Section 5	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—
Mound J																			
Cut 13, Section 1	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
Cut 13, Section 2	—	—	—	3	—	—	—	—	1	—	1	—	—	—	—	—	—	—	—
Cut 13, Section 3	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1
Cut 13, Section 4	—	2	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Floor 1 of House A, Cut 1	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	2
Floor 2 of House A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2
Mound R, floor of House A	—	—	1	—	—	—	—	—	—	—	1	—	—	1	—	—	—	—	—
Mound S, Cut 6, Section 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1

[a] Bark.

Mound J, Cut 13, Section 4. All were narrow rectilinear pieces of baleen pierced at one end for a string, also usually made of baleen (Fig. 112a–b).

Small dolls made of the thick pieces of cork-like bark that drift in on the beach are common at Birnirk (Fig. 110). Carved in one piece, they are from 5 to 19 cm. high. Most of the figures, which show sexual features, represent females, and some of the females are definitely pregnant (Fig. 110a–c). One doll that has split along the laminations of the bark has a cavity in the abdomen, probably made for a toy fetus.

Toy figures of whales and seals were also frequently encountered at Birnirk (Fig. 104h–i). Another bark toy is the replica of the Old Bering Sea type of winged object (Fig. 104e).

The broken wing bone of a duck, with a smaller bone inserted, was found in Cut 3, Section 1, Mound A. Considerably more common at Birnirk was a custom of stringing seal vertebrae by the insertion of several seal ribs through the foramen (Fig. 112e; Table 23). This doubtless is another custom similar to pulling the wishbone.

COMPARISONS: Toys were a fairly prominent element of the Okvik Culture of St. Lawrence Island. These were principally miniatures of adult equipment carved in ivory: toy sled runners, paddles, harpoon parts, and drum handles.[1] Human figures usually carved of ivory were rather numerous, generally with the face sculptured and the body represented by an unshaped block.[2]

Toy umiaks, kayaks, sleds, and bows are found in the Old Bering Sea Period deposits of the Miyowagh Site[3] and continue in use through the Punuk Period. Bark dolls representing females and the joined twin whale figures like the one illustrated in Fig. 104 l, small replicas of the late Old Bering Sea Period winged objects similar to Fig. 104e, were also found at Miyowagh. Seal humeri used as *ajagaq* are found at this site[4] and are also an element of the Thule Culture.[5] The Eskimo of the Punuk Period has the custom of inserting small long bones into the broken end of bird wing bones.[6]

[1] Rainey, 1941, Fig. 24, Items 7–16.
[2] Rainey, 1941, Figs. 28–30.
[3] Collins, 1937, 178, Pl. 59.
[4] Collins, 1937, 179.
[5] Mathiassen, 1927b, 119.
[6] Collins, 1937, Pl. 81, Figs. 15–16.

Tops, which first appear at Point Barrow in the Utkiavik deposits, are considerably older on St. Lawrence Island; they first appear in the Old Bering Sea Period.[7]

Curiously enough, the small bird figures common in the Punuk Period of the Bering Strait Region[8] and in the Thule Culture sites are not found in the Point Barrow Area.

Dolls, the game of *ajagaq*, tops, and bull-roarers are characteristic of the Thule Culture sites of Northern Canada.[9]

MISCELLANEOUS BALEEN OBJECTS

The quantities of baleen, as well as the whale bones that are so common at the series of sites in the vicinity of Point Barrow, demonstrate the importance of whaling to the prehistoric Eskimo. Most of the baleen is in the form of scrap; the material, however, was extensively utilized in a number of different ways, as is described in the preceding pages. Under the above heading several objects are here described that are not readily classified or the use of which is unknown.

UTKIAVIK: Knots made in narrow strips of baleen are present in almost every level of the limited excavations at Utkiavik, but in most instances it is impossible to determine their use.

Several objects, possibly ornaments, are made by the braiding of four narrow strips of baleen (Fig. 111b). One of these came from below House A; the other two were purchased.

Another interesting specimen in the purchased collection is a baleen wolf-killer, a strip of baleen with pointed ends folded into an S shape and neatly tied. These devices are described by Murdoch,[10] but have not been found at any of the earlier sites in the Point Barrow Region or in any other parts of the western Arctic.

Three silhouettes of whales cut from baleen are in the collection purchased from Utkiavik (Fig. 111i).

Three crosses were found. These were made by the lashing together of narrow slabs of baleen (Fig. 111a) and are probably throwing devices, either toys or for the killing of small birds.

[7] Collins, 1937, 178.
[8] Collins, 1937, 244; Mathiassen, 1927b, 117–118.
[9] Mathiassen, 1927b, 118–120.
[10] Murdoch, 1892, 259–260, Fig. 258.

BIRNIRK: Baleen knots are also common at Birnirk. Some of the narrow strips with simple knots are probably snares for small birds or animals.

A single, four-strand, braided object, identical to objects described above from Utkiavik (Fig. 111b), was found above the floor of House A, Mound R. Also from the floor of the same house a small coil of narrow baleen strips (Fig. 112g) was evidently prepared for use as lashing.

Two curious objects are made of baleen strips about 2 cm. wide and 30 cm. long. One end is formed into a triangle and securely lashed (Fig. 112k). There is a hole in the base of the triangle. The opposite end of one of these objects is perforated; on the other, the comparable end is notched. These may be parts of swivels, but they do not appear to be strong enough to have served to secure dogs as are the later swivels made of bone. One of these objects is from below the floor of Structure B, Mound A; the other, from Section 5, Cut 2, in the same mound.

Crosses made by the lashing together of two strips of baleen were also found at Birnirk (Fig. 112c).

Two baleen cut-outs appear to represent whales (Fig. 112i).

COMPARISONS: Baleen knots are common in all the Western Eskimo cultures of Old Bering Sea date and later; consequently they have only a generalized significance in indicating relationships. They are also a feature of the Thule Culture of Canada.

The four-strand plaited objects mentioned above from Utkiavik and Birnirk are paralleled by two similar objects from the Miyowagh Site on St. Lawrence Island.[1] Also from this site are two baleen cut-out objects similar to the one from Birnirk (Fig. 112i). I have thought that these were whale effigies, but Collins' interpretation of them as toy canoe paddles may be correct.[2] The later silhouettes of whales found at Utkiavik are fatter and are more realistic representations.

Bull-roarers are a trait shared by Birnirk and the Thule Culture.

UNIDENTIFIED OBJECTS

UTKIAVIK-NUWUK, NUNAGIAK: A number of unidentified objects in the collection from Utkiavik and Nuwuk are either fragmentary or too nondescript to merit illustration. In all probability some of the items described in the foregoing pages should have been placed in this category, for some of the identifications are doubtful, to say the least.

BIRNIRK: Because of the greater importance of the Birnirk Site it is worth describing the few unidentified objects; besides, the objects themselves are more interesting. Illustrated as Fig. 112j are three carved wooden rods lashed together side by side. The ends are sharpened, and each is wrapped with fine baleen string. This apparently is neither a tool nor a weapon intended for use; perhaps it is a toy fish spear. One of a pair of young walrus tusks found together below Structure H, Mound A, is shown in Fig. 112f. The proximal ends of these tusks have been cut off square, except for a tongue-shaped projection on the inside edge of each. Evidently this pair of tusks has been attached to some object at the proximal end.

A fragment of birchbark torn on three edges is from Mound Q, Section 2 of Cut 6. The fourth edge, cut straight, has attached to it three courses of looped netting made of baleen string. This is not illustrated.

[1] Collins, 1937, 172, Pl. 56, Figs. 8–9.

[2] Collins, 1937, 179, Pl. 56, Figs. 5–6.

CONCLUSIONS

ARCHEOLOGISTS CONCERNED WITH Eskimo prehistory have had since 1930 a rather clear idea as to the content and relative time position of the cultural chronology of the Point Barrow Area, at which time the sequence discovered by Collins at Gambell, St. Lawrence Island, outlined the prehistory of the Western Eskimo. This evidence, combined with Mathiassen's earlier work on the Thule Culture of the Canadian Arctic, made it possible to interpret the collections made by Stefánsson, Van Valin, and Hopson with considerable confidence.[1] The work of Larsen and Rainey at Point Hope and Giddings' dated sequence on the Kobuk River provided confirmation of these interpretations. The present paper, then, is offered in further confirmation of what is already known; there are few new conclusions.

I feel fortunate that it is unnecessary here to concern myself with the controversial question of the origins of Eskimo culture or to choose among the almost equally convincing arguments of Collins, Larsen, or Rudenko. If these pages could have been written 20 years ago, the task would have been much simpler. It seemed clear then that Eskimo culture stemmed from Asia, probably about the beginning of the Christian era, and following a long development in Alaska spread eastward in the form of the Thule Culture. The little-known Cape Dorset Culture was the sole fragment of evidence that did not fit into this economical outline.

Since the mid-thirties a number of new discoveries have not only added depth to Eskimo prehistory but have also posed a new set of problems, most of which can as yet be only partially solved.

First among these was the discovery of the Ipiutak Culture at Point Hope. This culture is obviously older than the cultures represented in the series of sites described here and, judging from the evidence, must precede the Old Bering Sea Culture of the Bering Strait Region. In comparative diagrams it is here equated in age with Okvik, but its relation to the other cultures of the Western Arctic is not entirely clear.

The second new factor has been the discovery of an old micro-flint industry at stations scattered across the American Arctic from the Aleutians to western Greenland.[2] This mesolithic-like culture, apparently dating as early as the third or fourth millennium before Christ, has certain tool types in common with early Eskimo and is probably, in part, ancestral to that culture.[3]

Finally, we have new information concerning the Cape Dorset Culture based on recent work by Collins and Meldgaard in the Canadian Arctic[4] which has revealed the length and importance of the Dorset cultural phase.

In making comparisons and drawing conclusions I continue to limit my attention to the cultural periods that are not only geographically adjacent to the Point Barrow Area, but seem also to be closest to the time periods defined there. Major attention is directed to the St. Lawrence Island sequence and to Mathiassen's data from Central Canada. Giddings' sequence for the sites along the Kobuk River is particularly valuable for the tree-ring dates he has provided, but the limited size of the collections makes statistical comparison impossible and the significance of the absence of traits uncertain. The work of Larsen and Rainey on the post-Ipiutak cultural periods at Point Hope also falls into this category.

[1] Collins, 1937, 367–372.

[2] For a recent summary, see Wormington, 1957, 207–218.

[3] Collins, 1951; Harp, 1953.

[4] Collins, 1956; Meldgaard, 1955.

COMPARISON OF HARPOON HEAD CHRONOLOGIES FROM BERING STRAIT TO CENTRAL CANADA

The sequence, relative quantities, and probable lines of development of harpoon heads in the Point Barrow Area are discussed in a preceding section (p. 93). The data on harpoon heads given in the reports[5] of Collins, Rainey, Larsen and Rainey, and Mathiassen make it possible to compare the relative popularity of

[5] Collins, 1937; Rainey, 1941; Larsen and Rainey, 1948; Mathiassen, 1927a, 1927b.

the several harpoon head forms in addition to the usual method of comparison of forms. On the basis of the information available in 1935, Collins has made an excellent comparative analysis of harpoon head development in the Eskimo Area. This analysis included the collections described in the present paper which were in his care at the Smithsonian Institution.[1] Field-work reported since 1935 has corroborated all of Collins' deductions regarding the evolution of harpoon heads. Since Collins' discussion was published, not only has our knowledge of Eskimo prehistory been augmented by the discovery of the Okvik and Ipiutak cultural stages, but a much clearer picture of the development of Eskimo culture in northeastern Siberia has resulted from the work of Soviet archeologists.

In the following attempt to trace the evolution of harpoon heads, I use a quantitative graphic device first applied to prehistoric ceramic chronologies in Southeastern United States.[2] The construction of a similar diagram based on Mathiassen's report on the sites in the Central Region was somewhat more difficult, for the information is not summarized in tabular form. The descriptive text was read carefully and the occurrence of the various types was listed, but the totals at which I arrived do not always agree with the number of harpoon heads that, according to Mathiassen, came from specific sites. However, my totals are close, and there is probably no gross distortion in percentages.

The total number of harpoon heads from only three of Mathiassen's sites was large enough to promise reliable percentages. These were Naujan (60), Qilalukan-Mitimatalik (49), and Kuk, with the rather dubious total of only 23 harpoon heads. These small numbers do not seem to justify any attempt at separating older and more recent portions of sites such as Naujan which clearly has a sequence of house groups. Again, this is admittedly rather crude seriation; but the results seem to agree with Mathiassen's conclusions: Naujan is the oldest site.

The three quantitative chronologies were compared, and what appear to be the principal lines of development were selected. These evolving series[3] are:

1. Side blades or barbs at right angles to the line hole
2. Side blades or barbs in the same plane as the line hole
3. Slit for slate blade in the same plane as the line hole
4. Slit for slate blade at right angles to the line hole
5. Closed socket harpoon heads

The first four groups of harpoon heads have open sockets on all of the earlier forms, and only the very recent types have closed sockets. However, the closed socket is not a late Eskimo invention. A variety of closed socket forms occurred in minor frequencies in the earliest known sites and continued in use in the Bering Strait Region. The closed socket group was set up to show this. As this last group is defined on a different basis from the first four, there is some overlapping of harpoon head types. The late closed socket forms included in the first four groups are also included in this fifth category.

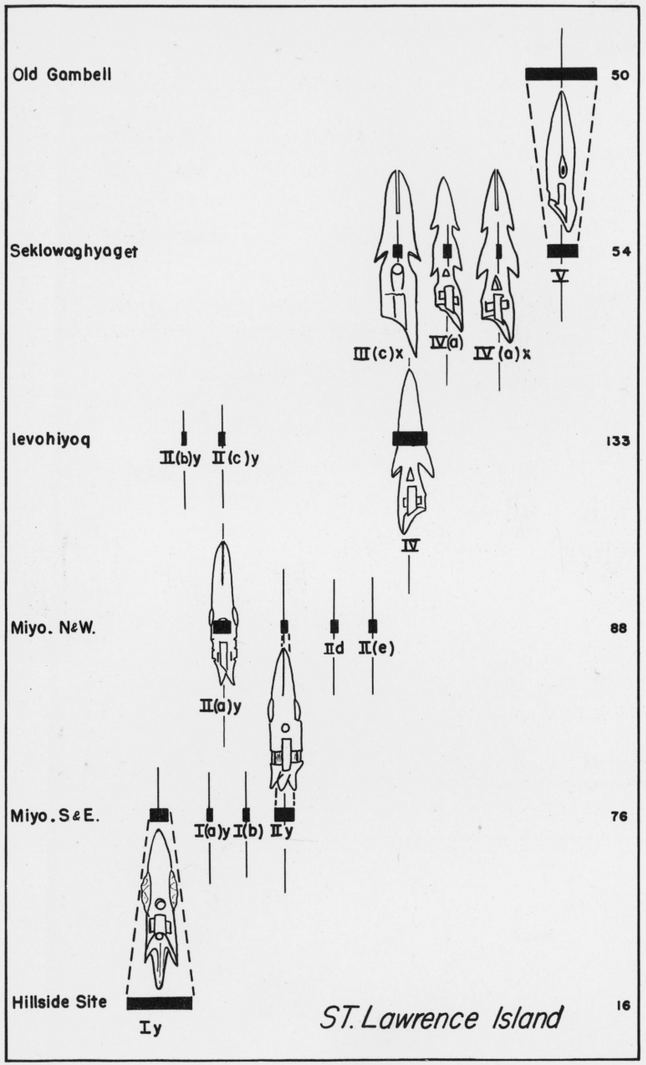
Each of the five series is illustrated by a diagram identical in plan (Figs. 113–117). The box to the left represents the Gambell, St. Lawrence Island, chronology; the Point Barrow chronology is in the center; to the right are three of the Thule Culture sites of Canada. Where pertinent forms are missing from an area the corresponding column has been eliminated; for example, the Canadian Area in Fig. 114. The localities are shown on the map in the right-hand corner of each diagram. Within each of the boxes representing the three chronologies, site names are shown on the left-hand side, and the total number of harpoon heads from which type frequencies are derived are aligned on the right. These totals indicate the reliability of the percentages that are derived from them. The type designations are given. A sketch illustrates the principal features of each type.

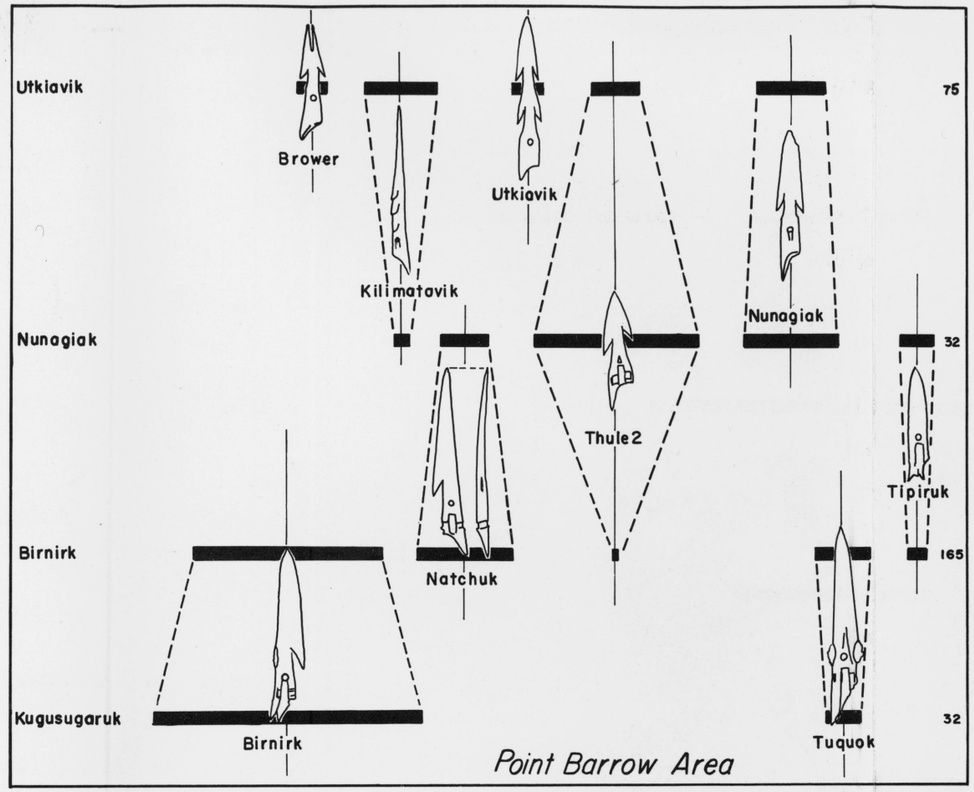
The lengths of the horizontal bars, centered on the type name and illustration and opposite the site name, indicate the percentage of occurrence of the type within the site. The per-

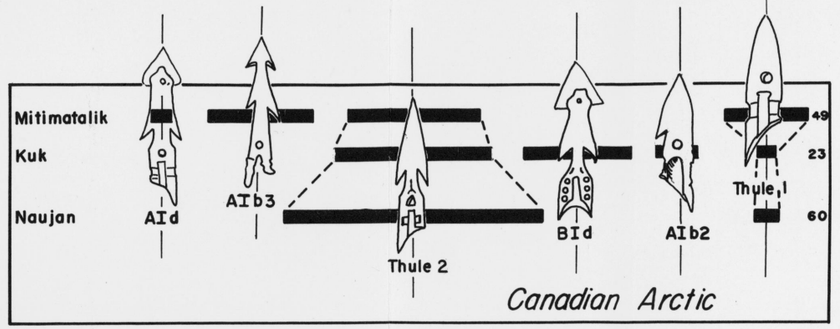
[1] Collins, 1937, 306–321.

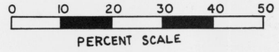
[2] Ford, 1952. A brief discussion of the advantages and limitations of this method of graphic presentation is given in this paper; these remarks apply equally as well to harpoon heads as to pottery.

[3] The term "series," used here in a sense analogous to family or lineage in biology, follows Colton and Hargraves (1937). It does not refer to a group of associated and presumably coeval types, a sense in which the term has recently been used by several American archeologists.









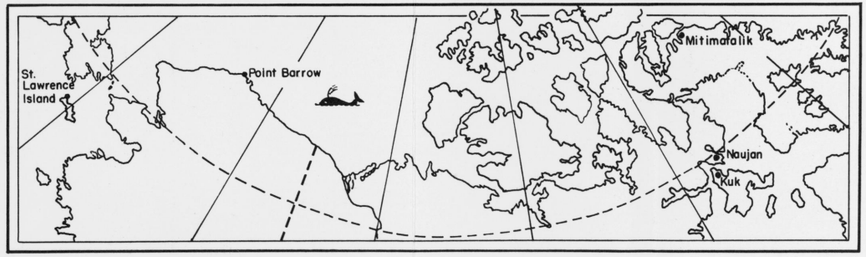
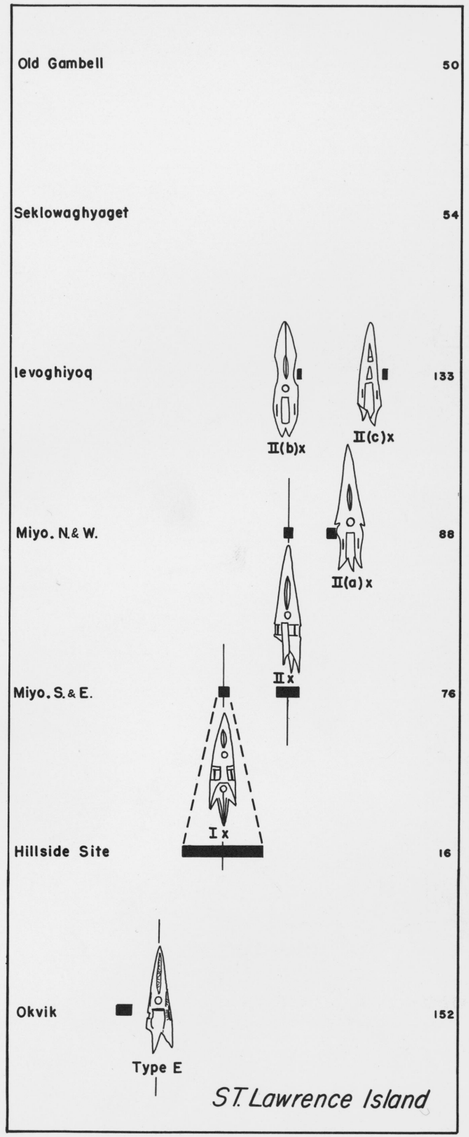
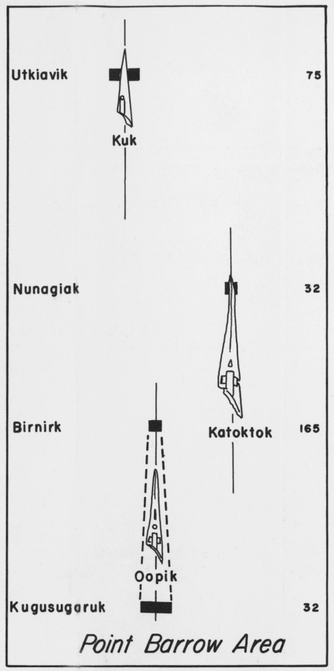
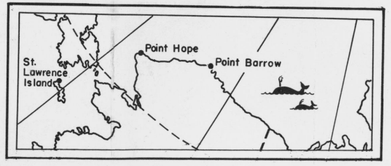


FIG. 113. Comparison of the chronologies of harpoon heads with stone side blades or barbs placed at right angles to the line holes.







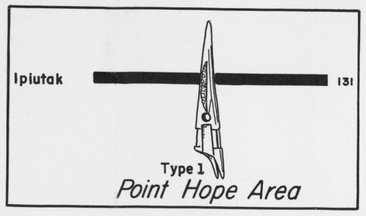
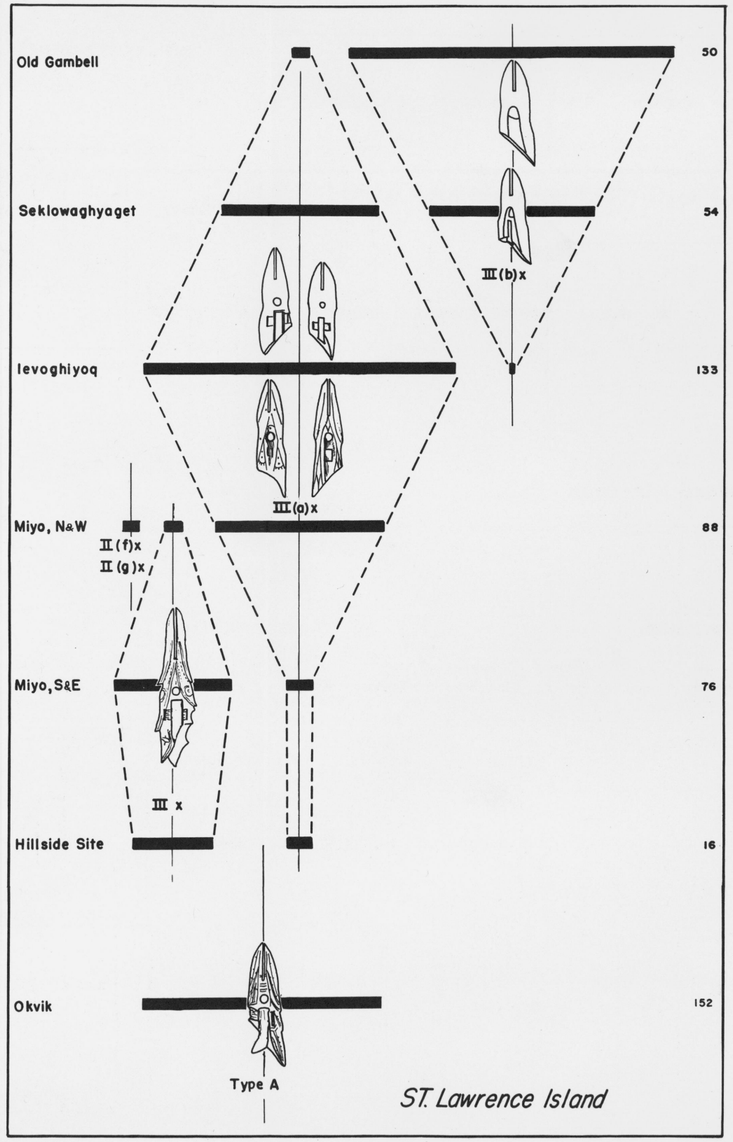
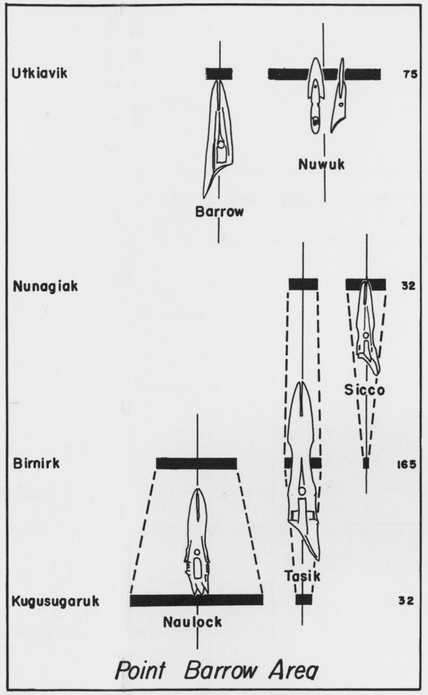
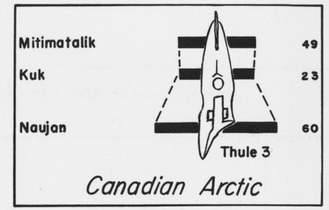
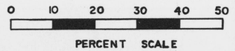


Fig. 114. Comparison of the chronologies of harpoon heads with side blades in the same plane as the line holes.









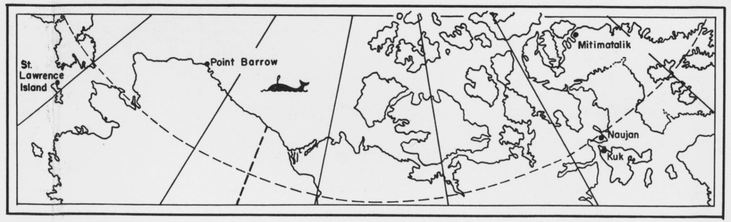
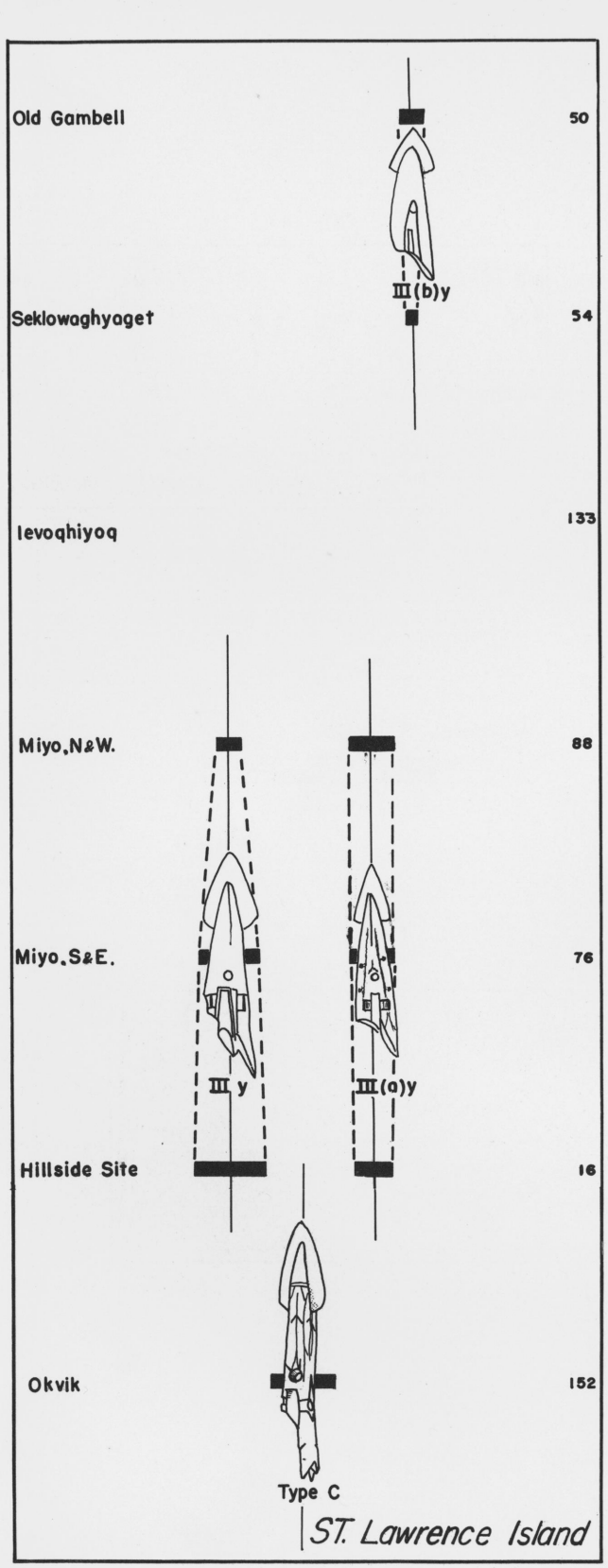
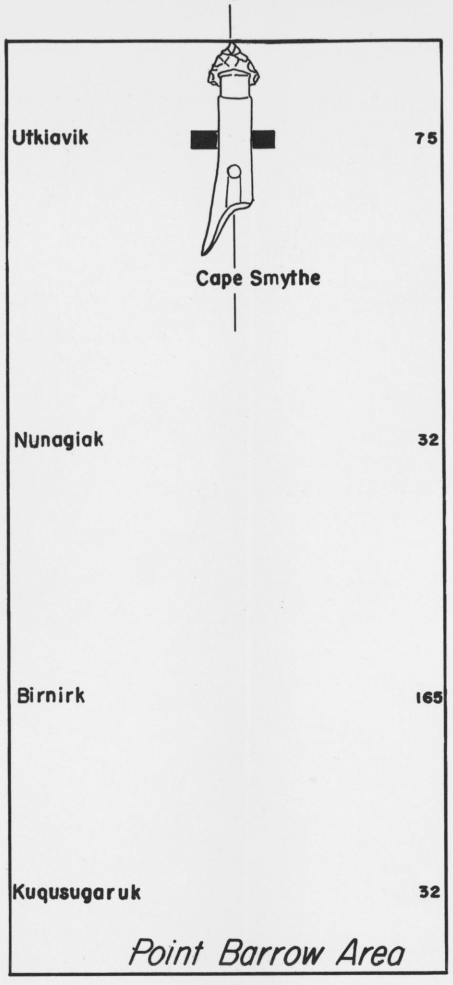
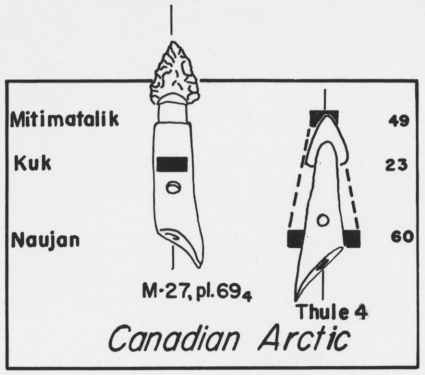
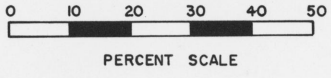


Fig. 115. Comparison of chronologies of harpoon heads with slate for blades in the same plane as the line holes.









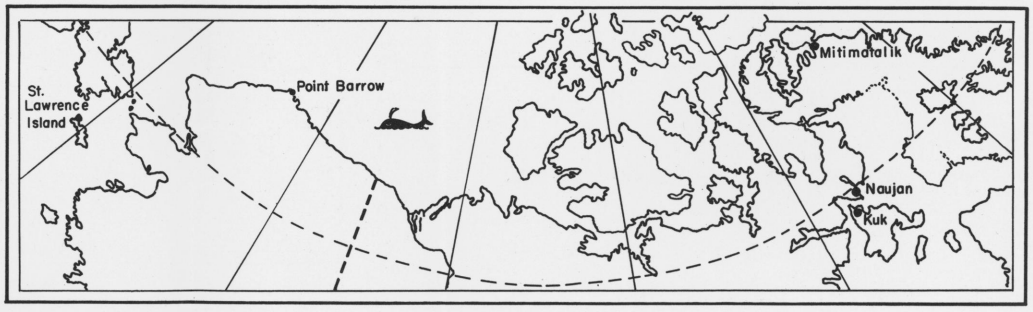
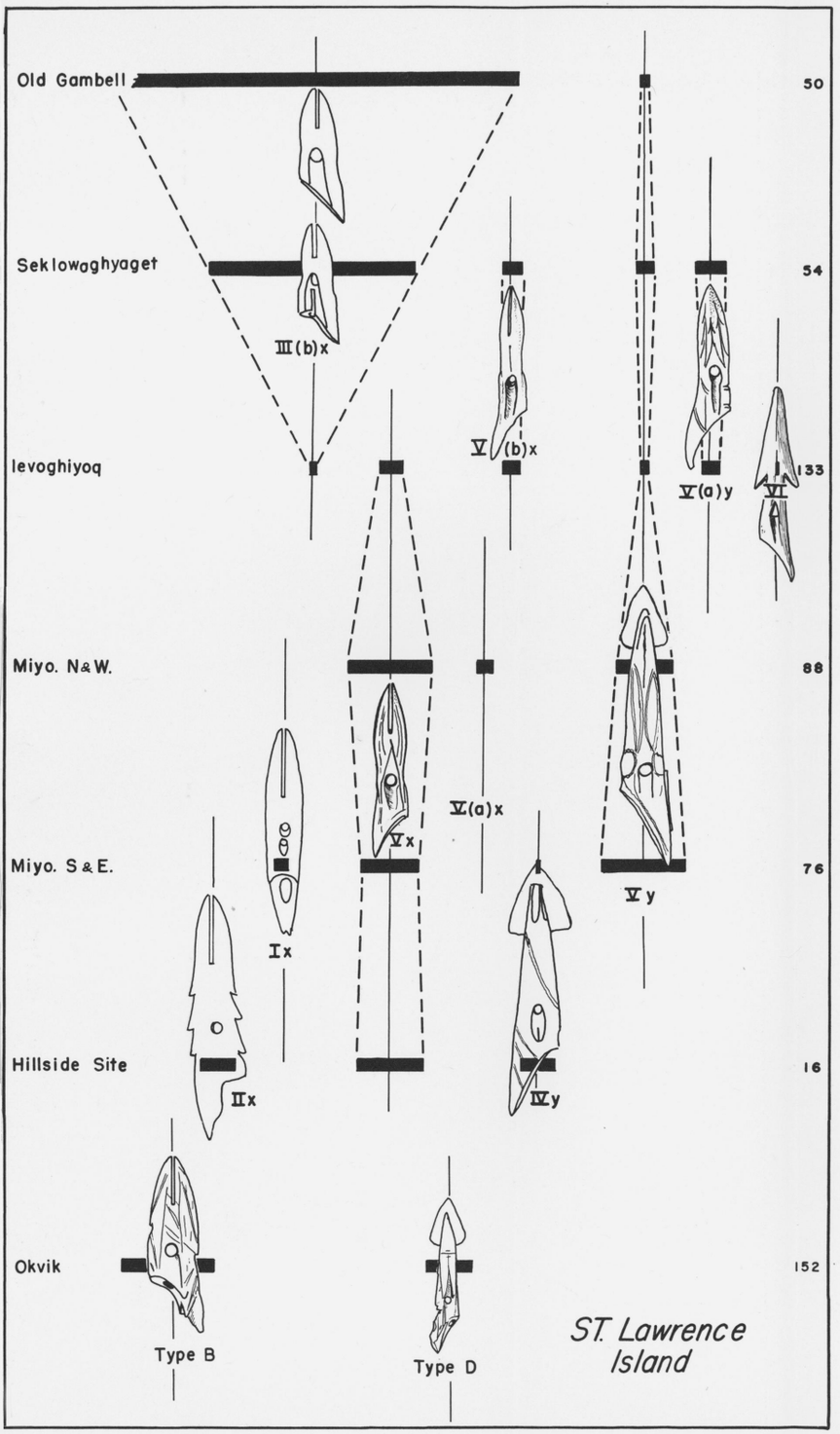
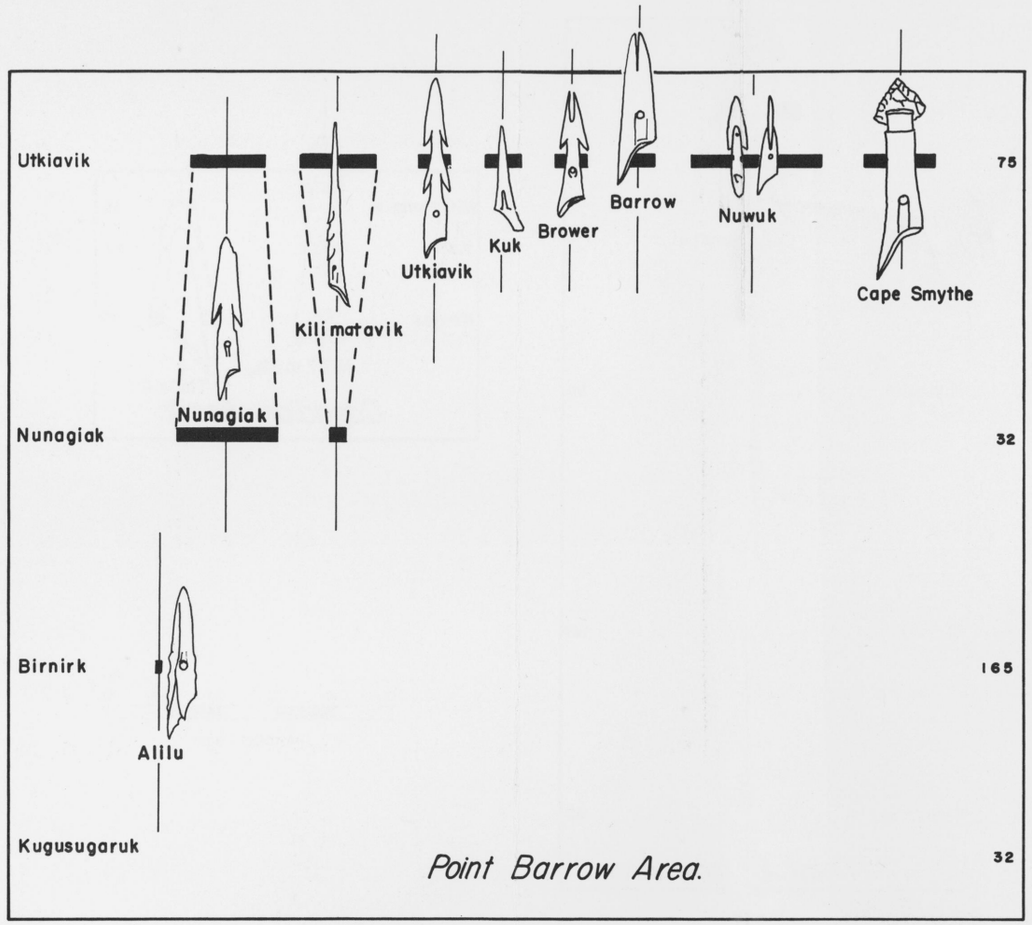
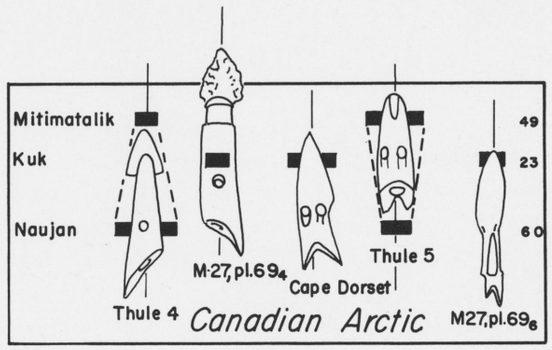
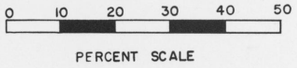


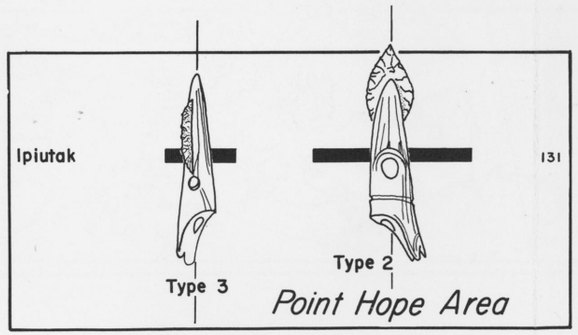
FIG. 116. Comparison of the chronologies of harpoon heads with slits for the blades at right angles to the line holes.











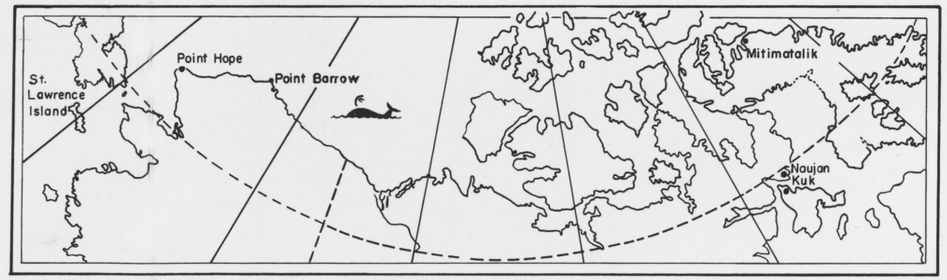


FIG. 117. Comparison of the chronologies of closed socket harpoon heads.

centage scale by which these bars may be measured is on the right of each diagram.

Harpoon Heads with Stone Side Blades or Barbs at Right Angles to the Line Hole

Figure 113

The ancestral form for this series dates in the Old Bering Sea Period of St. Lawrence Island. Stone side blade harpoons of the earlier Ipiutak and Okvik cultural stages, with the blades in the same plane as the line hole, are discussed below. The early form, Collins' Type Iy with trifurcated symmetrical spur and usually two line holes, decreases in popularity through the Old Bering Sea Period. It develops into Type IIy by a flattening of the round cross-section into a lanceolate point, the elimination of one line hole, and the asymmetrical placement of the spurs. This derived type decreased from a frequency of 4 per cent in the older deposits at Miyowagh to 2 per cent in the later midden. A more recent form of this development from Miyowagh is Type II(a)y which is still flatter in section, has only two points to the spur, and has occasionally a lashing groove in place of one slot.

In the Point Barrow Area, Tuquok is the harpoon head type directly comparable to Type IIy of St. Lawrence Island. This increases in popularity from 7 per cent at Kugusugaruk to 11 per cent at Birnirk. By elimination of the stone side blades, by occasional retention of non-functional slits as ornaments, and by reduction of the number of points to the spur, Tuquok develops into Tipiruk. This has a frequency of 4 per cent at Birnirk and increases to 7 per cent at Nunagiak. In the Canadian Thule Culture sites, Thule Type 1, although more crudely made, resembles Tipiruk in essential features. Thule 1 increases from a popularity of about 5 per cent at Naujan to one of 17 per cent at Mitimatalik. A similar late increase in popularity occurs for the related form on St. Lawrence Island. This is Collins' Type V (Seklowaghyaget, 6%; Old Gambell, 14%).

It will be noted that throughout the series just traced above, the frequencies of occurrence of the comparable types are similar, either a little more or less than 10 per cent. There seems to be no over-all tendency for marked increase or decrease of popularity.

The type Birnirk, with a frequency of 53 per cent at Kugusugaruk and one of 37 per cent at Birnirk, obviously belongs in the series under discussion, but the reason for replacing the stone side blade on the side opposite the spur by a powerful barb is not apparent. The explanation may be found along the north coast of the Chukchi Peninsula where this type seems to be rather common. The strange fact is that this type, so common on the Arctic Coast of both the Alaskan and Siberian sides of the Strait, was not found on St. Lawrence Island.

Jørgen Meldgaard has informed me verbally that both single and opposed barbs are found on the harpoons of the pre-Dorset Culture which he has recently investigated on raised beaches at an extensive site near Iglulik on Melville Peninsula.[1] Radiocarbon dates for later deposits give reason to believe that this culture may be as much as 3000 years old, which offers the possibility that the feature of barbs derives from old cultures that existed to the east of the Point Barrow Region. A similar possibility exists in regard to the Type Naulock harpoon head, as is discussed below.

In a conforming to trends in vogue, the elimination of the stone side blade and simplification of the multipointed spur changed the Type Birnirk into the Natchuk form (Birnirk, 19%; Nunagiak, 9%). This in turn was a stage in the evolution of the Thule 2 form attained by the addition of a second barb and frequent changing of the line hole to a triangular form. This has a maximum popularity of 33 per cent at Nunagiak. The type evidently diffused westward to St. Lawrence, where it has a popularity of 6 per cent at Ievoghiyoq. Thule 2 was evidently carried into Central Canada by the movement of people; at the oldest site, Naujan, it has a frequency of 52 per cent. Here it was the dominant type, as it was at Nunagiak.

After this initial diffusion, several parallel modifications occurred in the three areas. Sockets became closed (Type Nunagiak); more than one pair of barbs appeared (Types IVa, Utkiavik, Kilimatavik, AIb3); and slits for slate blades were added [Types III(c)x, Brower, AId, BId].

Rare in the Thule Culture sequence is Type

[1] For a preliminary report, see Meldgaard, 1955.

AIb2, a single barbed form that Mathiassen considered to be a variant of Thule Type 2. Actually this type retains the features of the Natchuk Type of the Point Barrow sequence.

These data seem to leave little doubt as to the mode of evolution of the characteristic Thule Type 2 harpoon head. Relative popularities, as well as comparison of features, indicate that it developed from earlier forms on the north coast of Alaska.

Harpoon Heads with Side Blades in the Plane of the Line Hole

Figure 114

Throughout most of the two Western chronologies harpoon heads with side blades inserted in the same plane as the line hole are rare. This lack of popularity probably explains why no harpoon heads related to this series have been found in the Canadian Arctic. The greater frequencies occur in the earlier types, and the decline in the popularity of this series parallels the increase in popularity of the heads with stone side blades set at right angles to the line hole and derived forms (Fig. 113).

The small harpoon heads, round in section, with "awl-shaped" points that Larsen describes as Type 1 at the Ipiutak Site constituted 55 per cent of the collection. A similar type, Rainey's Type E from the Okvik Site, forms only 4 per cent of that assemblage, which suggests that this variety was introduced into the Western Eskimo Region by the Ipiutak Culture and that the frequencies of related forms in Okvik are the result of diffusion, and a rather weak diffusion at that. The impact of the variant on Old Bering Sea Period forms was stronger: Type Ix, 19 per cent at the Hillside Site, decreases to 3 per cent in the older section of Miyowagh. The round cross-section of this type may have been derived from the similar cross-section of the Ipiutak Type 1 heads. This is a feature shared only with Collins' Type Iy which also dates early in the Old Bering Sea Period. All other harpoon heads in the Western Arctic have oval, angular, or diamond-shaped cross-sections.

Elimination of one line hole and the asymmetrical placement of the three-pointed spur produced the St. Lawrence Type IIx which has a frequency of about 5 per cent in the older deposits at Miyowagh and 3 per cent in the later. On St. Lawrence Island the tradition disappears in Punuk times in the form of Types II(a)x, II(b)x, and II(c)x, all occurring with a popularity of less than 2 per cent.

The oldest form in this series in the Point Barrow sequence is Oopik. At Kugusugaruk this type has a frequency of about 7 per cent, not very much different from the popularity of the St. Lawrence Island Type IIx, which Oopik most closely resembles. Oopik frequency at Birnirk is about 3 per cent, and by elimination of the stone side blades it evolves into the Katoktok Type.

Kuk, the type that occurs at Utkiavik with a frequency of about 7 per cent, may be related to this series, but the connection is not clear. This type is flat on the side opposite the spur, so that the blade edge is in the same place as the line hole.

Open Socket Harpoon Heads with Blade Slit in Same Plane as Line Hole

Figure 115

In the St. Lawrence Island sequence the category of open socket harpoon heads with slit for a slate blade in the same plane as the line hole is the most popular type at all periods. Type A harpoon heads comprised 56 per cent of the collection at the Okvik Site. These bear two styles of the simple Okvik engraved designs and have elaborate multiple-pointed spurs and open sockets flanked by one lashing slot and one lashing groove. Strangely enough, there is no comparable type in the Ipiutak collection. At the Hillside Site the popularity of this general class drops to a total of 25 per cent: 19 per cent of Type IIIx and 6 per cent of Type III(a)x. Type IIIx is the most graceful of the Old Bering Sea harpoon head types. It has multipointed spurs and two lashing slots for the open socket and is usually decorated with beautiful curvilinear engraving, consisting of deeply scored lines, light lines, dotted lines, and free-hand circles. The design is applied so that it conforms to and supplements the form of the harpoon head.

Open socket heads with the blade slit in the plane of the line hole reach their greatest frequency with Type III(a)x, 73 per cent at Ievoghiyoq. This head has a single pointed spur, and the small ornamental barbs that were a usual feature of the Old Bering Sea Type IIIx

have been eliminated. The harpoon heads early in the frequency cycle of Type III(a)x have Old Bering Sea style decoration; those from the northern and western side of Miyowagh and some of the heads from Ievoghiyoq have Punuk designs, but as this type declined in popularity most of the heads are plain. The recent and modern St. Lawrence Island harpoon heads have semi-closed and closed sockets. These are listed as Type III(b)x.

The earliest member of this series in the Point Barrow Region is the Naulock Type. Naulock is always made of antler and in form appears to be a simplified version of the Old Bering Sea Type IIIx. The asymmetrical spur is usually trifurcated, but the outlines of the spurs are much simpler than those of the Old Bering Sea type. A pair of small ornamental barbs opposite the line hole are emphasized by incised lines that lead from the base of the barbs towards the base of the blade slit. This represents a retention of the central element of the more ornate decoration found on Type IIIx.

This apparently clear evidence of development of the second most popular harpoon head type of the Point Barrow Area may also be misleading, for Jørgen Meldgaard again has informed me verbally that very similar harpoon heads are found in the pre-Dorset deposits at the Iglulik Site. It is possible that the development leading to the type here called Naulock may have been widespread over much of Arctic America rather than having been confined to the Western Arctic as has been previously believed.

The frequency of occurrence of Naulock decreases from 31 per cent at Kugusugaruk to about 19 per cent at Birnirk. Meanwhile, this type became even more simplified and evolved into the class called Tasik. In conformity with the trends that affected all harpoon heads at this time in the Western Arctic, the spurs become single and pointed. The simple decorative lines of Naulock are eliminated. The only portion of the graceful outline of the earlier head retained is a constriction of the width of the Tasik head just above the line hole. Occasionally there is an ornamental depression above the line hole. These heads are oval in cross-section.

A slightly later open socket form has been named Sicco. This is basically similar to Tasik in having a spur with only one point. These heads are not smoothly rounded into an oval cross-section; instead, they have flat facets and rather sharp angles along the edges of the prongs that hold the blade. Some heads also have simple, straight, decorative lines similar to those on Naulock. The Sicco Type does not appear to be directly in the line of forms that were evolving on the north coast of Alaska. It shows more resemblance to the contemporary type of the Bering Strait Region which Collins has described as III(a)x and probably is the result of influence from there. It should be noted that there is less than 1 per cent of Sicco at Birnirk; the greatest frequency, 9 per cent, is at Nunagiak.

In a section above, I describe the finding of typical Punuk Culture artifacts in structures beneath Mound C at Nunagiak. The ivory harpoon heads with Punuk decoration from this locality are not included in the present study, as they are obviously imported and are not part of the local development. However, they introduce the possibility that heads of the Sicco Type owe their similarity to the dominant Punuk Type III(a)x to the fact that they are local copies of the introduced models.

The two historic forms of harpoon heads in the Point Barrow Area are closed socket versions of this tradition of the slot in the plane of the line hole. They are discussed below with other closed socket forms.

In the Canadian Arctic, Thule Type 3 carries the trend towards simplicity and less competent workmanship still further. These open socket heads are usually oval in cross-section; a few have facets. The spurs are short; both lashing slots and drilled holes are used. In some heads the blade is fastened by pegs, a very recent device in the West. For decoration some heads have a simple Y figure inverted above the line hole. Frequencies of Type 3 decrease from 28 per cent at Naujan to about 19 per cent at the two later sites. This is considerably more than the 8 per cent maximum frequency of Tasik in the Point Barrow Region.

Harpoon Heads with Blade Slit at Right Angles to the Line Hole

Figure 116

Murdoch has already been quoted to the effect that the whaling harpoon head with

closed socket and blade slit at right angles to the line hole is likely to be an old form that had changed very little.[1] Archeological work has demonstrated that Murdoch was correct, although the typological arguments on which he based the conclusion are faulty. However, whaling harpoons are not included in the present study; this series consists of the sealing harpoon heads made on the same principle as the larger heads.

The earliest form found in the Okvik Period deposits of St. Lawrence Island has not been found in Ipiutak. Rainey's Type C, with a frequency of 11 per cent, has a trifurcated spur, with one slot and one groove for the lashing. All the 18 specimens found at Okvik bear the straight-line incised designs characteristic of the period.

In the series of sites at Gambell on St. Lawrence Island this form occurs in two types that extended with decreasing popularity through the time represented by the deposits at the Hillside Site and Miyowagh. Type IIIy has bifurcated or irregular spurs and bears either Old Bering Sea or Early Punuk decoration, or is plain. Its frequency declines from about 12 per cent at the Hillside Site to 5 per cent on the northern and western side of Miyowagh. Type III(a)y[2] has a simplified outline. The spur has a single point, and most of the decorated heads bear Punuk style engraving. Obviously, this form developed from Type IIIy. Its frequency runs about 6 per cent at the Hillside Site and about 8 per cent in both the older and later deposits of Miyowagh.

Open socket harpoon heads with blade slits at right angles to the line hole are not found in the Point Barrow sequence or in the Canadian Arctic. However, as is shown below, closed socket heads with these characteristics do continue through the chronologies of these regions. For comparative purposes, several of the late closed socket forms have been placed in Fig. 116. These are St. Lawrence, Type III(b)y, Point Barrow, Type Cape Smythe, and two types from the Canadian Arctic. These closed socket harpoons are repeated in Fig. 117, and their relationships are discussed in conjunction with other closed socket forms.

[1] Murdoch, 1892, 239.
[2] Collins, 1937, 120–122.

Closed Socket Harpoon Heads

Figure 117

Murdoch, in his discussion of the evolution of the forms of harpoon heads, concluded that the old open socket heads were replaced by closed socket forms, the most recent of which is still in use.[3] This excellent argument has not been substantiated by later investigation; closed socket heads are found in the earliest known Eskimo sites.

When a category based on the closed socket is set up, the opportunity is presented to repeat all the variations of orientation of line hole and blade slit that have been mentioned for the open socket forms. The ancient Eskimo took advantage of most of these opportunities as will be seen (Fig. 117). For simplification, the heads that have blade slit or barbs in the same plane as the line hole are discussed first; heads with blades at right angles follow.

Type B from the Okvik Site[4] is the earliest form of closed socket head with the blade slit in the same plane as the line hole. Nearly all the heads are decorated with typical Okvik straight-line engraving; typical symmetrical trifurcated spurs are usual. This type occurs in the Okvik deposits with a frequency of about 17 per cent. There is no directly comparable type in the collection from the Ipiutak Site at Point Hope. Instead, a form that Larsen and Rainey call Type 3 is found. This has side blades in the plane of the line hole and customarily a bifurcated spur. Simple straight-line decoration is usual.[5] As the authors state, this is a closed socket form of the popular Ipiutak Type 1.

The single closed socket head belonging to this group that Collins found at the Hillside Site is badly eroded, so that decoration, if it had any, has been obliterated. Its shape, however, with the symmetrical trifurcated spur and the thinness of the head, seems to place it in the same group as Okvik Type B. This is Collins' Type IIx. Collins' Type Ix, a head with two line holes, is also represented in the older section of the Miyowagh Site by one specimen. Most popular of this closed socket

[3] Murdoch, 1892, 220.
[4] Rainey, 1941, 480–481.
[5] Larsen and Rainey, 1948, 72, Pl. 5, Figs. 1–10, Pl. 37, Figs. 7–8.

group is Collins' Type Vx.[1] This has a single pointed spur, a round beveled line hole, and a blade slit in the plane of the line hole. Early in the time span of this form these heads have Old Bering Sea decoration; when the later heads are decorated the style is Early Punuk. Popularity at the Hillside Site was 12 per cent (only two specimens); the maximum frequency of 16 per cent is in the north and western part of the Miyowagh Midden. This shape reduces to 4 per cent in frequency at Ievoghiyoq and then disappears.

Small ornamental barbs that may have been functional are the features that differentiate Type V(a)x from Type Vx. However, as only two specimens are listed in Table 2, this is not an important variation.

Type V(b)x is a long, tapering harpoon head, with a slender pointed spur. These heads are round or oval in section, with a constriction between the line hole and the tip.[2] This type has a frequency of 3 per cent at Ievoghiyoq and 4 per cent at Seklowaghyaget.

The protohistoric harpoon head with the semi-closed, wedge-shaped socket may be considered the succeeding form in this series, Collins' Type III(b)x.[3] As Collins points out, this curious type of socket is technically open but functions as a closed socket; no auxiliary lashings are necessary. Frequencies of this form are shown in Figs. 115 and 117. The harpoons in current use on St. Lawrence Island all have closed sockets and blade slits in the plane of the line hole.

In the Point Barrow Area the strange harpoon heads flattened on one side (Kilimatavik and Kuk) have no inserted blades, but the barbs are in the plane of the line hole, so technically perhaps they belong to this group of heads. However, it is obvious that they are adaptations of the Thule 2 variety of harpoon head. The same is true of the closed socket barbed form named Brower.

In a more direct line of evolution of the St. Lawrence types just discussed are the two harpoon heads Barrow and Nuwuk, which are in use today or, rather, were in use in 1881–1883 when Murdoch collected. As there are no preceding forms of this group in the Point Barrow Area, or to the east, it seems probable that both these types are late arrivals on the north coast of Alaska and came from the Bering Strait Region.

In the second major group of closed socket harpoon heads the blade slit is at right angles to the line hole. For the data considered here this evolution begins with Okvik Type D[4] (9%) and Ipiutak Type 2[5] (29%). Both have multipointed spurs, usually trifurcated; the characteristic straight-line decoration is found on both types. Okvik heads are usually made of ivory; antler was the preferred material at Point Hope.

Collins' Type IVy is represented by only two harpoon heads; one from the Hillside Site and one from the older section of Miyowagh.[6] These harpoons have single-pointed straight spurs, are perfectly round in section, and while they bear fine line designs their surfaces are smooth. There is no adaptation of contour to design as in the later Old Bering Sea harpoon heads. Peculiarly enough, the designs are applied obliquely around the heads.

Type Vy occurred at a frequency of 16 per cent in the older deposits at Miyowagh and of 11 per cent in the later sites. These heads have very graceful shapes, with rounded rises just above the line hole, and are decorated in Old Bering Sea and Early Punuk styles.[7] Very small percentages of this shape continue at the succeeding sites in the St. Lawrence sequence, and these either bear Punuk decoration or are plain.[8]

The Late Punuk Type V(a)y was found in small frequencies at Ievoghiyoq and Seklowaghyaget. It has a flaring, single-pointed spur and a beveled line hole. Spurred line decoration, one of the Late Punuk styles, is found on four of the five heads of this class.[9]

As Collins has stated, his Type VI, which has a frequency of less than 1 per cent at Ievoghiyoq (one specimen), is a closed socket adaptation of the Thule 2 form. This form is more common in the Point Barrow Area where the

[1] Collins, 1937, 110–111, Pl. 23, Fig. 13, Pl. 26, Figs. 13–15.
[2] Collins, 1937, 206–207.
[3] Collins, 1937, 212–215.
[4] Rainey, 1941, 484–485, Fig. 8.
[5] Larsen and Rainey, 1948, 70–71.
[6] Collins, 1937, 109–110.
[7] Collins, 1937, 111–112.
[8] Collins, 1937, 207.
[9] Collins, 1937, 207, Pl. 70, Figs. 22–23.

Nunagiak Type attains a frequency of 18 per cent at Nunagiak and of 14 per cent at Utkiavik.

Alilu is the only early type that conforms to this class in the Point Barrow Area. This is made of antler; instead of incising, the heads bear simple decoration formed by raised lines. Two specimens came from the Birnirk Site. In the foregoing type description additional occurrences on the Kobuk River and on Victoria Island are cited.

A late member of this class in the Point Barrow Area is the type named Cape Smythe. This has a simple spur, sometimes bifurcated, a beveled line hole, and prongs cut and grooved to receive a chipped stone point. The frequency of 13 per cent for Cape Smythe exceeds the 4 per cent (one specimen) occurrence of the directly comparable type from the Kuk Site in the Canadian Arctic.[1]

The Thule Culture of Canada had two sources from which closed socket harpoon heads might have developed, and both were utilized. One, the Western Arctic sequence just traced, was apparently the source from which most of the harpoons which Mathiassen lists as Thule Type 4 were derived.[2] In contrast to the single head from Kuk, mentioned above, these heads are made for thin slate blades. They have rather straight spurs which in some specimens are bifurcated at the point. With a popularity of 11 per cent at Naujan this type has an occurrence of only 4 per cent at the later Mitimatalik. Thule Type 4 is obviously related to Okvik Type D, Ipiutak Type 2, and the later "y" series of the St. Lawrence sequence. However, the corresponding form does not appear in the Point Barrow sequence except in the form of the rare Alilu Type.

[1] Mathiassen, 1927a, Pl. 69, Fig. 4. Mathiassen includes this specimen in his Thule Type 4 category.

[2] Mathiassen, 1927b, 21–22. Cape Dorset Culture was, of course, the other source.

TRAIT COMPARISON

In the comparative sections that follow the description of each variety of artifact, attention is directed to related forms in the established chronologies to the westward and eastward of Point Barrow. I propose to summarize these comparisons here.

The process of listing cultural traits which at first consideration may seem to be very simple is, in reality, quite a difficult task. Two decisions must be made for each trait. First, should the unit of comparison be the artifact, features of artifacts, or categories of artifacts? Trait lists may be extended considerably by making finer distinctions, but the significance of similar clusters of features is lost in the process. The second decision is that of the degree of similarity that is to be considered significant. That two groups of people used the adze has a different level of significance from the statement that the adzes are virtually identical. The wording of trait descriptions can actually be misleading.

In selecting the traits used here, I have tried to be as specific as possible without too much fractioning of the categories. Also, items have been listed only for the time level of their first appearance in a geographical area. For example, many of the 32 traits shared by the Okvik Period of St. Lawrence and Birnirk are also found in the Old Bering Sea Period that succeeds Okvik. However, the 27 traits listed as shared by Old Bering Sea and Birnirk do not duplicate the features already cited for the earlier period; the latter first appear on St. Lawrence Island in Old Bering Sea times. The traits discussed here do not include the mass of the cultural equipment that was inherited for succeeding periods in the same geographical area. Rather we consider traits that appear to have diffused across geographical space and thus became elements in new cultural combinations.

DERIVATION OF THE BIRNIRK CULTURE

The relationships to be discussed are summarized in Fig. 118. In this diagram the names of cultural periods are arranged vertically in what is believed to be approximate chronological relationship. These names are connected by shaded bands that vary in width according

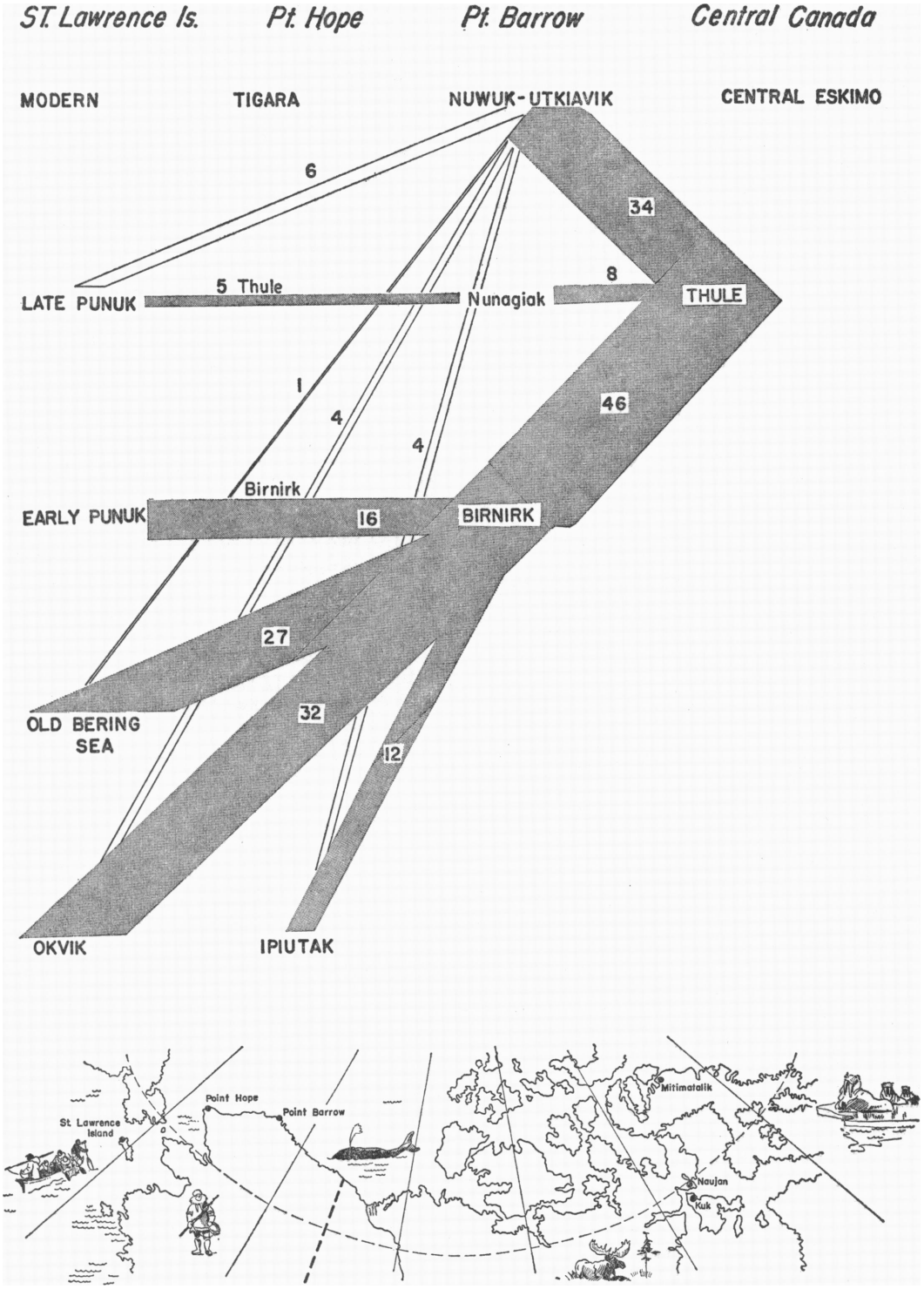


FIG. 118. Diagram showing the number of specific traits that link Birnirk with earlier cultural stages in the Western Arctic, the Thule Culture of Central Canada, and the Nuwuk-Utkiavik occupation of the Point Barrow Area.

to the number of shared traits. It is immediately apparent that Birnirk has more traits in common with the Okvik and Old Bering Sea periods of St. Lawrence Island and Siberia than with the geographically closer Ipiutak Culture of Point Hope. The 32 traits shared with Okvik are listed below:

Tapering tang arrowheads with free standing barbs
Tapering tang arrowheads with stone points
Leaf-shaped chipped points, Class 5
Long barbed bird dart point
Umiak
Kayak
Snow goggles, one-piece
Multipointed fish spear
Composite knife handle
Man's knife handle, antler, round in section, blade in end
Double-edged slate knife blade, short
Chipped double-edged knife blade
Firedrill
Adze blade, beveled edge
Adze blade, sharp edge
Picks and mattocks with deep lashing grooves
Whetstone, square in cross-section
Flint flaker, bent handle, and wedge-shaped point
Bone wedges
Pottery
Pottery paddles
Oval-shaped ulu handles
Endscraper blade, triangular in shape
Cup-shaped fat scraper
Chipped sidescraper
Baleen bucket with flat bottom
Dolls, female, often pregnant
Toys, usually models of tools
Tambourine drum
Ornamental toggles
Belt hooks
Baleen toboggan

The following traits have not been found in Okvik, but very similar forms are shared by Birnirk and the Old Bering Sea periods:

Whale harpoon head
Slate harpoon blade with narrow edge facets
Ice pick, Birnirk Type A
Inflation plug for seal poke
Lance point, detachable
Atlatl hand grip and hook
Dart butt piece, Type B
Winged objects, Old Bering Sea type
Bird dart side prong, Class A
Bird dart side prong, Class B
Bone and ivory runners for hand sled
Two-piece ice scoop
Ice scoop, baleen rim
Wound plugs
Knife handle, circular in cross-section, side blade
Bowdrill with bone point
Scapula snow shovel
Stemmed chipped blades
Saucer-shaped pottery lamp with paddle decoration
Flaked, double-edged sidescraper
Spoon with handle attached below rim
Needle case, knobbed
Seal-gut rain parka
Ajagaq
Siamese-twin whale effigy
Buttons
Rectangular, semi-subterranean houses with walls formed by horizontal logs

The following traits are shared by Birnirk and Ipiutak as they have been described at Point Hope. It will be noted that in several instances the same trait has also been listed for the two earliest periods of the St. Lawrence Island chronology. This appears to be fair, as the Birnirk phase could have derived the trait from the early phases of either area.

Oopik harpoon heads
Bird dart side prong, Class A
Man's knife handle, circular in cross-section, side blade
Whetstone, square in cross-section
Flint flaker with bent handle and wedge-shaped point
Bone wedges
Engraving tool, iron point
Endscraper blade, triangular
Beamer, deer metapodial
Flaked, chipped, double-edged sidescraper
Iron pyrites
Inserted bird-wing bones

Birnirk shares the following traits with the early phase of the St. Lawrence Island Punuk Period:

Tuquok harpoon head
Oopik harpoon head
Naulock harpoon head
Foreshaft, Birnirk type
Float bars with tapering ends
Harpoon finger-rest with constricted sides
Composite sinew-backed bow with braces
Sinew wrench and marlinspike
Atlatl, Birnirk type
Bolas ball, large, crude
Baleen ring for walking staff
Knife blades, iron

Engraving tool, iron point
Meat fork
Bear canines, perforated, with decorative grooves
Inserted bird-wing bones

The foregoing comparisons seem to make it clear that the culture of the inhabitants of the Birnirk Site was derived from the same roots as the Okvik and Old Bering Sea Period manifestations of the Bering Strait Area if not directly from those cultural phases. A much more impressive list of traits, a total of 46, links the Birnirk cultural phase with the Thule Culture of Central Canada. It is certainly significant that nearly all these traits are found at the earliest of Mathiassen's sites, Naujan. Linking traits for Birnirk and Thule are:

Natchuk harpoon head
Tipiruk harpoon head
Harpoon shaft splice reënforcement
Whale harpoon head
Foreshaft, Birnirk type
Flaked whale lance head
Harpoon finger-rest with constricted sides
Composite sinew-backed bow with bracers
Bow sinew wrench and marlinspikes
Dart butt piece, Type B
Flat, *komotin* type sled
Umiak
Umiak bottom crosspiece of similar shape
Kayak
Similar perforated antler strips, possibly kayak ribs
Snow goggles, one-piece
Bolas ball, large, crude
Composite knife handle
Knife handle, round in section, blade in end
Slate knife blade, double-edged, short
Bowdrill with bone point
Firedrill
Caribou astragalus bearing for drill
Stone point for bowdrill
Wood snow shovel, simple bone edge
Adze blade with beveled edge
Adze blade with sharp edge
Flint flaker, bent handle, and wedge-shaped point
Bone wedges
Pottery
Endscraper blade, triangular
Cup-shaped fat scraper
Baleen bucket with flat bottom
Curved endscraper handle
Meat fork
Wound pin
Needle case, knobbed
Dolls
Ajagaq
Bull-roarer
Ornamental toggles
Drop pendants, ivory
Baleen toboggan
Bear canines, perforated, decorative grooves
Iron pyrites
Decoration of parallel lines with alternating spurs

The traits listed above and the summary diagram (Fig. 118) should not be interpreted as indicating that the Canadian Thule derived directly from the cultural stage represented at the Birnirk Site. It seems more probable that the Eskimo who migrated eastward, bearing the Thule Culture, were contemporaries of the early occupants of the Nunagiak Site.

Only eight traits that first appear at Nunagiak are shared by the Thule Culture:

Thule 2 harpoon head
Tasik harpoon head
Arrowhead with knobbed tangs
Harpoon socket piece with wedge-shaped tang
Bird dart side prong, late type
Bladder dart socket pieces with tubular and split tangs
Double-crescent thimble holder
Gull hook

Some of these same features also provide evidence of connection with the late phase of the Punuk Period on St. Lawrence. These are:

Thule 2 harpoon head
Tasik harpoon head
Sicco harpoon head
Harpoon socket piece with wedge-shaped tang
Double-crescent thimble holder

Mathiassen was particularly impressed by the resemblances between traits of the Thule Culture and the historic culture of Alaska, particularly Point Barrow.[1] Collins has discussed this relationship at length, concluding that the resemblances are in part attributable to a recent westward movement of Eskimo.[2] His conclusions are supported by 34 traits that appear first in Canadian Thule and are also found in the Nuwuk and Utkiavik sites. These traits, in the forms described, are peculiar to these proveniences and are represented in earlier sites:

Utkiavik harpoon head

[1] Mathiassen, 1927b, 182–184.
[2] Collins, 1937, 364–372.

Cape Smythe harpoon head
Nunagiak harpoon head
Kilimatavik harpoon head
Fine-grained reddish slate
Arrowheads with spurred, shouldered tangs
Slate harpoon blade with wide facets
Inflation nozzle for bladder dart
Float bar with knobbed end
Ice pick, Type C
Bone arrowheads of late types
Bone sled shoes
Bodkin for stringing fish and birds
Harness trace buckle with holes parallel
Fish effigy, salmon decoy
Baleen wolf killers
Knife for squeezing out water
Salmon spear
Single-edged slate knife blade
Double-edged slate knife blade, long
Snow knife
Snow probe
Man's knife handle, flattened, oval in cross-section, slot in end
Picks and mattocks with lashing notches (not grooves)
Crooked knife
Half-moon soapstone lamp
Slate ulu with segment-shaped handle, back thickened
Cylindrical ulu handle
D-shaped ulu handle
Blubber pounder
Meat fork
Boots with two pairs of loops for laces
Ownership marks
Y ornament

At the same time there seems to have been a continuing influence from the Bering Strait Region into the Point Barrow Area. The late phase of the Punuk Period on St. Lawrence Island and Nuwuk-Utkiavik share the following traits:

Utkiavik harpoon head
Bladder dart mouthpiece
Heavy netsinker
Seal scratcher
Slat armor
Wrist guard

In addition there are also some anomalous trait distributions. The following items are found in the Okvik Period deposits of St. Lawrence, but first appear in the Point Barrow Area at the Utkiavik time level:

Harpoon head resembling Cape Smythe Type
Bird arrowpoint, blunt
Three-piece adze with handle lashed to socket at right angles
Blubber hook

The following traits are shared by Ipiutak and Utkiavik:

Harpoon head resembling Cape Smythe Type
Arrowshaft wrench
Three-piece adze with handle lashed to socket at right angles
Labrets

A single trait, tops, first found in the Old Bering Sea Culture on St. Lawrence Island, was made all through the St. Lawrence chronology, but the earliest occurrence in the Point Barrow Area is at Utkiavik.

RELATIVE AND CALENDRICAL DATING OF THE POINT BARROW SEQUENCE

I cite above my reasons for agreeing with the conclusions of previous writers that the Birnirk cultural phase was derived from the Okvik and Old Bering Sea cultures of the Bering Strait Region which, in turn, gave rise to the Thule Culture which spread eastward to Central Canada. The theory of a late westward spread of typical Thule Culture elements is also supported.

Throughout this discussion it is taken for granted that the Birnirk Culture was coeval with the very end of the Old Bering Sea Phase and the early part of the Punuk Period. This conclusion was first suggested by the time position of some of the typical Birnirk harpoon heads found in deposits excavated on St. Lawrence Island. The antler harpoon heads of the Birnirk types contrast markedly with the ivory specimens that are usual in these deposits. This relative dating seems to be supported by the resemblances in other artifacts that are mentioned above.

The time position of the Western Thule Phase was also clearly indicated by the St. Lawrence Island excavations. Apparently the Thule Culture was developing on the Arctic

Coast of Alaska at the same time that a late phase of the Punuk Period prevailed in the Bering Strait Area.

At Point Hope, Larsen and Rainey found substantially the same sequence of materials as is detailed for the Point Barrow Area. The smaller collections that they had for study may have left the question of continuity of development and of occupation unanswered, but from the study of the Point Barrow collections it seems obvious that there was no substantial break in occupation from Birnirk to historic times.

The cultural correlation of the Point Barrow sequence to the series of sites reported by Giddings on the Kobuk River is also clear. This work, based on limited collections, makes quantitative comparisons impossible, and the significance of traits that are absent is uncertain. There are, however, two important and very useful aspects to Giddings' study. First, he has been able to establish finer divisions in the sequence from the time of the Western Thule cultural phase to the modern phase than have been possible with the material given in the present report. Second, he has provided dendrochronological dates for the Kobuk River sites. By comparison, Giddings' dated chronology may be applied to the latter part of the Point Barrow sequence.

Detailed comparisons of the artifacts are scattered through the foregoing pages. The apparently significant shared traits are briefly summarized.

The Ahteut Site and Birnirk share the following features:

Antler arrowheads with tapering tangs
Birnirk type of ice pick for harpoon
Engraving tools
Chipped flint knife blades with wide rounded stems
Ground slate, double-edged, long knife blades
Deer metapodial beamer
Whale-rib picks with deep lashing grooves
Pottery with semicircular pattern stamped decoration

The three harpoon heads from Ahteut are made of ivory: one is Collins' Type III(a)x, with Middle Punuk style of decoration; one, of the same shape but undecorated (fairly common in Middle and Late Punuk); and one, of Thule Type 2.

This scant evidence suggests that the Ahteut Site, with a tree-ring date of 1250 A.D., is coeval with the end of the occupation of the Birnirk Site and the beginning of the occupation of the Nunagiak Site in the Point Barrow Area and also with the Ievoghiyoq Site on St. Lawrence Island.

The harpoon heads and arrowpoints from Giddings' next oldest sites, Old Kotzebue and Ekseavik, dated about 1400 A.D., compare most closely with those from Nunagiak. Two harpoon heads from Ekseavik are of Thule Type 2, and two open socket heads conform to the type here called Tasik, which, as Giddings notes, is identical with Mathiassen's Type 3. Two closed socket heads with raised decoration are identical with the type I call Alilu, which seems to be a rare form associated with Thule types in the Western Arctic.

The antler arrowpoints from these two Kobuk River sites are comparable to the varieties which are here called barbed with knobbed tang. These occur at the Birnirk Site but are most characteristic of Nunagiak.

Some additional artifacts from Old Kotzebue and Ekseavik are comparable to those from Birnirk and Nunagiak. These are: a pottery paddle with concentric circle decoration and potsherds with paddled designs, deer metapodial beamers, harpoon ice picks, composite knife handles resembling the Birnirk Type, and bird dart side prongs of triangular section with barbs on each angle. On the other hand, a number of items in the Point Barrow Area are found only at the late sites, Nuwuk and Utkiavik. These are blunt bone heads for bird arrows, adze handles fastened at right angles to socket pieces, adze socket pieces with drilled lashing holes, salmon spear parts, bladder dart nozzles, anchor-shaped thimble holders, and hair combs.

Giddings' collection from the more recent site of Intermediate Kotzebue, dating about 1550 A.D., makes it clear that the Nuwuk and Utkiavik sites, which because of the nature of my collection have had to be treated as representing a single time period, actually were occupied for several centuries. The Intermediate Kotzebue Site added to the Kobuk sequence the following items also found at the late site of the Point Barrow Area: net shuttles and mesh gauges, pegged-on sled shoes, barbed arrowheads made with a socket for a stone point (Giddings' Type 3), long, narrow, thick, chipped-stone points, wrist guards for archers,

composite knife handles of Utkiavik type, crooked knives, men's knife handles flattened oval in section, slat armor, and hat-shaped and pin-shaped labrets. The harpoon heads from Intermediate Kotzebue all have closed sockets and are comparable to the types here called Kilimatavik, Barrow, and Cape Smythe.

The latest dated site in the Kobuk River sequence (1730 to 1760 A.D.) introduces several more items that I have here had to lump in the Nuwuk-Utkiavik horizon. These are antler arrowheads with spurred tangs, net floats and weights, the use of jade, and dog-harness swivels. The site is inland, and, as is to be expected, the seal-hunting equipment so useful for comparisons is lacking.

The few radiocarbon dates that have thus far been obtained for Western Eskimo prehistory are not entirely consistent with the archeological evidence. One assay made on wood from the Hillside Site at Gambell gave an elapsed itiom of 2258±230 years, just about the age that archeologists, working on the Eskimo problem, had been guessing for Old Bering Sea 1 or the Okvik phase of culture.[1] However, five dates for the Ipiutak Culture, which should be of approximately the same age, range from about the beginning of the Christian era to about 1000 A.D.[2] The later dates would place Ipiutak only about 200 to 300 years before the beginning of Giddings' tree-ring chronology; in other words, only two to three centuries before the middle of the Punuk Period on St. Lawrence Island and the end of the Birnirk Period at Point Barrow. This hardly seems enough time for the intervening cultural periods to become established. Doubtless this apparent anomaly will soon be cleared up by additional radiocarbon assays.

In conclusion, it may be stated briefly that the Birnirk cultural phase seems to have been derived from the Okvik and Old Bering Sea cultural complexes of the Bering Strait Region. The Thule Culture of Central Canada was, in turn, primarily derived from Birnirk. The final stages of the evolutionary process took place early in the occupation of the Nunagiak Site. The postulated late return migration of Thule people into Alaska is also supported by the evidence presented here.

[1] Libby, 1955, 127, Sample C-505.

[2] Larsen, 1952.

APPENDIX: SKELETAL REMAINS FROM THE VICINITY OF POINT BARROW, ALASKA

T. D. STEWART
Division of Physical Anthropology
United States National Museum

IN 1932 JAMES A. FORD collected for the United States National Museum, among other things, human skeletal material from Eskimo sites in the vicinity of Point Barrow, Alaska.[1] This collection (U.S.N.M. Acc. No. 122649) consists mainly of skulls from the following localities (north to south): Nixeruk, Birnirk (or Piginik), Utkiavik (or Barrow Village), and Kugok (or Utkiavik burial mounds).

Ten years after the Ford Collection arrived in Washington Hrdlička included it in the second edition of his "Catalog of human crania in the United States National Museum collections: Eskimo in general."[2] In this edition the section on "Barrow Eskimo"[3] includes 337 skulls, a phenomenal increase over the eight skulls from this area in the first edition.[4] To a large extent this increase reflects the intensive anthropological field work that was carried on in Alaska during the late 1920's and the 1930's, but also it reflects Hrdlička's disregard for the title of his publication and hence the inclusion of series from the American Museum of Natural History in New York, and the Wistar Institute and the University Museum in Philadelphia.

Owing to the fact that most of the Eskimo skulls available to him were surface gleanings and hence undated, Hrdlička arranged his "Catalog" solely on a geographical basis, disregarding such cultural evidence as was available. Probably he could not have done otherwise at the time, because, of the material from old sites represented, only the so-called "Old Igloo" (or Van Valin) Collection was clearly identified culturally.[5] However, the extent of the confusion created by Hrdlička (the combining of specimens from different cultures or chronological periods and vice versa) was not fully apparent before Ford undertook his study.

When in the spring of 1957, less than a year before his study was completed, Ford invited me to prepare an analysis of his skeletal collection as an appendix to his study, I was already committed to a heavy schedule (including trips abroad lasting nearly five months). Thus, for lack of time I decided against reëxamining any of the skulls studied by Hrdlička, although fully realizing the desirability of making available fuller anthropometric and anthroposcopic data for future comparisons. Instead, and in view of the new cultural orientation provided by Ford's findings, I decided simply to recombine the existing measurements chronologically and to examine statistically the resulting differences between the ancient and modern groups. In defense of this course I hold that Hrdlička's measurements would not be altered significantly on being repeated by me, his erstwhile associate.[6] Also, I have pointed out elsewhere[7] that Hrdlička was able to sex Eskimo skulls with remarkable accuracy.

The collections that Hrdlička measured and that are considered here are those of Ford, Hrdlička, and Ray in the United States National Museum, Washington; Van Valin in the Wistar Institute, Philadelphia (see also p. 246); Hopson in the University Museum, Philadelphia; and Stefánsson in the American Museum of Natural History. As shown in Table 24, these series can now be arranged into two groups: recent (if we assume that burials on the surface do not long survive) and old (those from excavations yielding cultural associations with the Birnirk Period). The geographical relationship of the sites from which these series were obtained is shown in Ford's report (Figs. 1–3, 5–8, 14).

In elaboration of footnote *a* to Table 24, attention is called to the fact that Hrdlička combined three series under the heading "Igloo Mounds": (1) the series collected by Van Valin at Kugusugaruk and both sexes designated by

[1] Collins, 1933.
[2] Hrdlička, 1942.
[3] Hrdlička, 1942, 347–379.
[4] Hrdlička, 1924.
[5] Collins, 1934.
[6] Stewart, 1943.
[7] Stewart, 1954.

TABLE 24

CHRONOLOGICAL DIVISION OF POINT BARROW ESKIMO SKULLS MEASURED BY HRDLIČKA (1942)

Sites in Geographical Order from Northeast to Southwest	Collector	Present Location	Size of Series Male	Size of Series Female
Recent (found on surface, without cultural association)				
Point Barrow	Stefánsson	A.M.N.H.	44	49
Point Barrow	Ray	U.S.N.M.	5	3
Nixeruk	Ford	U.S.N.M.	27	28
Barrow[a]	Van Valin	Wistar Inst.	21	14
Barrow	Hrdlička	U.S.N.M.	16	22
Utkiavik[b]	Ford	U.S.N.M.	13	18
			126	134
Old (burials associated with Birnirk culture)				
Birnirk (Piginik)	Ford	U.S.N.M.	1	4
Kugok[b]	Ford	U.S.N.M.	3	3
Nunavak[a]	Hopson	Univ. Pennsylvania	3	6
Kugusugaruk[a]	Van Valin	Wistar Inst.[c]	28	24
			35	37

[a] Combined by Hrdlička under the name "Igloo Mounds."

[b] Combined by Hrdlička under the name "Old heaps, near Utkiavik." Five others are now regarded as of uncertain age (see Table 26).

[c] For the part of this collection recently transferred to the United States National Museum, see Table 25.

(usually) paired numbers from 1 to 6–8; (2) that collected by Van Valin on the surface at Barrow and the males designated by the letters B-a to u, the females by the numbers B-1 to 14; and (3) that collected by Hopson at Nunavak and both sexes designated by a combination of three figures, 29-80-142 (to 150). There is no explanation for Hrdlička's inclusion of the Van Valin surface collection from Barrow with the Mound series from farther down the coast, because Hrdlička's measurement forms are clearly labeled.

It is noteworthy that the Wistar Institute donated part of the Kugusugaruk series (as the "Old Igloo" series properly should be called) to the United States National Museum in 1956. For the record, the old and new numbering systems are equated as shown in Table 25.

Footnote *b* to Table 24 calls for elaboration which is best given in the form of another table (Table 26). Commenting on the Utkiavik burials here labeled "recent (surface)," Ford says that they were collected mainly

> from the tundra over a wide expanse, about 1 mile east of the village [of Barrow]. Many had been placed in wooden boxes secured with iron nails. For this reason I would judge that this group dates after white contact, but before arrival of missionaries—say between 1880 and 1910. As a group these skulls may be slightly later than those from Nixeruk. There might be a point of interest here: Charley Brower told me several times that the original Barrow population, which comprised the Barrow community when he first went there, about 1890, had almost all died in the course of various epidemics, and that the population of the early 1930's was almost completely inland Eskimo who had come from the interior—from the drainage of the Colville and other rivers to the east. Brower thought these inland people were taller, etc.[1]

This impression of greater stature in the Eskimo who reached Barrow recently from the interior, as compared with those who lived at Barrow prior to 1890, cannot be checked against skeletal remains, because adequate collections are lacking. Ford brought back, in addition to skulls, only nine skeletons (U.S.N.M. Nos. 365892–365896, 365901–365903, 365905), of which one is a child and most of the others are females. Only two belong to the recent period.

The only published longbone measurements for the area are those on the Van Valin Collec-

[1] Ford, personal communication, April 11, 1957.

TABLE 25

PORTION OF VAN VALIN COLLECTION FROM KUGUSUGARUK PRESENTLY IN THE UNITED STATES NATIONAL MUSEUM (FIELD NUMBERS AND CURRENT MUSEUM NUMBERS)

Males		Females	
Field No.[a]	U.S.N.M. No.	Field No.	U.S.N.M. No.
1–3a	381104	1–1	381116[b]
1–8	381128	1–2	381115
1–13	381107	1–2a	381111
1–21	381113[a]	1–6	381093
2–1	381094	1–7	381122
2–2	381112	1–14	381127
2–3	381090	1–16	381121[d]
2–6	381125	2–1a	381095
2–8	381109	3–12	381098[e]
3–5	381102	3–13	381114
4–5	381110	3–15	381103
4–6	381099	4–1	381091
4–7	381117	4–11	381100
4–16	381129	4–26	381130
4–19	381123[f]	5–2	381092
4–25	381118	5–3	381120
6–2	381106		
6–3	381119		
6–7	381101		
6–8	381097		

[a] These field numbers obviously refer to Van Valin's numbered diagrams and burials (see Figs. 2–3).
[b] Plate 12. [c] Plate 9. [d] Plate 13. [e] Plate 11. [f] Plate 10.

TABLE 26

CHRONOLOGICAL DIVISION OF SKULLS FROM THE FORD COLLECTION FROM THE VICINITY OF UTKIAVIK MEASURED BY HRDLIČKA (1942)
(All numbers are those of the United States National Museum.)

Recent (Surface)		Old (Kugok)		Uncertain Age	
Male	Female	Male	Female	Male	Female
365853[a]	365860	365894[b]	365887[b]	365885	365725
365854	365861	365896[b]	365889[c]	365911A	365884
365855	365862	365897[c]	365895[c]		365886
365856	365863				
365857	365865				
365858	365866				
365859	365868				
365864	365869				
365867	365870				
365871	365872				
365877	365873				
365879	365874				
365891[d]	365875				
	365876				
	365880				
	365881				
	365892[e]				
	365893[e]				

[a] Hrdlička repeats this number among the females; it is a mistake for U.S.N.M. No. 365865.
[b] From Burial Mound B.
[c] From Burial Mound A.
[d] Hrdlička gives a second male with this number; it is a mistake for U.S.N.M. No. 365871.
[e] From House B. Said to have starved to death "before Charley Brower came," i.e., before 1890.

TABLE 27

STATISTICAL COMPARISONS OF CRANIAL MEASUREMENTS: MALE

Group	No.	Range	Mean ± S.E.	σ ± S.E.	t
Maximum length					
Point Barrow	49	174–199	187.06±0.66	4.61±0.46	
Nixeruk	26	180–194	186.38±0.71	3.63±0.50	2.12
Barrow-Utkiavik	50	177–201	188.52±0.71	5.04±0.50	
All recent	125	174–201	188.50±0.42	4.69±0.30	3.69
Birnirk	35	180–208	193.05±1.00	5.95±0.71	
Maximum breadth					
Point Barrow	49	129–146	139.04±0.53	3.69±0.37	
Nixeruk	26	134–146	140.62±0.57	2.92±0.40	2.96
Barrow-Utkiavik	50	129–148	138.36±0.50	3.57±0.36	
All recent	125	129–148	139.10±0.34	3.65±0.24	8.12
Birnirk	34	126–140	133.18±0.65	3.80±0.46	
Cranial index					
Point Barrow	49	68.8–79.9	73.89±0.34	2.38±0.24	
Nixeruk	26	70.8–79.4	74.88±0.42	2.15±0.30	3.59
Barrow-Utkiavik	50	68.6–78.3	72.92±0.35	2.46±0.25	
All recent	125	68.6–79.9	73.71±0.34	2.38±0.24	8.67
Birnirk	34	62.0–75.0	69.06±0.49	2.87±0.35	
Basion–bregma height					
Point Barrow	47	130–144	137.49±0.53	3.61±0.37	1.58
Nixeruk	26	130–146	136.04±0.75	3.82±0.53	
Barrow-Utkiavik	42	128–146	137.33±0.61	3.98±0.43	
All recent	115	128–146	137.11±0.36	3.84±0.25	5.62
Birnirk	34	134–147	141.00±0.59	3.45±0.42	
Mean height index					
Point Barrow	47	80.4–90.2	84.78±0.36	2.44±0.25	2.08
Nixeruk	26	79.3–90.9	83.62±0.43	2.18±0.34	
Barrow-Utkiavik	42	79.1–92.7	84.45±0.35	2.26±0.25	
All recent	115	79.1–92.7	84.40±0.22	2.36±0.16	4.05
Birnirk	34	80.0–92.2	86.44±0.45	2.64±0.32	
Cranial module					
Point Barrow	47	146.7–160.0	154.58±0.42	2.86±0.29	
Nixeruk	26	150.0–158.7	154.42±0.50	2.53±0.35	
Barrow-Utkiavik	42	145.7–161.3	154.78±0.50	3.28±0.36	
All recent	115	145.7–161.3	154.62±0.28	2.96±0.19	1.25
Birnirk	34	150.0–160.7	155.32±0.49	2.84±0.34	
Alveolar point–nasion					
Point Barrow	37	71–88	78.35±0.70	4.28±0.50	
Nixeruk	16	72–82	77.12±0.75	2.98±0.53	1.72
Barrow-Utkiavik	25	72–88	78.76±0.64	2.98±0.53	
All recent	78	71–88	78.36±0.42	3.76±0.30	2.28
Birnirk	31	73–84	76.84±0.51	2.86±0.36	

TABLE 27—(*Continued*)

Group	No.	Range	Mean±*S.E.*	σ±*S.E.*	*t*
Diameter bizygomatic maximum					
Point Barrow	44	135–149	142.00±0.54	3.55±0.38	
Nixeruk	25	133–148	140.88±0.80	4.00±0.57	2.83
Barrow-Utkiavik	33	134–152	143.85±0.68	3.90±0.48	
All recent	102	133–152	142.00±0.38	3.85±0.27	1.35
Birnirk	33	132–151	141.24±0.74	4.28±0.53	
Facial index, upper					
Point Barrow	36	48.6–62.6	55.11±0.42	2.55±0.30	
Nixeruk	16	50.0–58.8	54.9		
Barrow-Utkiavik	24	49.0–59.4	55.04±0.46	2.26±0.33	
All recent	76	48.6–62.6	55.09±0.28	2.48±0.20	0.77
Birnirk	31	51.0–58.3	54.72±0.38	2.14±0.27	
Endobasion–nasion					
Point Barrow	47	98–114	106.11±0.49	3.35±0.35	
Nixeruk	26	100–111	106.85±0.54	2.77±0.38	
Barrow-Utkiavik	42	98–114	106.52±0.50	3.27±0.36	
All recent	115	98–114	106.43±0.30	3.22±0.21	1.92
Birnirk	34	100–116	107.82±0.64	3.75±0.45	
Endobasion–subnasal point					
Point Barrow	45	85–101	92.09±0.52	3.50±0.37	2.28
Nixeruk	21	90–100	94.02±0.66	3.05±0.47	
Barrow-Utkiavik	33	83–102	93.12±0.70	4.05±0.50	
All recent	99	83–102	92.80±0.37	3.67±0.26	1.75
Birnirk	34	86–102	94.15±0.68	3.96±0.48	
Endobasion–prealveolar point					
Point Barrow	36	96–116	104.50±0.70	4.21±0.50	
Nixeruk	16	99–113	105.75		
Barrow-Utkiavik	25	97–113	104.44±0.76	3.82±0.54	
All recent	77	96–116	104.74±0.45	3.94±0.32	1.30
Birnirk	26	95–114	106.08±0.90	4.58±0.64	
Facial angle					
Point Barrow	36	62.0–73.0	68.94±0.45	2.68±0.32	2.05
Nixeruk	16	65.5–72.5	69.46		
Barrow-Utkiavik	20	66.0–75.0	70.35±0.52	2.34±0.37	
All recent	72	62.0–75.0	69.67±0.30	2.51±0.21	
Birnirk	26	65.5–74.0	70.42±0.41	2.07±0.29	
Alveolar angle					
Point Barrow	36	50.0–64.0	55.94±0.55	3.30±0.39	1.74
Nixeruk	16	46.0–65.5	55.56		
Barrow-Utkiavik	24	50.5–68.0	57.79±0.91	4.45±0.64	
All recent	76	46.0–68.0	56.68±0.47	4.12±0.33	
Birnirk	26	44.0–63.5	56.35±0.85	4.33±0.60	

TABLE 27—(*Continued*)

Group	No.	Range	Mean ± *S.E.*	$\sigma \pm S.E.$	*t*
Orbital height, right					
Point Barrow	43	30.0–40.0	36.31±0.31	2.06±0.22	
Nixeruk	21	33.0–42.0	36.88±0.44	2.02±0.31	1.26[a]
Barrow-Utkiavik	33	33.0–39.5	36.80±0.23	1.31±0.16	
All recent	97	30.0–42.0	36.40±0.19	1.85±0.13	
Birnirk	32	32.5–41.0	36.06±0.39	2.20±0.28	
Orbital breadth, right					
Point Barrow	43	37.0–43.0	40.50±0.23	1.50±0.16	
Nixeruk	21	37.5–43.0	41.36±0.34	1.56±0.24	2.10
Barrow-Utkiavik	33	38.0–45.0	40.89±0.24	1.36±0.17	
All recent	97	37.0–45.0	40.82±0.15	1.50±0.11	
Birnirk	32	36.0–42.0	40.18±0.27	1.54±0.19	
Orbital index, right					
Point Barrow	43	70.6–97.4	89.70±0.81	5.30±0.57	
Nixeruk	21	82.6–97.7	89.19±0.88	4.05±0.62	0.67[a]
Barrow-Utkiavik	33	77.8–97.4	88.88±0.73	4.20±0.52	
All recent	97	70.6–97.7	89.31±0.48	4.72±0.34	
Birnirk	32	78.6–98.8	90.06±0.80	4.55±0.57	
Nasal height					
Point Barrow	46	50.0–61.0	55.11±0.36	2.48±0.26	
Nixeruk	22	51.5–58.0	55.18±0.40	1.90±0.29	
Barrow-Utkiavik	35	49.0–61.0	55.42±0.47	2.79±0.33	
All recent	103	49.0–61.0	55.23±0.24	2.48±0.17	1.35
Birnirk	34	49.0–61.0	54.56±0.43	2.52±0.30	
Nasal breadth					
Point Barrow	46	19.5–26.0	23.42±0.23	1.56±0.16	
Nixeruk	22	20.5–27.0	24.05±0.33	1.56±0.23	2.67[a]
Barrow-Utkiavik	35	21.5–27.0	24.36±0.27	1.58±0.19	
All recent	103	19.5–27.0	23.96±0.16	1.64±0.11	
Birnirk	34	19.5–28.0	23.94±0.39	1.71±0.21	
Nasal index					
Point Barrow	46	35.5–49.1	42.39±0.48	3.25±0.34	
Nixeruk	22	37.3–49.1	43.95±0.57	2.68±0.40	2.09
Barrow-Utkiavik	35	39.1–52.0	43.60±0.49	2.92±0.35	
All recent	103	35.5–52.0	43.14±0.30	3.10±0.22	
Birnirk	34	35.4–50.9	43.85±0.59	3.44±0.42	
Upper alveolar arch, maximum length					
Point Barrow	33	52–63	56.27±0.44	2.52±0.31	
Nixeruk	11	52–60	55.82		
Barrow-Utkiavik	18	53–61	55.78		
All recent	62	52–63	55.95±0.30	2.39±0.21	
Birnirk	29	50–63	56.07±0.48	2.57±0.34	

TABLE 27—(*Continued*)

Group	No.	Range	Mean ± *S.E.*	$\sigma \pm S.E.$	*t*
Upper alveolar arch, maximum breadth					
Point Barrow	33	58–71	64.73±0.50	2.90±0.36	
Nixeruk	11	59–69	64.18		
Barrow-Utkiavik	18	58–71	64.61		
All recent	62	58–71	64.60±0.37	2.94±0.26	3.74
Birnirk	29	62–76	67.17±0.58	3.11±0.41	
Upper alveolar arch, index					
Point Barrow	33	78.8–98.4	87.08±0.76	4.37±0.54	
Nixeruk	11	81.2–94.9	87.05		
Barrow-Utkiavik	18	81.7–93.6	86.44		
All recent	62	78.8–98.4	86.89±0.50	3.94±0.35	4.17
Birnirk	29	75.0–90.3	83.50±0.64	3.45±0.45	

[a] Tests only the difference between the Point Barrow and Barrow-Utkiavik series.

tion reported in summary form by Hrdlička.[1] Judging from these figures (representing the combined measurements of the two sides for fewer than 20 individuals of each sex) the Birnirk people did not differ appreciably from a miscellaneous group of recent (?) Seward Peninsula Eskimo. Unfortunately, the individual measurements on the Van Valin bones now cannot be located.

With this explanation of the collections with which I am dealing, I pass on to the statistical analysis of the cranial measurements set forth in Tables 27 and 28. Besides supplying the usual statistical constants, I have calculated the *t* values in cases in which the differences between the samples seemed large enough to warrant it. The following formula was used:

$$t = \frac{M_1 - M_2}{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}.$$

To interpret these *t* values, it is necessary to refer to a table of *t* to get the corresponding *P* values, the latter representing, as Simpson and Roe say, "the probability that a value would appear by chance in random sampling, expressed as a decimal fraction (1.00 is 100 per cent probability)."[2] In general, however, it can be said that when $N > 15$, a $t > 3$ is always significant, a $t > 2.5$ is usually significant, and a $t > 2$ is sometimes significant.[3] In this connection it should be noted that I have not extended any of the computations to groups of fewer than 20 individuals.

When the differences between the several series are viewed from the standpoint of significance, relatively few of the *t* values are > 3. Those that are > 3 show up mainly in the major vault diameters and in the indices based thereon. Thus, in general, the Birnirk sample from the Point Barrow Area tends to be longer, narrower, and higher-headed than the combined samples of the recent population from the same area. Otherwise the *t* values are much smaller and are highly variable between the two sexes. Probably this interseries and intersex variability would diminish with increase in sample size.

If, as also seems likely, the pattern of significant differences shown here persists on larger sampling, we have a picture that appears over and over again in the literature on the Eskimo. The picture is of a widespread but always easily recognizable type, with variants limited mainly to vault shape; while the face remains largely the same, the vault shifts from long, narrow, and high to short, broad, and less high. Also, this shift to a more rounded vault, so-called brachycephalization, appears to be a recent development which the Eskimo share with other racial groups all over the world.[4]

[1] Hrdlička, 1930, 327.
[2] Simpson and Roe, 1939, 207.
[3] Simpson and Roe, 1939, 207–209.
[4] Weidenreich, 1945; Hooton, 1946, 490–503.

TABLE 28

STATISTICAL COMPARISONS OF CRANIAL MEASUREMENTS: FEMALE

Group	No.	Range	Mean ± S.E.	σ ± S.E.	t
Maximum length					
Point Barrow	52	170–190	179.81 ± 0.60	4.30 ± 0.42	
Nixeruk	28	168–185	179.71 ± 0.72	3.82 ± 0.51	
Barrow-Utkiavik	54	162–189	178.89 ± 0.74	5.41 ± 0.52	
All recent	134	162–189	179.42 ± 0.41	4.71 ± 0.29	1.78
Birnirk	37	170–191	181.32 ± 0.98	5.98 ± 0.69	
Maximum breadth					
Point Barrow	52	128–142	133.85 ± 0.45	3.24 ± 0.28	
Nixeruk	28	128–142	135.28 ± 0.64	3.36 ± 0.45	1.94
Barrow-Utkiavik	54	125–142	133.63 ± 0.56	4.16 ± 0.40	
All recent	134	125–142	134.06 ± 0.32	3.72 ± 0.23	6.18
Birnirk	37	116–138	129.22 ± 0.71	4.34 ± 0.50	
Cranial index					
Point Barrow	52	68.4–78.4	74.48 ± 0.30	2.13 ± 0.21	1.48
Nixeruk	28	70.3–79.8	75.18 ± 0.37	1.96 ± 0.26	
Barrow-Utkiavik	54	69.8–81.9	74.65 ± 0.38	2.80 ± 0.27	
All recent	134	68.4–81.9	74.69 ± 0.21	2.41 ± 0.15	7.29
Birnirk	37	66.3–78.5	71.15 ± 0.44	2.67 ± 0.31	
Basion–bregma height					
Point Barrow	52	120–141	131.31 ± 0.56	4.02 ± 0.39	
Nixeruk	24	124–142	133.00 ± 0.91	4.47 ± 0.64	2.01
Barrow-Utkiavik	48	118–140	130.67 ± 0.72	4.96 ± 0.51	
All recent	124	118–142	131.23 ± 0.41	4.61 ± 0.29	2.80
Birnirk	34	120–140	133.47 ± 0.68	3.99 ± 0.48	
Mean height index					
Point Barrow	52	78.6–89.0	83.46 ± 0.33	2.36 ± 0.23	1.29
Nixeruk	24	79.3–89.3	84.25 ± 0.52	2.54 ± 0.37	
Barrow-Utkiavik	48	79.1–89.9	83.71 ± 0.36	2.52 ± 0.26	
All recent	124	78.6–89.9	83.71 ± 0.22	2.47 ± 0.16	5.20
Birnirk	34	80.4–91.3	86.26 ± 0.44	2.55 ± 0.31	
Cranial module					
Point Barrow	52	141.7–155.7	147.88 ± 0.42	3.00 ± 0.29	
Nixeruk	24	144.0–156.0	149.17 ± 0.62	3.05 ± 0.44	2.54
Barrow-Utkiavik	48	136.3–156.7	147.08 ± 0.54	3.74 ± 0.38	
All recent	124	136.3–156.7	147.82 ± 0.30	3.40 ± 0.22	
Birnirk	34	136.0–154.0	147.24 ± 0.64	3.74 ± 0.45	
Alveolar point–nasion					
Point Barrow	40	64–79	72.18 ± 0.52	3.31 ± 0.37	
Nixeruk	15	66–78	72.20		
Barrow-Utkiavik	31	61–82	72.03 ± 0.78	4.34 ± 0.55	
All recent	86	61–82	72.13 ± 0.40	3.75 ± 0.28	2.09
Birnirk	25	59–77	70.12 ± 0.88	4.38 ± 0.62	

TABLE 28—(*Continued*)

Group	No.	Range	Mean ± *S.E.*	$\sigma \pm S.E.$	*t*
Diameter bizygomatic maximum					
Point Barrow	46	123–139	131.13±0.53	3.60±0.38	
Nixeruk	22	124–136	131.36±0.71	3.35±0.50	
Barrow-Utkiavik	34	121–141	131.65±0.80	4.64±0.56	
All recent	102	121–141	131.35±0.39	3.93±0.28	0.54
Birnirk	31	117–142	131.90±0.94	5.24±0.67	
Facial index, upper					
Point Barrow	39	50.4–61.4	55.32±0.38	2.40±0.27	
Nixeruk	15	51.6–62.1	55.57		
Barrow-Utkiavik	28	47.7–61.6	54.96±0.60	3.20±0.43	
All recent	82	47.7–62.1	55.24±0.31	2.82±0.22	2.41
Birnirk	24	45.7–59.7	53.71±0.55	2.71±0.39	
Endobasion–nasion					
Point Barrow	52	90–108	99.35±0.51	3.67±0.36	1.71
Nixeruk	24	95–106	100.71±0.61	2.98±0.43	
Barrow-Utkiavik	48	92–109	100.46±0.53	3.67±0.37	
All recent	124	90–109	100.04±0.32	3.60±0.23	1.93
Birnirk	33	95–107	101.39±0.62	3.56±0.44	
Endobasion–subnasal point					
Point Barrow	46	80–96	87.26±0.49	3.34±0.35	1.35
Nixeruk	17	80–94	87.65		
Barrow-Utkiavik	38	79–95	88.32±0.61	3.77±0.43	
All recent	101	79–96	87.72±0.36	3.61±0.25	3.94
Birnirk	27	83–97	90.63±0.64	3.36±0.46	
Endobasion-prealveolar point					
Point Barrow	37	90–107	97.68±0.67	4.10±0.48	
Nixeruk	13	93–103	98.15		
Barrow-Utkiavik	31	87–107	98.58±0.84	4.67±0.59	
All recent	81	87–107	98.10±0.47	4.24±0.33	2.80
Birnirk	20	92–106	100.90±0.88	3.95±0.62	
Facial angle					
Point Barrow	37	63.0–76.0	69.57±0.46	2.83±0.33	1.60
Nixeruk	13	66.0–75.5	70.73		
Barrow-Utkiavik	29	64.0–76.0	70.67±0.50	2.72±0.36	
All recent	79	63.0–76.0	70.39±0.31	2.76±0.22	
Birnirk	20	65.0–75.0	70.90±0.52	2.32±0.37	
Alveolar angle					
Point Barrow	37	44.0–65.0	56.09±0.78	4.76±0.55	
Nixeruk	13	51.0–63.5	57.58		
Barrow-Utkiavik	29	49.0–65.0	56.09±0.78	4.21±0.55	
All recent	79	44.0–65.0	56.34±0.50	4.48±0.36	0.81
Birnirk	20	47.0–66.0	55.60±1.09	4.89±0.77	

TABLE 28—(*Continued*)

Group	No.	Range	Mean ± *S.E.*	$\sigma \pm S.E.$	*t*
Orbital height, right					
Point Barrow	41	30.0–38.5	35.72±0.26	1.68±0.18	
Nixeruk	16	32.0–38.5	35.62		
Barrow-Utkiavik	28	33.0–39.0	36.32±0.33	1.77±0.24	
All recent	85	30.0–39.0	35.90±0.19	1.76±0.13	1.49
Birnirk	20	32.0–37.5	35.30±0.35	1.58±0.25	
Orbital breadth, right					
Point Barrow	41	37.0–43.0	39.65±0.22	1.40±0.15	
Nixeruk	16	38.0–42.5	39.88		
Barrow-Utkiavik	28	36.5–42.5	39.71±0.30	1.53±0.21	
All recent	85	36.5–43.0	39.71±0.15	1.40±0.11	
Birnirk	20	33.5–42.0	39.35±0.43	1.91±0.30	
Orbital index, right					
Point Barrow	41	80.0– 97.4	90.12±0.56	3.63±0.40	1.41
Nixeruk	16	82.3– 95.1	89.75		
Barrow-Utkiavik	28	81.7– 97.5	91.50±0.80	4.23±0.56	
All recent	85	80.0– 97.5	90.51±0.42	3.89±0.30	
Birnirk	20	84.2–100.0	90.70±1.06	4.75±0.75	
Nasal height					
Point Barrow	46	46.0–56.0	51.42±0.36	2.42±0.25	1.08
Nixeruk	18	48.0–55.0	52.00		
Barrow-Utkiavik	36	45.0–61.0	52.11±0.52	3.15±0.37	
All recent	100	45.0–61.0	51.77±0.26	2.65±0.19	2.72
Birnirk	29	44.5–57.5	50.19±0.52	2.78±0.36	
Nasal breadth					
Point Barrow	46	20.0–26.0	23.26±0.21	1.42±0.15	
Nixeruk	18	19.0–25.0	23.11		
Barrow-Utkiavik	36	20.5–26.5	23.31±0.24	1.44±0.17	
All recent	100	19.0–26.5	23.25±0.14	1.46±0.10	
Birnirk	29	18.5–27.0	23.16±0.39	2.10±0.28	
Nasal index					
Point Barrow	46	39.2–53.2	45.11±0.51	3.45±0.36	
Nixeruk	18	36.5–50.0	44.44		
Barrow-Utkiavik	36	38.2–50.0	44.53±0.47	2.85±0.34	
All recent	100	36.5–53.2	44.78±0.32	3.23±0.23	1.41
Birnirk	29	38.3–58.4	46.09±0.87	4.68±0.62	
Upper alveolar arch, maximum length					
Point Barrow	33	47–59	52.52±0.47	2.70±0.33	
Nixeruk	13	48–55	51.38		
Barrow-Utkiavik	28	48–59	52.46±0.58	3.08±0.41	
All recent	74	47–59	52.30±0.32	2.80±0.10	0.99
Birnirk	22	48–58	52.96±0.58	2.72±0.41	

TABLE 28—(*Continued*)

Group	No.	Range	Mean ± *S.E.*	$\sigma \pm S.E.$	*t*
Upper alveolar arch, maximum breadth					
Point Barrow	33	53–66	60.12±0.59	3.42±0.42	1.82
Nixeruk	13	55–65	60.92		
Barrow-Utkiavik	27	54–68	61.67±0.61	3.17±0.43	
All recent	73	53–68	60.84±0.38	3.26±0.27	1.54
Birnirk	22	56–70	62.04±0.68	3.19±0.48	
Upper alveolar arch, index					
Point Barrow	33	74.2–100.0	87.50±0.90	5.16±0.63	1.99
Nixeruk	13	76.2– 90.9	84.42		
Barrow-Utkiavik	27	78.7– 93.6	85.13±0.78	4.07±0.55	
All recent	73	74.2–100.0	86.08±0.56	4.75±0.39	0.60
Birnirk	22	75.7– 93.2	85.41±0.96	4.50±0.68	

Secular change of this sort is not easily accounted for, except where population replacement has occurred. If it could be proved that the recent Eskimo population in the Point Barrow region was descended directly from the earlier Birnirk people, then the problem of accounting for the change in physical type would indeed be formidable, because Eskimo environment, taking this term in its widest sense, seems to have remained fairly constant at Point Barrow for a very long time. However, as Ford states in the letter quoted above, the Eskimo most recently living at Point Barrow came there from the interior in historic times. Also, he points to the possibility that the Nixeruk group may be a little older than the Barrow-Utkiavik group. Yet the figures seem to show that, of the three recent groups, Nixeruk deviates most from Birnirk.

In view of the uncertainties about recent population movements, our inability to date surface collections accurately, and the lack of information on collections from other early sites, I think that further discussion of the present findings is unwarranted. Besides, Collins has gone about as far as possible in reviewing the evidence from physical anthropology now available.[1]

Because the main purpose of this report on the skeletal material has been to straighten out the record and thereby to define more accurately the physical type of the bearers of the Birnirk culture, it is desirable to add a few pictures of the skulls. Unfortunately, most of the Birnirk skulls collected by Ford are not well preserved. For this reason all but one of the six skulls here reproduced (Pls. 8–13) are from the Van Valin Collection recently transferred to the United States National Museum. The selection presented should give an idea of the type and the variations in individual size.

[1] Collins, 1951.

LITERATURE CITED

ANON.
1930. Archaeological work in Alaska. Bull. Univ. Mus., Univ. Pennsylvania, vol. 1, no. 3, pp. 10–14.

BEREGOVAYA, N. A.
1953. Harpoon heads from ancient settlements on Cape Barrow. 1946 Excavations of the Kolima expedition. *In* Materials and Researches in Archaeology SSSR. Moscow, no. 39, pp. 421–445. (In Russian.)

BIRKET-SMITH, KAJ
1928. The Greenlanders of the present day. *In* Greenland. II. The past and present population of Greenland. Copenhagen, Commission for the Direction of the Geological and Geographical Investigations in Greenland, pp. 1–207.

BLACK, ROBERT F., AND WILLIAM L. BARDSDALE
1949. Oriented lakes of northern Alaska. Jour. Geol., vol. 57 , no. 2, pp. 105–118.

BOAS, FRANZ
1907. Second report on the Eskimo of Baffin Land and Hudson Bay. Bull. Amer. Mus. Nat. Hist., vol. 15, pt. 2.

COLLINS, HENRY B., JR.
1929. Prehistoric art of the Alaskan Eskimo. Smithsonian Misc. Coll., vol. 81, no. 14.
1933. Archaeological investigations at Point Barrow, Alaska. Exploration and Field-Work Smithsonian Inst., 1932, pp. 45–48.
1934. Eskimo archaeology and somatology. Amer. Anthrop., vol. 36, no. 2, pp. 309–313.
1937. Archeology of St. Lawrence Island, Alaska. Smithsonian Misc. Coll., vol. 96, no. 1.
1950. Excavations at Frobisher Bay, Baffin Island, Northwest Territories (preliminary report). Ann. Rept. Natl. Mus. Canada, 1948–1949, Bull. 118, pp. 18–43.
1951. The origin and antiquity of the Eskimo. Ann. Rept. Smithsonian Inst., for 1950, pp. 423–467.
1952. Archaeological excavations at Resolute, Cornwallis Island, N. W. T. Ann. Rept. Natl. Mus. Canada, 1950–1951, Bull. 126, pp. 48–63.
1953. Recent developments in the Dorset culture area in Asia and North American trans-Pacific contacts. Mem. Soc. Amer. Archaeol., no. 9, pp. 32–39.
1956. The T 1 Site at Native Point, Southampton Island, N. W. T. Anthrop. Papers Univ. Alaska, vol. 4, no. 2, 1956, pp. 63–89.

COLTON, HAROLD S., AND LYNDON L. HARGRAVE
1937. Handbook of northern Arizona pottery wares. Bull. Mus. Northern Arizona, Flagstaff, no. 11.

DE LAGUNA, FREDERICA
1934. The archaeology of Cook Inlet, Alaska. Philadelphia, University of Pennsylvania Press.
1947. The prehistory of northern North America as seen from the Yukon. Mem. Soc. Amer. Archaeol., no. 3.

FORD, JAMES A.
1952. Measurements of some prehistoric design developments in the southeastern states. Anthrop. Papers Amer. Mus. Nat. Hist., vol. 44, pt. 3.

GEIST, OTTO W., AND FROELICH G. RAINEY
1936. Archaeological excavations at Kukulik, St. Lawrence Island, Alaska. Misc. Publ. Univ. Alaska, vol. 2.

GIDDINGS, J. L., JR.
1952. The Arctic woodland culture of the Kobuk River. Mus. Monogr., Univ. Mus., Univ. Pennsylvania.

HARP, ELMER
1953. New World affinities of Cape Dorset culture. Anthrop. Papers Univ. Alaska, vol. 1, no. 2, pp. 37–54.

HOLTVED, ERIK
1944. Archaeological investigations in the Thule district. Meddel. om Grønland, vol. 141, no. 2.

HOOTON, EARNEST A.
1946. Up from the ape. Revised edition. New York, the Macmillan Co., 788 pp.

HOUGH, WALTER
1895. Primitive American armor. Ann. Rept. U. S. Natl. Mus., for 1893, pp. 625–651.

HRDLIČKA, ALEŠ
1924. Catalog of human crania in the United States National Museum collections: the Eskimo, Alaska and related Indians, northeastern Asiatics. Proc. U. S. Natl. Mus., vol. 63, art. 12, pp. 1–51.
1930. Anthropological survey in Alaska. 46th Ann. Rept. Bur. Amer. Ethnol., for 1928–1929, pp. 19–374.
1942. Catalog of human crania in the United States National Museum collections: Eskimo in general. Proc. U. S. Natl. Mus., vol. 91, no. 3131, pp. 169–429.

JOCHELSON, WALDEMAR
1928. Archaeological investigations in Kamchatka. Publ. Carnegie Inst. Washington, no. 388.

KNUTH, EIGIL
1952. An outline of the archaeology of Peary

Land. Arctic, Jour. Arctic Inst. North Amer., Ottawa, vol. 5, no. 1, pp. 17–33.

LARSEN, HELGE
1952. Recent developments in Eskimo archaeology. Actes IV Congr. Internatl. Sci. Anthrop. Ethnol., Vienna, vol. 2.

LARSEN, HELGE, AND FROELICH G. RAINEY
1948. Ipiutak and the Arctic whale hunting culture. Anthrop. Papers Amer. Mus. Nat. Hist., vol. 42.

LEFFINGWELL, ERNEST DE K.
1919. The Canning river region of northern Alaska. Prof. Paper U. S. Geol. Surv., no. 109.

LIBBY, WILLARD F.
1955. Radiocarbon dating. Second edition. Chicago, Chicago University Press.

MACHINSKII, A. V.
1941. Old Eskimo culture on the Chukchi Peninsula. Short Commun. Inst. Hist. Material Cult., Moscow, no. 9, pp. 80–89. (In Russian.)

MANNING, T. H.
1956. Narrative of a second defense research board expedition to Banks Island, with notes on the country and its history. Arctic, Jour. Arctic Inst. North Amer., Ottawa, vol. 9, nos. 1 and 2, pp. 3–77.

MASON, J. ALDEN
1930. Excavations of Eskimo Thule culture sites at Point Barrow, Alaska. Proc. 23d Internatl. Congr. Americanists, New York, 1928, pp. 383–394.

MATHIASSEN, THERKEL
1927a. Archaeology of the Central Eskimos. I. Descriptive Part. Report of the Fifth Thule Expedition, 1921–24. The Danish expedition to Arctic North America in charge of Knud Rasmussen. Copenhagen, vol. 4, pt. 1.
1927b. Archaeology of the Central Eskimos. II. The Thule culture and its position within the Eskimo culture. *Op. cit.* Copenhagen, vol. 4, pt. 2.
1928. Material culture of the Iglulik Eskimos. *Op. cit.* Copenhagen, vol. 6, no. 1.
1930. Archaeological collections from the Western Eskimos. *Op. cit.* Copenhagen, vol. 10, no. 1.

MELDGAARD, JØRGEN
1952. A Paleo-Eskimo culture in West Greenland. Amer. Antiquity, vol. 17, no. 3, pp. 225–229.
1955. Dorset culture. The Danish-American expedition to Arctic Canada, 1954. Kuml, Arbog Jysk Arkaeol. Selskab, pp. 158–177. (In Danish; summary in English.)

MURDOCH, JOHN
1892. The ethnological results of the Point Barrow expedition. Ninth Ann. Rept., Bur. Amer. Ethnol.

NELSON, EDWARD W.
1899. The Eskimo about Bering Strait. Eighteenth Ann. Rept., Bur. Amer. Ethnol., pt. 1.

OSWALT, WENDELL
1955. Alaskan pottery: a classification and historical reconstruction. Amer. Antiquity, vol. 21, no. 1, pp. 32–43.

PHILLIPS, PHILIP, JAMES A. FORD, AND JAMES B. GRIFFIN
1951. Archaeological survey in the lower Mississippi alluvial valley, 1940–1947. Papers Peabody Mus. Amer. Archaeol. Ethnol., Harvard Univ., vol. 25.

RAINEY, FROELICH G.
1941. Eskimo prehistory: the Okvik site on the Punuk Islands. Anthrop. Papers Amer. Mus. Nat. Hist., vol. 37, pt. 4.

RAY, PATRICK H.
1885. Report of the international polar expedition to Point Barrow, Alaska, in response to the resolution of the House of Representatives of December 11, 1884. Washington.

RITCHIE, WILLIAM A.
1951. A current synthesis of New York prehistory. Amer. Antiquity, vol. 17, no. 2, pp. 130–136.

RUDENKO, S. A.
1947. The old Bering Sea Culture and the Eskimo problem. Moscow and Leningrad. (In Russian.)

SIMPSON, GEORGE GAYLORD, AND ANNE ROE
1939. Quantitative zoology. New York, McGraw-Hill Book Co.

STEFÁNSSON, VILHJALMUR
1914. The Stefánsson-Anderson Arctic expedition of the American Museum: preliminary ethnological report. Anthrop. Papers Amer. Mus. Nat. Hist., vol. 14, pt. 1.

STEWART, T. D.
1943. Variation in the technique of measuring skulls. Anthrop. Briefs, no. 2, pp. 1–6.
1954. Sex determination of the skeleton by guess and by measurement. Amer. Jour. Phys. Anthrop., new ser., vol. 12, no. 3, pp. 385–392.

THALBITZER, WILLIAM (ED.)
1914. The Ammassalik Eskimo. Contributions to the ethnology of the East Greenland natives. Part 1. Meddel. om Grønland, vol. 39, pp. 1–755.

VAN VALIN, WILLIAM B.
1941. Eskimo land speaks. New York.

WEIDENREICH, FRANZ
1945. The brachycephalization of recent mankind. Southwestern Jour. Anthrop., vol. 1, pp. 1–54.
WISSLER, CLARK
1916. Harpoons and darts in the Stefánsson collection. Anthrop. Papers Amer. Mus. Nat. Hist., vol. 14, pt. 2.
WORMINGTON, H. M.
1957. Ancient man in North America. Second edition. Popular Ser. Denver Mus. Nat. Hist., no. 4.

CATALOGUE DATA FOR CERTAIN ILLUSTRATIONS[1]

PLATES

8. Male skull from Burial Mound A, House E, Birnirk, collected by Ford (365904)
9. Male skull collected by Van Valin at Kugusugaruk (381113; field no. 1–21)
10. Male skull collected by Van Valin at Kugusugaruk (381123; field no. 4–19)
11. Female skull collected by Van Valin at Kugusugaruk (381098; field no. 3–12)
12. Female skull collected by Van Valin at Kugusugaruk (381116; field no. 1–1)
13. Female skull collected by Van Valin at Kugusugaruk (381121; field no. 1–16)

TEXT FIGURES

4. Wooden bows secured by Van Valin at the Kugusugaruk burial site (University of Pennsylvania Museum catalogue numbers)
   a. Igloo 1 or 4 (29-90-601A)
   b. (29-90-604)
   c. Igloo 1 or 4 (29-90-602B)
9. Artifacts accompanying burials in Kugok Mounds A and B
   a. Burial 6, Mound A (401531)
   b. Find 5, Burial 4, Mound A (416778)
   c. Find 5, Burial 8, Mound B (416777)
   d. Find 5, Burial 8, Mound B (416775)
   e. Burial 6, Mound A (401531)
   f. Find 14, Burial 5, Mound A (401607)
   g. Find 5, Burial 8, Mound B (401569)
   h. Find 5, Burial 8, Mound B (401569)
   i. Find 1, Burial 1, Mound B (416776)
   j. Find 5, Burial 8, Mound B (401569)
   k. Find 1, Burial 1, Mound B (401596)
   l. Burial 3, Mound B (401565)
   m. Find 5, Burial 8, Mound B (401567)
   n. Find 3, Burial 4, Mound B (401606)
   o. Find 5, Burial 8, Mound B (401573)
   p. Find 5, Burial 4, Mound A (416779)
   q. Find 14, Burial 5, Mound A (416773)
   r. Find 13, Burial 6, Mound A (416774)
   s. Find 5, Burial 8, Mound B (401572)
10. Artifacts from Kugok Mounds A and F
   a. Find 9, Burial 6, Mound A (401535)
   b. Find 9, Burial 6, Mound A (401535)
   c. Burial 6, Mound A (401845)
   d. Mound F (401656)
15. Thin, wooden, dish-like object found with the burials, floor of Structure E, Mound A, Birnirk (399516)
21. Artifacts from the structures beneath Mound C, Nunagiak, and from the adjacent beach of the lagoon
   a. Burial 1, Mound C (401225)
   b. Burial 1, Mound C (401223)
   c. Burial 1, Mound C (401219)
   d. Burial 1, Mound C (401219)
   e. Find 1, Mound C (401181)
   f. Find 1, Mound C (401182)
   g. Find 1, Mound C (401176)
   h. Find 1, Mound C (401178)
   i. Structures exposed on beach, below Mound C, purchase (400964)
   j. Find 1, Mound C (401175)
   k. Find 1, Mound C (416772)
   l. Punuk house, beneath beach, partially under water (400892)
   m. Purchase (416770)
   n. Purchase (416772)
   o. Purchase (416771)
   p. Mound C, purchase (400880)
22. Complete arrow, Burial 1, Structure F, below Mound C, Nunagiak (401216)
23. Scapula snow shovel with handle, Entrance Tunnel D, below Mound C, Nunagiak (401280)
26. Harpoon heads of Birnirk Type from the Birnirk Site
   a. House A, Mound R (416767)
   b. Timbers below Structure C, Mound A (399063)
   c. Cut 12, Mound A (399312)
   d. Cut 3, Section 3, Mound A (399350)
   e. Cut 3, Section 1, Mound A (399316)
   f. Among roof timbers of House A, Mound C (416766)
   g. House floor, Mound B (398831)
   h. Structure B, below floor, Mound A (398958)
   i. Below Structure C, Mound A (399086)
   j. Cut 4, above roof timbers of House A, Mound A (416768)
   k. Mound H, gift from Mrs. Charles Brower (398908)
   l. Floor of House A, Mound A (399185)
   m. House floor, Mound B (398833)
   n. Roof of House A, Mound A (399142)
   o. Cut 2, Section 2, Mound A (399262)
   p. Cut 2, Section 1, Mound A (399260)
27. Harpoon heads of Alilu, Oopik, and Naulock types from the Birnirk Site
   a. Alilu, timbers at north side of Cut 1 (416735)

[1] Unless otherwise specified, the specimen numbers are those of the United States National Museum catalogue.

b. Oopik, Morgan Collection (416740)
c. Oopik, floor of Structure H, Mound A (416739)
d. Oopik, floor of Structure H, Mound A (416737)
e. Oopik, Stefánsson Collection (A.M.N.H. 60-9294)
f. Naulock, among entrance timbers, Mound J (416738)
g. Naulock, Cut 7, Section 3, Mound D (398986)
h. Cut 2, Section 4, Mound A (399289)
i. Floor of House A, Mound A (399224)
j. Structure E, Mound A (416736)

28. Harpoon heads of Tuquok, Katoktok, Tipiruk, and Tasik types
a. Tuquok, below floor of Structure C, Mound A, Birnirk (399045)
b. Tuquok, floor of Structure H, Mound A, Birnirk (416711)
c. Tuquok, floor of House A, Mound A, Birnirk (399186)
d. Tuquok, Cut 7, Section 2, Mound D, Birnirk (398981)
e. Tuquok, Cut 4, below surface outside House A, Birnirk (416755)
f. Tuquok, layer of seal bones north of Structure C, Mound A, Birnirk (399028)
g. Katoktok, structures exposed on beach below Mound C, Nunagiak, purchase (400891)
h. Tipiruk, floor of House A, Mound J, Birnirk (416712)
i. Tipiruk, Cut 2, Section 3, Mound A, Birnirk (399269)
j. Tipiruk, Cut 3, Section 2, Mound A, Birnirk, purchase (399335)
k. Tipiruk, miscellaneous from beach around Mound C, Nunagiak (400918)
l. Tipiruk, floor of Structure H, Mound A, Birnirk (416713)
m. Tasik, floor of Structure C, Mound A, Birnirk (399030)
n. Tasik, floor of Structure E, Mound A, Birnirk (416709)
o. Tasik, among wall timbers of Structure G, Mound A, Birnirk (399517)
p. Tasik, floor of Structure E, Mound A, Birnirk (416710)
q. Tasik, floor of Structure B, Mound A, Birnirk (398921)
r. Tasik, floor deposit of Structure E, Mound A, Birnirk (416714)
s. Tasik, Cut 1, below floor of Structure B, layer of seal bones, Mound A, Birnirk (398922)

29. Harpoon heads of Natchuk Type
a. Nunagiak, purchase (401104)
b. Structures exposed on beach below Mound C, Nunagiak, purchase (400892)
c. Below surface, north side of Cut 12, Mound A, Birnirk (399298)
d. Structure E, Mound A, Birnirk (416753)
e. Below Structure C, Mound A, Birnirk (399046)
f. Floor deposit, Structure E, Mound A, Birnirk (416752)
g. Floor of Structure H, Mound A, Birnirk (416749)
h. Floor of House A, Mound J, Birnirk (416747)
i. Cut 3, Section 1, Mound A, Birnirk (399315)
j. Floor of Structure H, Mound A, Birnirk (416749)
k. Cut 12, Section 2, above roof timbers, Mound A, Birnirk (399305)
l. Floor deposit of Structure E, Mound A, Birnirk (416748)
m. Birnirk, purchase (416751)
n. House B, Utkiavik, purchase (400284)
o. Structure E, Mound A, Birnirk (416750)
p. Floor of Structure E, Mound A, Birnirk (416746)

30. Harpoon heads of Sicco and Thule 2 types
a. Sicco, structures exposed on beach below Mound C, Nunagiak, purchase (400881)
b. Sicco, structures exposed on beach below Mound C, Nunagiak, purchase (400891)
c. Thule 2 Type, above Punuk house, Nunagiak (400954)
d. Thule 2 Type, above Punuk house, Nunagiak (400954)
e. Thule 2 Type, Cut 2, Section 5, Mound F, Nunagiak (401008)
f. Thule 2 Type, Nunagiak, purchase (401104)
g. Thule 2 Type, Nunagiak, purchase (401104)
h. Thule 2 Type, Nunagiak, purchase (401104)
i. Thule 2 Type, structures exposed on beach below Mound C, Nunagiak, purchase (400881)
j. Thule 2 Type, Nunagiak, purchase (401104)
k. Thule 2 Type, under roof timbers in northeast corner, Cut 2, Section 2, Mound A, Birnirk (416741)
l. Thule 2 Type, Cut 3, Section 4, Nuvuwaruk (401486)
m. Thule 2 Type, Utkiavik, purchase (400194)
n. Thule 2 Type, Cut 1, Section 2, Utkiavik (416742)
o. Thule 2 Type, Barrow, donated by Charles Brower (401758)

31. Harpoon heads of Nunagiak and Kilimatavik types
a. Nunagiak, Cut 2, Section 2, Mound A, Nunagiak (400985)

b. Nunagiak, Cut 2, Section 2, Mound A, Nunagiak (400985)
c. Nunagiak, House B, Utkiavik, purchase (400284)
d. Nunagiak, Cut 2, Section 2, Mound A, Nunagiak (400985)
e. Nunagiak, Utkiavik, purchase (400124)
f. Nunagiak, Nunagiak, purchase (401104)
g. Nunagiak, Cut 2, Section 2, Mound A, Nunagiak (400985)
h. Nunagiak, Utkiavik, purchase (400068)
i. Nunagiak, Utkiavik, purchase (400068)
j. Nunagiak, Utkiavik, purchase (400194)
k. Kilimatavik, Nunagiak, purchase (401104)
l. Kilimatavik, above timbers, entrance to House A, Mound A, Utkiavik (416715)
m. Kilimatavik, above roof entrance to House A, Utkiavik (416716)
n. Kilimatavik, Kilimatavik, purchase (401735)
o. Kilimatavik, Kilimatavik, purchase (401735)
p. Kilimatavik, Kilimatavik, purchase (401735)

32. Harpoon heads of Cape Smythe, Brower, Kuk, and Barrow types
a. Cape Smythe, Cut 2, Section 1, Utkiavik (400419)
b. Cape Smythe, from southern end, Utkiavik, purchase (400395)
c. Cape Smythe, Cut 4, Section 2, Utkiavik (400353)
d. Cape Smythe, Utkiavik, purchase (400194)
c. Brower, over roof of House A, Utkiavik (416754)
f. Brower, over roof of House A, Utkiavik (416803)
g. Brower, Utkiavik, purchase (400194)
h. Kuk, Utkiavik, purchase (400194)
i. Kuk, Nuwuk, purchase (399886)
j. Kuk, Nuwuk, purchase (399833)
k. Barrow vicinity, purchase (399743)
l. Barrow, Utkiavik, purchase (400124)
m. Barrow, Barrow vicinity, purchase (399743)
n. Barrow, Utkiavik, purchase (400124)

33. Harpoon heads of Nuwuk and Utkiavik types
a. Nuwuk, Cut 1, Section 2, Nuwuk (400838)
b. Nuwuk, Cut 1, Section 2, Nuwuk (400839)
c. Nuwuk, Utkiavik, purchase (400194)
d. Nuwuk, Cut 1, Section 1, House G, Nunagiak (416744)
e. Nuwuk, Cut 1, Section 1, House G, Nunagiak (416745)
f. Utkiavik, Utkiavik, purchase (416743)
g. Utkiavik, near surface, Cut 1, Mound A, Utkiavik, purchase (400712)
h. Utkiavik, Utkiavik, purchase (400194)
i. Utkiavik, House B, purchase (400284)

36. Varieties of harpoon head blades found in the Point Barrow Area
a. House A, Utkiavik (400587)
b. Cut 2, Section 5, Utkiavik (400476)
c. Nunagiak (401358)
d. Cut 2, Mound A, Birnirk (399255)
e. Entrance D, Mound C, Nunagiak (401243)
f. Cut 2, Section 3, Mound A, Nunagiak (400976)

37. Harpoon gear from Nuwuk and Utkiavik
a. Nuwuk, purchase (399912)
b. Utkiavik, purchase (399985)
c. Utkiavik, purchase (400197)
d. Utkiavik, purchase (400099)
e. Utkiavik, purchase (400099)
f. Above House A, Utkiavik (400710)
g. Type B, House B, Utkiavik, purchase (400285)
h. Type B foreshaft, House B, Utkiavik (400285)
i. Above House A, Utkiavik (400723)
j. Cut 2, Section 1, Utkiavik (400449)
k. House B, Utkiavik (400317)
l. Cut 2, Section 1, Utkiavik (400415)
m. House B, Utkiavik (400305)
n. Cut 4, Section 2, Utkiavik (400367)
o. Above House A, Utkiavik (400609)
p. Floor of House A, Utkiavik (400593)
q. Location X, Utkiavik (400397)

38. Harpoon gear from Nunagiak
a. Entrance D, Mound C (401267)
b. From beach near Mound C (400909)
c. Cut 2, Section 5 (401017)
d. Entrance D, Mound C (401272)
e. Cut 2, Section 2 (401411)
f. Mound above Punuk house (400894)
g. Above Punuk house, Mound C (400962)
h. Entrance D, Mound C (401259)

39. Harpoon gear from Birnirk
a. Cut 3, Section 7, Mound A (399387)
b. Floor of Structure D, Mound A (399113)
c. Floor of Structure G, Mound A (399521)
d. House floor, Mound B (398853)
e. Cut 8, Section 5, Mound G (399099)
f. Floor of House A, Mound A (399157)
g. Floor of Structure D, Mound A (399112)
h. House A, Mound R (399563)
i. House A, Mound B (398886)
j. House floor deposit, Mound B (398851)
k. Structure H, Mound A (399446)
l. Below floor of Structure C, Mound A (399080)
m. Roof of House A, Mound A (399218)
n. Cut 2, Section 1, Mound A (399257)
o. Cut 3, Section 7, Mound A (399407)

40. Harpoon gear from Birnirk
a. Floor of House A, Mound A (399213)
b. Floor of House A, Mound A (399213)
c. Cut 3, Section 7, Mound A (399385)
d. Floor of House A, Mound A (399230)
e. Cut 3, Section 7, Mound A (399389)

f. Below floor of House A, Mound A (398943)
g. Cut 13, Section 1 (399700)
h. Floor of House A, Mound A (399189)
i. Cut 9, Section 7, Mound H (398895)
j. Floor of House A, Mound A (399180)
k. Cut 3, Section 7, Mound A (399386)

41. Wound plugs and pins from Birnirk
a. Cut 12, Mound A (416795)
b. Cut 3, Section 7, Mound A (399393)
c. Cut 3, Section 2, Mound A (399338)
d. Cut 8, Section 4, Mound G (399006)

42. Ice scoops from the recent sites
a. Nuwuk, purchase (399839)
b. House B, Utkiavik (400308)
c. Nuwuk, purchase (399915)
d. Nuwuk, purchase (399915)

43. Ice scoop parts from Birnirk
a. Cut 3, Section 1, Mound A (399410)
b. Floor of House A, Mound J (399602)
c. Cut 3, Section 7, Mound A (399412)
d. Below house, Mound A (399098)

44. Ice scoop with baleen rim and netting from timbers below Structure C, Mound A, Birnirk (399125)

45. Darting harpoon gear and seal netting equipment from the later deposits
a. Nuwuk, purchase (399809)
b. Utkiavik, purchase (400197)
c. Nuwuk, purchase (399921)
d. Over entrance of House A, Utkiavik (401844)
e. Nunagiak, purchase (401104)
f. House A, Utkiavik (400656)
g. Cut 2, Section 1, Utkiavik (400416)
h. Cut 2, Section 6, Nunagiak (401038)
i. Nuwuk, purchase (399814)
j. Entrance D, Mound C, Nunagiak (401191)
k. Entrance D, Mound C, Nunagiak (401199)
l. Nuwuk, purchase (399898)
m. Nuwuk, purchase (399837)
n. House B, Utkiavik (400304)
o. Nuwuk, purchase (399869)
p. Nuwuk, purchase (399917)
q. Above House A, Utkiavik (400810)

46. Baleen fish net from above House A, Cut 1, Utkiavik (400621)

47. Bone knife, above House A, Utkiavik (400675)

48. Atlatl gear from Nunagiak
a. Presented by George A. Morelander (416758)
b. Entrance D, Mound C (401200)
c. Structure E, Mound C (401123)
d. Find 1, Mound C (401256)
e. Purchase (401107)
f. Purchase (401107)

49. An atlatl from the floor of entrance to House A, Mound A, Birnirk Site (399126)

50. Atlatl gear from Birnirk
a. Floor entrance of House A, Mound A (399127)
b. Cut 12, Section 1, Mound A (399304)
c. House floor, Mound C (398842)
d. Floor entrance, House A, Mound A (399128)
e. House floor, Mound B (398839)
f. Cut 11, below Burial 3, Mound R (416780)
g. Miscellaneous, Mound J (416782)
h. Floor deposit, Mound C (398840)
i. Structure E, Mound A (399506)
j. Cut 1, Section 3, floor of House A, Mound J (416781)

51. Atlatl parts from Birnirk
a. Cut 2, Section 4, Mound A (399283)
b. Below floor of Structure B, Mound A (398932)
c. Structure H, Mound A (399428)
d. Cut 3, Section 2, Mound A (399333)

52. Bird dart side prongs from Utkiavik
a. Purchase (400211)
b. Over entrance to House A (416733)

53. Bow gear from Nuwuk and Utkiavik
a. Nuwuk, purchase (399878)
b. Nuwuk, purchase (399810)
c. Nuwuk, purchase (399810)
d. Cut 1, House A, Utkiavik (400528)
e. Above House A, Utkiavik (400661)
f. House B, Utkiavik (400311)
g. Above House A, Utkiavik (400722)
h. Above House A, Utkiavik (400815)
i. House B, Utkiavik (400320)
j. Cut 2, Section 1, Utkiavik (400404)
k. Utkiavik, purchase (400189)
l. Cut 1, House A, Utkiavik (400628)

54. Bow gear from Nunagiak
a. Cut 2, Section 4 (400988)
b. Cut 2, Section 3 (400975)
c. Purchase (401151)
d. Cut 2, Section 6 (401035)

55. Bow gear of Birnirk Period
a. Structure H, Mound A, Birnirk (399440)
b. Floor of Structure D, Mound A, Birnirk (399108)
c. Cut 2, Section 2, Nunagiak (401410)
d. Cut 4, floor of Structure C, Mound A, Birnirk (399027)
e. Cut 3, Section 7, Mound A, Birnirk (399397)
f. Cut 3, Section 7, Mound A, Birnirk (399397)
g. Cut 3, Section 7, Mound A, Birnirk (399397)
h. Burial 3, Structure E, Mound A, Birnirk (399465)
i. House A, Mound A, Birnirk (399149)
j. Cut 9, Section 1, Mound I, Birnirk (398902)
k. Cut 3, Section 2, Nuvuwaruk (401499)
l. House floor deposit, Mound B, Birnirk (398844)

m. Cut 3, Section 7, Mound A, Birnirk (399403)
56. Portion of a bow case made of de-haired sealskin, from House A, Mound C, Birnirk (398890)
57. Antler arrowpoints, principally from Nuwuk and Utkiavik
a. Nunagiak, purchase (401107)
b. Nunagiak, purchase (401107)
c. Cut 1, Section 1, Utkiavik (400793)
d. Cut 2, Section 5, Mound F, Nunagiak (401005)
e. Utkiavik, purchase (400066)
f. Below House A, Utkiavik (400567)
g. Utkiavik, purchase (400066)
h. Utkiavik, purchase (399982)
i. Utkiavik, purchase (400218)
j. House B, Utkiavik (400286)
k. Cut 1, Section 1, Utkiavik (400793)
l. Utkiavik, purchase (400218)
m. Utkiavik, purchase (400257)
n. Nuwuk, purchase (399890)
o. Nuwuk, purchase (399826)
p. Nuwuk, purchase (399890)
q. Barrow vicinity, purchase (399741)
r. Below surface, House A, Mound A, Utkiavik (399890)
s. Utkiavik, purchase (400212)
t. Utkiavik, purchase (400212)
u. Utkiavik, purchase (400212)
v. Utkiavik, purchase (400120)
w. Utkiavik, purchase (400218)
x. Nuwuk, purchase (399890)
y. Utkiavik, purchase (400212)
z. Utkiavik, purchase (400212)
a'. Utkiavik, purchase (400212)
b'. Nuwuk, purchase (399826)
c'. Utkiavik, purchase (400212)
d'. Utkiavik, purchase (400212)
58. Antler arrowpoints, principally from Nuwuk and Utkiavik
Spurred tang single barb
a. Utkiavik, purchase (400120)
b. Nuwuk, purchase (399892)
c. Utkiavik, purchase (400218)
d. Utkiavik, purchase (400218)
e. Utkiavik, purchase (400218)
f. Cut 2, Section 2, Nunagiak (401417)
g. Nunagiak, purchase (401107)
h. Utkiavik, purchase (400218)
Spurred tang notched points
i. Utkiavik, purchase (400120)
j. Utkiavik, purchase (400066)
k. House B, Utkiavik, purchase (400218)
l. Nuwuk, purchase (399830)
m. Utkiavik, purchase (400066)
n. Nuwuk, purchase (399892)
o. Above Punuk house, Nunagiak (400962)
p. Nuwuk, purchase (399832)
With stone points
q. Nunagiak, purchase (401107)
r. House B, Utkiavik, purchase (400282)
s. Utkiavik, purchase (400066)
Spurred tang multiple barbs
t. House B, Utkiavik (400282)
u. Utkiavik, purchase (400120)
v. Utkiavik, purchase (400066)
w. Utkiavik, purchase (400120)
x. Cut 2, Section 5, Mound F, Nunagiak (401005)
59. Antler arrowpoints, principally from Nunagiak
Barbed points with knobbed tang
a. Find 1, Mound C, Nunagiak (401254)
b. Nunagiak, purchase (401107)
c. Burial 1, Mound C, Nunagiak (401218)
d. Structure E, Mound C, Nunagiak (401205)
e. Nunagiak, purchase (401107)
f. Nunagiak, purchase (401107)
Long serrated
g. Cut 3, Section 4, Nunagiak (401024)
h. Utkiavik, purchase (416760)
i. House B, Utkiavik, purchase (400282)
j. Below floor, House A, Utkiavik (416762)
k. Utkiavik, purchase (416761)
l. Nunagiak, purchase (401107)
m. Nunagiak, purchase (401107)
60. Arrows and antler points with knobbed tangs, principally from Birnirk
a. Structure G, Mound A, Birnirk (399527)
b. Structure G, Mound A, Birnirk (399527)
c. Structure G, Mound A, Birnirk (399527)
d. Structure G, Mouhd A, Birnirk (399527)
e. Structure H, Mound A, Birnirk (399423)
f. Timbers below Structure F, Mound A, Birnirk (399540)
g. Structures on beach, below Mound C, Nunagiak (416759)
61. Arrows and points with tapering tangs from Kugok, Birnirk, and Nunagiak
a. Find 1, Burial Mound B, Kugok (401525)
b. Find 6, Burial Mound B, Kugok (401523)
c. Find 6, Burial Mound B, Kugok (401523)
d. Find 6, Burial Mound B, Kugok (401523)
e. Find 6, Burial Mound B, Kugok (401523)
f. Find 6, Burial Mound B, Kugok (401523)
g. Cut 2, Section 4, Mound A, Birnirk (399288)
h. Floor of House A, Mound A, Birnirk (399204)
i. Floor of House A, Cut 1, Section 3, Birnirk (416769)
j. Structure E, Mound A, Birnirk (399506)
k. Entrance Tunnel D, Mound C, Nunagiak (401290)
l. Nunagiak, purchase (401107)
m. Cut 12, Section 1, Mound A, Birnirk (399307)
n. Cut 3, Section 2, Mound A, Birnirk (399336)
64. Classes of flint arrowheads

Class 1 (2), Utkiavik, purchase (400189)
Class 2 (2), Utkiavik, purchase (400189)
Class 3 (2), Utkiavik, purchase (400189)
Class 4, above Punuk house, Mound C, Nunagiak (400952)
Class 4, Cut 4, over House C, Mound A, Birnirk (399018)
Class 5, Find 1, Burial 1, Mound B, Kugok (416776)
Class 5, Find 5, Burial 8, Mound B, Kugok (401569)

66. Bolas ball types A to M
    a. Type A, Utkiavik, purchase (400095)
    b. Type A, Utkiavik, purchase (400095)
    c. Type B, Utkiavik, purchase (400095)
    d. Type B, Utkiavik, purchase (400095)
    e. Type C, Utkiavik, purchase (400095)
    f. Type C, Utkiavik, purchase (400095)
    g. Type C, Utkiavik, purchase (400095)
    h. Type D, Utkiavik, purchase (399953)
    i. Type D, Utkiavik, purchase (399953)
    j. Type D, over House A, Utkiavik (400738)
    k. Type E, Utkiavik, purchase (400095)
    l. Type E, Utkiavik, purchase (400095)
    m. Type E, Utkiavik, purchase (400095)
    n. Type F, Utkiavik, purchase (400019)
    o. Type F, Utkiavik, purchase (400095)
    p. Type F, Utkiavik, purchase (399953)
    q. Type G, Utkiavik, purchase (400095)
    r. Type G, Utkiavik, purchase (400095)
    s. Type G, Utkiavik, purchase (400095)
    t. Type E′, timbers below Structure C, Mound A, Birnirk (401659)
    u. Type E′, floor of House A, Mound A, Birnirk (399233A)
    v. Type E′, below floor of Structure E, Mound A, Birnirk (399503)
    w. Type F′, below house floor, Mound B, Birnirk (398892)
    x. Type F′, floor deposit, House A, Mound B, Birnirk (398870)
    y. Type G′, below floor of House B, Mound A, Birnirk (398953)
    z. Type G′, floor deposit, Structure C, Mound A, Birnirk (399033)
    a′. Type G′, Structure 2, Mound A, Birnirk (401674)
    b′. Type H, floor of House A, Mound A, Birnirk (399195)
    c′. Type H, timbers below Structure C, Mound A, Birnirk (401659)
    d′. Type H, Cut 4, entrance to House A, over Structure C, Mound A, Birnirk (399019A)
    e′. Type I, Cut 1, floor of House A, Mound J, Birnirk (399571)
    f′. Type I, floor of House A, Mound A, Birnirk (399195)
    g′. Type I, Structure H, Mound A, Birnirk (399420)
    h′. Type J, Cut 3, Section 6, Mound A, Birnirk (399375)
    i′. Type J, floor of House A, Mound A, Birnirk (399195)
    j′. Type J, floor of Structure G, Mound A, Birnirk (399524)
    k′. Type K, floor deposit of House A, Mound B, Birnirk (398848)
    l′. Type K, Structure H, Mound A, Birnirk (399420)
    m′. Type L, floor of House A, Mound A, Birnirk (399233)
    n′. Type L, below floor of Structure B, Mound A, Birnirk (398953)
    o′. Type L, floor deposit of House A, Mound B, Birnirk (398848)
    p′. Type M, floor of Structure E, Mound A, Birnirk (399488)
67. Snow-handling equipment from Nuwuk and Utkiavik
    a. House B, Utkiavik (400325)
    b. Nuwuk, purchase (399845)
    c. House B, Utkiavik (400321)
    d. House A, Utkiavik (401844)
68. Snow-handling equipment from Birnirk
    a. Cut 3, Section 4, Mound A (399361)
    b. Cut 2, Section 4, Mound A (399275)
    c. Roof of House A, Mound A (399203)
    d. Roof of House A, Mound A, Birnirk (399161)
69. Baleen ring for walking stick from floor of Structure D, Mound A, Birnirk (399105)
70. Snow goggles from Birnirk
    a. Floor of House A, Mound C (398830)
    b. House A, Mound A (416799)
    c. Structure C, Mound A, Birnirk (399495)
71. Fishing gear from Nuwuk and Utkiavik
    a. Above House A, Utkiavik (400680)
    b. House B, Utkiavik (400283)
    c. Utkiavik, purchase (400138)
    d. Utkiavik, purchase (399955)
    e. Utkiavik, purchase (399955)
    f. Nuwuk, purchase (399858)
    g. Utkiavik, purchase (400140)
    h. House B, Utkiavik (400302)
    i. Utkiavik, purchase (400136)
    j. Utkiavik, purchase (400136)
    k. Utkiavik, purchase (400137)
    l. Utkiavik, purchase (400240)
    m. Utkiavik, purchase (400136)
    n. Utkiavik, purchase (400167)
    o. Nuwuk, purchase (399815)
    p. House B, Utkiavik (400300)
    q. Cut 2, Section 1, Utkiavik (400424)
72. Fishing gear from Nunagiak
    a. Cache B, Mound C (401232)

b. Cut 4, Section 4 (401315)
c. Cut 2, Section 6 (401028)

73. Fishing gear from Birnirk
a. Floor deposit of House A, Mound B (398883)
b. Below floor, Structure B, Mound A (398949)
c. Structure B, Mound A (398950)
d. Cut 12, roof timbers, Structure E, Mound A (416763)
e. Floor of House A, Mound J (416764)
f. Cut 3, Section 7, Mound A (399395)

74. Baleen toboggan from Cut 7, Section 5, Mound D, Birnirk (398994)

75. Sled and boat parts from Utkiavik and Nuwuk
a. Cut 2, Section 6, Utkiavik (400507)
b. House B, Utkiavik (400319)
c. Floor of House A, Utkiavik (400596)
d. Nuwuk, purchase (399902)
e. Utkiavik, purchase (400173)
f. Floor of House B, Utkiavik (400332)
g. Cut 2, Section 1, Utkiavik (400448)
h. Nuwuk, purchase (399798)
i. Utkiavik, purchase (400210)
j. Nuwuk, purchase (399910)

76. Sled and boat parts from Nunagiak
a. Entrance D, Mound C (401234)
b. Entrance D, Mound C (401282)

77. Sled parts and equipment from Birnirk
a. Floor of Structure D, Mound A (399109)
b. Cut 1, floor of House A, Mound J (399606)
c. Cut 3, Section 7, Mound A (399382)
d. Entrance to House A, Mound A (399163)
e. Roof, House A, Mound A (399156)

78. Boat parts from Birnirk
a. Surface, Mound D, Eskimo excavation (399001)
b. Below Structure C, Mound A (399081)
c. Below floor of Structure B, Mound A (398930A)
d. Cut 3, Section 4, Mound A (399365)
e. Below Structure C, Mound A (399090)
f. Below Structure F, Mound A (399533)

79. Toy boats made of bark from Birnirk
a. Floor of House A, Mound A (399190)
b. Floor of Structure B, Mound A (398912)
c. Cut 13, Section 2, Mound J (399679)
d. House floor, Mound C (398865)
e. Structure H, Mound A (399452)
f. Floor of House A, Mound A (399184)

80. Antler strips, probably kayak ribs, from entrance, House A floor, Mound A, Birnirk (399173)

81. Men's knife handles and blades from Nuwuk and Utkiavik
a. Utkiavik, purchase (399981)
b. Utkiavik, purchase (400220)
c. Nuwuk, purchase (399904)
d. Over House A, Utkiavik (400744)
e. Cut 2, Section 6, Utkiavik (400514)
f. Nuwuk, purchase (399899)
g. Nuwuk, purchase (399830)
h. Utkiavik, purchase (400130)
i. Utkiavik, purchase (400064)
j. House B, Utkiavik, purchase (400288)
k. Nuwuk, purchase (399901)
l. Cut 2, Section 1, Utkiavik (400407)
m. Nuwuk, purchase (399901)
n. Floor of House A, Utkiavik (400588)
o. Floor of House A, Utkiavik (400628)
p. Over entrance, House A, Utkiavik (401844)
q. Over House A, Utkiavik (400784)

82. Men's knife handles and blades from Nunagiak
a. Cut 2, Section 6 (401030)
b. Cut 2, Section 2, (401413)
c. Entrance D, Mound C (401260)
d. Entrance D, Mound C (401186)
e. Cut 4, Section 3 (401334)
f. Cut 1, Section 1 (401374)
g. Cut 4, Section 3 (401341)
h. Cut 2, Section 4 (400998)
i. Cut 2, Section 6 (401031)
j. Beach, below Mound C (400919)
k. Cut 4, Section 4 (401818)
l. Punuk house (400887)
m. Cut 2, Section 4 (400988)
n. Cut 2, Section 4 (400988)
o. Punuk house (400968)

83. Men's knife handles, blades, and a sharpening stone from Birnirk
a. Cut 3, Section 7, Mound A (399391)
b. Cut 13, Section 1, Mound J (399696)
c. Cut 13, Section 1, Mound J (399692)
d. Structure E, Mound A (399484)
e. Floor of House A, Mound A (399233)
f. Roof, House A, Mound A (399148)
g. Cut 4, over Structure C, Mound A (399018)
h. Cut 4, floor of Structure C, Mound A (399024)
i. Cut 2, Section 2, Mound A (399265)
j. Structure E, Mound A (401600)
k. Structure H, Mound A (399437)
l. Structure H, Mound A (399457)
m. Structure E, Mound A (401600)
n. Structure E, Mound A (401600)
o. Roof of House A, Mound A (399152)

84. Drill and adze parts from Nuwuk and Utkiavik
a. Over entrance, House A, Utkiavik (400575)
b. Floor, House A, Utkiavik (400524)
c. Utkiavik, purchase (400057)
d. Utkiavik, purchase (400142)
e. Over House A, Utkiavik (400694)
f. Over House A, Utkiavik (400670)
g. Utkiavik, purchase (400148)
h. Floor, House A, Utkiavik (400549)
i. Utkiavik, purchase (400017)
j. Over House A, Utkiavik (400770)

k. Nuwuk, purchase (399844)
l. Cut 2, Section 6, Utkiavik (400509)
m. Over House A, Utkiavik (400702)
n. House B, Utkiavik (400328)
o. Over House A, Utkiavik (400568)
p. Nuwuk, purchase (399812)

85. Drill and adze parts from Birnirk
a. Floor entrance, House A, Mound A (399167)
b. Floor of House A, Mound A (399188)
c. Floor of House A, Mound A (399244)
d. Structure B, Mound A (398938)
e. Cut 3, Section 7, Mound A (399388)
f. Below floor of House A, Mound A (399192)
g. Cut 3, Section 7, Mound A (399383)
h. House 2, Mound A (399496)
i. Below floor of Structure C, Mound A (399084)
j. Structure H, Mound A (399442)
k. House 2, Mound A (399653)
l. Roof, House A, Mound A (399147)
m. Cut 3, Section 7, Mound A (399390)

86. Complete adze from entrance to House A, Mound A, Birnirk (399178)

87. Picks and mattocks from Nuwuk, Utkiavik, and Nunagiak
a. Cut 2, Section 6, Utkiavik (400508)
b. House B, Utkiavik (400313)
c. Nuwuk, purchase (399841)
d. Over House A, Utkiavik (400720)
e. Nuwuk, purchase (399926)
f. Cut 4, Section 2, Nunagiak (401321)
g. Entrance D, Mound C, Nunagiak (401185)

88. Mattocks and bone wedges from Birnirk
a. Structure B, Mound A (416756)
b. Roof of House A, Mound A (399145)
c. Below Structure C, Mound A (399100)
d. Floor 2, House A, Mound J (399648)
e. Cut 12, Mound A (399302)

89. Blubber hooks from Nuwuk and Utkiavik
a. Cut 4, Section 2, Utkiavik (400363)
b. Nuwuk, purchase (399806)

90. Women's knives and scrapers from Nuwuk and Utkiavik
a. Utkiavik, purchase (400156)
b. Utkiavik, purchase (400033)
c. Nuwuk, purchase (399801)
d. House B, Utkiavik (400289)
e. Cut 4, Section 2, Utkiavik (400359)
f. Utkiavik, purchase (399977)
g. Utkiavik, purchase (400156)
h. Utkiavik, purchase (400186)
i. Utkiavik, purchase (416783)
j. Utkiavik, purchase (400186)
k. Above House A, Utkiavik (400715)
l. Utkiavik, purchase (400190)
m. Utkiavik, purchase (400190)
n. Location X, Utkiavik (400379)
o. Utkiavik, purchase (400152)
p. Utkiavik, purchase (400002)
q. Utkiavik, purchase (400054)
r. House B, Utkiavik (400291)
s. Over entrance of House A, Utkiavik (416733)
t. Over House A, Utkiavik (400669)

91. Women's knives and scrapers from Nunagiak
a. Cache A, Mound C (401164)
b. Cut 2, Section 4, Mound A (400984)
c. Miscellaneous from beach, Mound C (400919)
d. Cut 2, Section 6 (401031)
e. Cut 4, Section 1 (401300)
f. Cut 2, Section 6 (401031)
g. Cut 2, Section 6 (401031)
h. Cut 2, Section 5 (401013)
i. Entrance D, Mound C (401284)

92. Women's knives and scrapers from Birnirk
a. Cut 3, Section 7, Mound A (399392)
b. Below floor of House A, Mound B (398894)
c. Below floor of Structure B, Mound A (398947)
d. Cut 7, Section 7, Mound B (398997)
e. Structure H, Mound A (399424)
f. Cut 6, Section 2, Mound A (398973)
g. Cut 2, Section 1, Mound A (399258)
h. Below floor of House A, Mound B (398894)
i. Floor of House A, Mound B (398879)
j. Below floor of House A, Mound B (398893)
k. Floor of House A, Mound B (398845)
l. Below floor of Structure B, Mound A (398942)
m. Structure E, Mound A (401600)
n. Floor of House A, Mound B (398861)
o. Cut 3, Section 1, Mound A (399331)
p. Entrance to House A, Mound A (399177)
q. Cut 12, Section 1, Mound A (399311)

93. Household containers from Nuwuk and Utkiavik
a. Utkiavik, purchase (400159)
b. Nuwuk, purchase (399913)
c. Utkiavik, purchase (400082)
d. Utkiavik, purchase (400038)
e. Utkiavik, purchase (399997)
f. Utkiavik, purchase (400001)
g. Cut 2, Section 3, Utkiavik (400485)
h. Cut 2, Section 1, Utkiavik (400431)
i. Below floor of House A, Utkiavik (400607)
j. House B, Utkiavik (400330)
k. Cut 2, Section 1, Utkiavik (400432)

94. Containers and tools from Nunagiak
a. Entrance D, Mound C (401279)
b. Cut 2, Section 4 (400995)
c. Entrance D, Mound C (401238)
d. Entrance D, Mound C (401288)
e. Structure E, Mound C (401202)

95. Containers from Birnirk
a. Floor, Mound B (398877)

b. Northeast corner, Cut 4, level of seal bones, Structure C, Mound A (399031)
c. Floor of Structure B, below Mound A (398928)
d. Floor of Structure D, Mound A (399107)
e. Floor of House A, Mound A (399226)

96. Pottery vessel from Location X, Utkiavik (400348)
97. Pottery fragments and a lamp fragment from Nunagiak
a. Cut 1, Section 1 (401378)
a'. Cut 1, Section 1 (401378)
b. Cut 1, Section 5 (401347)
c. Cut 1, Section 1 (401378)
d. Cut 5, Section 1 (401131)
e. Cut 6, Section 2 (401041)
f. Entrance D, Mound C (401289)
98. Pottery and lamp fragments from Birnirk
a. Cut 9, Section 4, Mound H (416794)
b. Cut 3, Section 1, Mound A (399326)
c. Cut 3, Section 1, Mound A (399326)
d. Cut 2, Section 1, Mound A (399253)
e. Cut 13, Section 1, Mound J (399705)
f. Structure F, Mound A (399529)
g. Cut 3, Section 1, Mound A (399326)
h. Cut 1, southwest corner of House A, Mound J (399649)
99. Pottery paddle made of whale bone, from roof of House A, Mound A, Birnirk (399143)
100. Combs and sewing gear from Nuwuk and Utkiavik
a. Above House A, Utkiavik (400718)
b. Nuwuk, purchased (399800)
c. House B, Utkiavik (400301)
d. Above House A, Utkiavik (400773)
e. House B, Utkiavik (400301)
f. Utkiavik, purchase (400101)
g. Location X, Utkiavik (400387)
h. Cut 2, Section 1, Utkiavik (400411)
i. Utkiavik, purchase (400041)
j. Cut 4, Section 2, Utkiavik (400350)
k. Nuwuk, purchase (399857)
l. Floor of House A, Utkiavik (400630)
m. Nuwuk, purchase (399824)
n. Utkiavik, purchase (400103)
o. Utkiavik, purchase (400011)
p. Utkiavik, purchase (400103)
101. Toggles, dolls, and combs from Nuwuk and Utkiavik
a. Nuwuk, purchase (399855)
b. Utkiavik, purchase (416793)
c. Utkiavik, purchase (400013)
d. Nuwuk, purchase (399824)
e. Utkiavik, purchase (399946)
f. Utkiavik, purchase (399946)
g. Nuwuk, purchase (399857)
h. Above House A, Utkiavik (400666)
i. Utkiavik, purchase (399951)
j. Nuwuk, purchase (399868)
k. Utkiavik, purchase (400084)
l. Utkiavik, purchase (40800)
m. Above House A, Utkiavik (400662)
n. Nuwuk, purchase (399853)
o. Nuwuk, purchase (399853)
p. Floor of House A, Utkiavik (400518)
102. Combs and needle cases from Nunagiak
a. Cut 2, Section 2 (401421)
b. Cut 4, Section 1 (401297)
c. Cut 1, House G (401360)
d. Entrance D, Mound C (416798)
e. Cut 1, House B (401372)
f. Cut 1, House B (401372)
g. Cut 1, House B (401370)
h. Cut 1, Section 1 (401376)
i. Cut 4, Mound C (400953)
j. Cut 4, Section 2 (401329)
103. Awls, needle cases, and ornaments
a. Floor of House A, Mound A, Birnirk (399197)
b. Floor of House A, Mound A, Birnirk (399243)
c. Below Structure C, Mound A, Birnirk (399047)
c'. Below Structure C, Mound A, Birnirk (399047)
d. Floor of House A, Mound J, Birnirk (401657)
e. Cut 11, Section 1, Burial 1, Mound R, Birnirk (401653)
e'. Cut 11, Section 1, Burial 1, Mound R, Birnirk (401653)
f. Miscellaneous, Barrow, purchase (401658)
g. Roof of House A, Mound A, Birnirk (416790)
h. Floor of Structure H, Mound A, Birnirk (399461)
i. Cut 1, Floor 2, Mound J, Birnirk (399639)
j. Floor deposit, Mound C, Birnirk (398854)
k. Below floor of Structure B, Mound A, Birnirk (398961)
104. Ornaments and problematical objects from Birnirk and Nuvuwaruk
a. Cut 5, floor of House B, Mound A, Birnirk (398917)
b. Cut 1, below floor of House A, Mound J, Birnirk (401654)
c. Floor of entrance, House A, Mound A, Birnirk (399134)
d. Cut 2, Section 4, Mound A, Birnirk (399291)
e. Outside back wall of House A, Mound A, Birnirk (401655)
f. Cut 4, above timbers, Mound A, Birnirk (416791)
g. House H, Mound A, Birnirk (399455)
h. Roof timbers, House A, Mound C, Birnirk (416792)

i. Cut 13, Section 3, Mound J, Birnirk (399709)
j. Cut 13, Section 2, Mound J, Birnirk (399666)
k. Cut 13, Section 2, Mound J, Birnirk (399666)
l. House A, Mound R, Birnirk (416797)
m. Cut 3, Section 1, Mound A, Birnirk (399323)
n. Cut 3, Section 3, Nuvuwaruk (401488)
o. Cut 1, Section 3, Nuvuwaruk (400488)

105. Small items from Birnirk
a. Southeast corner of House A, Mound A, Birnirk (416788)
b. Floor of House H, Birnirk (399427)
c. Cut 3, Section 3, Mound A, Birnirk (399347)
d. Structure E, Mound A, Birnirk (416789)
e. Floor of House A, Mound C, Birnirk (398841)
f. Below House C, Mound A, Birnirk (399051)
g. Entrance to House A, Mound A, Birnirk (399179)
h. Below House C, Mound A, Birnirk (399049)
i. House E, Mound A, Birnirk (416787)
j. Floor of House A, Mound J, Birnirk (416785)
k. House floor, Mound B, Birnirk (398862)
l. Cut 3, Section 7, Mound A, Birnirk (399408)
m. Cut 2, Section 2, Mound A, Birnirk (399263)
n. Cut 3, Section 1, Mound A, Birnirk (399319)
o. Cut 3, Section 2, Mound A, Birnirk (399334)
p. Cut 7, Section 5, Mound J, Birnirk (416784)
q. Floor of House A, Mound A, Birnirk (416786)
r. Cut 3, Section 2, Mound A, Birnirk (399344)
s. Barrow vicinity, Morgan Collection (not catalogued)

106. Clothing from Birnirk
a. Floor of House D, Mound A (399103)
a′. Floor of House D, Mound A (399103)
b. Entrance, House A, Mound A, (401629)
b′. Entrance, House A, Mound A (401629)
c. Miscellaneous, Mound O (399727)
d. Miscellaneous, Mound O (399727)
e. Floor of House A, Mound C (398888)

107. Baleen rack used to hang above the lamp for drying clothing, Cut 7, Section 5, Mound D, Birnirk (398993)

108. Labrets from Utkiavik
a. Purchase (400100)
b. Cut 2, Section 1, Mound B (400414)
c. Purchase (400100)
d. Purchase (400100)
e. Purchase (399976)

109. Wooden drum rim and handle from entrance to House A, Mound A, Birnirk (399202)

110. Dolls from Birnirk and Nunagiak
a. Floor of House A, Mound A, Birnirk (399150)
b. Floor of House B, Mound A, Birnirk (398909)
c. Cut 3, Section 4, Mound A, Birnirk (399356)
d. Below House C, Mound A, Birnirk (399085)
e. Parallel timbers between Houses A, E, C, Birnirk (399124)
f. Floor of House A, Mound A, Birnirk (399151)
g. Cut 13, Section 1, Mound J, Birnirk (416796)
h. Entrance D, Mound C, Nunagiak (401266)
i. Floor 2, House A, Mound A, Birnirk (399238)

111. Objects from Nuwuk and Utkiavik
a. Location X, Utkiavik (416802)
b. Utkiavik, purchase (400072)
c. Utkiavik, purchase (400180)
d. Nuwuk, purchase (399838)
e. Cut 2, Section 1, Utkiavik (400756)
f. Nuwuk, purchase (399848)
g. House B, Utkiavik, purchase (400297)
h. Cut 2, Section 5, Utkiavik (400498)
i. Utkiavik, purchase (400166)
j. Nuwuk, purchase (400281)

112. Objects from Birnirk
a. Cut 3, Section 4, Mound A (416800)
b. Cut 3, Section 4, Mound A (399362)
c. Cut 3, Section 7, Mound A (399396)
d. Entrance to House A, Mound A (399172)
e. Floor, Structure C, Mound A (416801)
f. Cut 3, Section 7, Mound A (399376)
g. Floor, Mound R (399565)
h. Cut 2, Section 2, Mound A (399264)
i. Cut 2, Section 5, Mound A (399293)
j. Floor 2, House A, Mound J (399624)
k. Structure H, Mound A (399432)

INDEX

adzes, 178
Ahteut Site, 104, 116, 133, 168, 204, 218, 243
Alilu Closed Socket harpoon head, 52, 86, 87, 238, 243
Ambler Island, 104, 173, 227
Anangiarsuk, 105
antler strips, possibly kayak ribs, 158
archeological field-work prior to 1930, 17
archeological sites near Point Barrow, 18
arrowpoint blanks, 124; comparisons, 132
arrowpoints, 123; blunt, for birds, 124; knobbed tang, with end slots for stone blades, 128; knobbed tang, with unilateral barbs, 128; long serrated barbed, with spurred or knobbed tangs, 126; socketed, with single barbs, 124; spurred tang, with barbs and notched points, 126; spurred tang, with barbs and stone points, 126; spurred tang, with multiple unilateral barbs, 126; spurred tang, with single barbs, 126; spurred tang, without barbs, 124; tapering tang, with opposing barbs, 132; tapering tang, with single barbs, 132; tapering tang, with unilateral multiple barbs, 128; tapering tang, without barbs, 132; unclassified, 132
arrowshaft wrench, 138
arrowshafts, 122
Atanik, 15, 18
atlatl equipment, 112
artifacts, 75

baleen objects, miscellaneous, 229
baleen shaves, 181
baleen toboggans, 151
Banks Island, 122
Barrow, Point
See Point Barrow
Barrow Closed Socket harpoon head, 73, 86, 92, 94, 96, 237, 244
Barrow Village, 15, 17, 19, 55, 56
Barter Island, 13, 17, 18, 36, 89, 141, 181
Beaufort Sea, 17, 18, 36
beamers, 194
Bering Strait Region, 63, 75, 86, 96, 102, 104–106, 108, 116, 118, 138, 143, 150, 174, 179, 181, 183, 184, 186, 192, 205, 212, 215, 218, 229, 231, 232, 235, 237, 241–244
bird dart points and side prongs, 116
Birnirk Culture, 242; derivation, 238
Birnirk Open Socket harpoon head, 30, 37, 39–44, 49–51, 53, 55, 75, 80, 83, 87, 94, 96, 233, 242
Birnirk Period, 18, 21, 31, 32, 40–45, 47, 49, 51, 120, 128, 132, 134, 245
Birnirk Site, 15, 16, 18, 21, 25, 31, 33, 35, 56, 75, 94, 96, 97, 100, 102, 104–108, 112, 113, 117, 119, 120, 123, 128, 132, 137, 138, 141–143, 145–147, 149, 151, 152, 154, 156–158, 160, 161, 165–168, 170–174, 178–181, 183, 185, 186, 189, 190, 193, 195, 196, 198, 201, 202, 204, 205, 207, 212, 214, 215, 218, 220–223, 227, 229, 230, 233–235, 238, 241, 243, 245, 251; Cut 12, 44; excavations, 36; Mound A, 36, 39, 40; Mound A, House A, 39, 40; Mound B, 35; Mound C, Cut 14, 48; Mound D, 35; Mound D, Cut 7, 49; Mound G, Cut 8, 50; Mound H, Cut 9, 50; Mound J, Cuts 1 and 13, 51; Mound R, 35; Mound R, Cut 11 and included burials, 35, 54; Mound S, 35; Mound S, Cut 6, 55; mounds, 33; Structure B, Cut 5, 42; Structure C, 43; Structure D, 44; Structure E and included burials, 45; Structure F, 46; Structure G, 47; Structure H, 47
bladder darts, 114
blubber hooks, 184
bolas balls, 138–142
bone awls, 211; crushers, 207
bowdrills, 173
bows and arrows, 118
Brooks Range, 17, 114
Brower, Charles D., 13, 18, 19, 56, 67, 73
Brower Closed Socket harpoon heads, 68, 69, 86, 90, 96, 233
buckets of wood and baleen, 205
Burial 1, Kugok, 25
Burial 1, Nunagiak, 60
Burial Mound A, Kugok, 25
Burial Mound B, Kugok, 28
Burial Mounds C–F, Kugok, 30
butt pieces, 113
"butterfly" object, 215

Cape Baranov, 76, 80
Cape Beaufort, 17
Cape Chaplin, 82, 141
Cape Dezhnev, 82, 90
Cape Dorset Culture, 231
Cape Lisburne, 17
Cape Nome, 207
Cape Smythe Closed Socket harpoon head, 70, 71, 77, 89, 90, 94, 236, 238, 242, 244
Carter, Wilbert, 15, 18, 27, 31, 51
Chipp River, 17
chipped flint points, 135
Chukchi Peninsula, 64, 233
clothing, 215, 218; drying rack for, 221
Collins, Henry B., Jr., 13
Colville River, 17, 18
combs, 208
composite handles, 161
conclusions, 231
cooking vessels, 198
Coronation Gulf, 198
cup-shaped fat scrapers, 194
Cut 1, House A, Utkiavik, 67
Cut 1, Nunagiak, 58
Cut 1, Nuvuwaruk, 56

Cut 2, Nunagiak, 59
Cut 2, Nuvuwaruk, 56
Cut 2, Utkiavik, 70
Cut 3, Nunagiak, 60
Cut 3, Nuvuwaruk, 56
Cut 3, Utkiavik, 71
Cut 4, Utkiavik, 70
Cut 5, Nunagiak, 66
Cut 12, Birnirk, 44

dart points, 114; shafts, 113
Demarcation Point, 17
detachable lance points, 105
Dorset Culture, 166, 171
drag line handles, 109
drum parts, 222
drums, 222
drying rack for clothing, 221

East Cape, 82, 166
Ekseavik Site, 82, 86, 92, 100, 102, 104, 116, 138, 147, 168, 173, 186, 190, 204, 208, 214, 243
Elson Lagoon, 17, 18, 33, 35, 138
Endicott Mountains, 35
engraving tools, 171
E-set-quok (Nuvuwaruk), 55

feather cutting board, 138
Find 1, Nunagiak, 61
finger rests for harpoon shaft, 102
firemaking equipment, 175
fish scaler, 195
fishhooks, 150
fishing equipment, 147
flint flakers, 172; sidescrapers, 192
float bars, 104
foreshafts, 97

Gambell, 82, 93, 106, 132, 149, 158, 166, 173, 174, 231, 232, 236
Griest, Henry B., 13
gull hooks or gorges, 150

harpoon blades, 96
harpoon head chronologies, comparison, 231
harpoon heads, 75; analysis of, 93; closed socket, 236; from Kugusugaruk, 21; lines of development, 232; open socket, with blade slit in same plane as line hole, 234; with blade slit at right angles to line hole, 235; with side blades in plane of line hole, 234; with stone side blades or barbs at right angles to line hole, 233
harpoon parts, 75
harpoon shafts, 100; finger rests, 102; ice picks, 102; methods of splicing and reënforcing, 100
harpoon socket pieces, 99
Harrison Bay, 17
Hillside Site, 112, 137, 174, 189, 234, 236, 237, 244
Hopson, Alfred H., 13, 15, 18, 19, 25, 31; work at Nunavak, 21
House A, Mound A, Birnirk, 39, 40
House B, Utkiavik, 72
household equipment, 186
human skeletal material, 245

ice picks for harpoon shaft, 102
ice scoops, 106; two-piece, 108
ice staff rings, 145
Ievoghiyok Site, 63, 82, 87, 114, 158, 233–235, 237, 243
Iglulik Site, 233, 235
Inaru River, 17
inflation nozzles, 114
Ipiutak Site, 31, 80, 90, 133, 135, 138, 145, 147, 149, 150, 158, 161, 166, 171–174, 178, 183, 186, 190, 194–196, 204, 207, 208, 222, 231–234, 236–238, 240, 244
Ipiutak Type 1 harpoon head, 79

Jones Islands, 18

Katoktok Open Socket harpoon head, 80, 96, 234
Kavran Site, 156
kayaks, 156
Kilimatavik, 15, 18
Kilimatavik Closed Socket harpoon head, 69, 73, 86, 89, 90, 92, 93, 96, 233, 237, 242, 244
knives, crooked, 160; for squeezing out water, 111; men's, 160; side-blade, 160
Kobuk River, 17, 87, 94, 111, 116, 132, 137, 138, 145, 149, 150, 156, 161, 168, 173, 174, 178, 179, 186, 195, 204, 207, 208, 214, 218, 222, 231, 238, 243, 244
Kotzebue sites, 89, 92, 100, 104, 111, 116, 134, 138, 145, 156, 173, 190, 218, 227, 243, 244
Kugok, 15, 24, 25, 32, 36, 77, 123, 128, 137, 172, 205, 218, 245; Burial Mound A, 25; Burial Mound A, Burial 1, 25; Burial 2, 25; Burial 3, 25; Burial 4, 25; Burial 5, 25; Burial 6, 25; Burial 7, 27; Burial Mound B, 28; Burial Mound B, Burial 1, 28; Burial 2, 28; Burial 3, 28; Burial 4, 28; Burial 5, 50; Burial 6, 30; Burial 7, 30; Burial 8, 30; Burial Mounds C–F, 30; comparison of Mounds A and B, 30; cultural content of burial mounds, 31; physiography of burial sites, 32
Kugok ravine, 18, 67, 70
Kugrua River, 17
Kugusugaruk, 19, 24, 31, 32, 36, 94, 106, 109, 112, 120, 233–235, 245, 246
Kuk Closed Socket harpoon head, 73, 90, 96, 234, 237
Kuk River, 17, 36
Kuk Site, 83, 88, 89, 147, 149, 238
Kukulik, 18, 77, 80, 87, 112, 142, 156, 158, 223

labrets, 221
ladles, 196
Lady Franklin Bay, 86
lamps, 198

lance and lance points, 104
lancet, 215
landscape, 17
Langton Bay, 90
leisters, 147
Location X, Utkiavik, 71

Malerualik, 87
man's knife handles with blade slot in end, 166
Mathiassen, Therkel, 13 ff.
mattocks, 181
Meade River, 17
meat forks, 207
Melville Peninsula, 233
men's knives, 160; tools, 160
Mitimatalik, 111, 114, 232, 233, 238
Mitliktavik, 15, 18
Miyowagh, 63, 64, 77, 80, 82, 97, 102, 105, 112, 114, 117, 118, 147, 150, 158, 174, 189, 196, 208, 214, 215, 221, 223, 229, 230, 233–237
Morgan, Stanley, 13
Mound A, Birnirk, 36, 39, 40
Mound A, Nunagiak, 58
Mound B, Nunagiak, 59
Mound C, Cut 14, Birnirk, 48
Mound C, Nunagiak, 60, 61
Mound D, Birnirk, 35
Mound D, Cut 7, Birnirk, 49
Mound D, Nunagiak, 60
Mound G, Cut 8, Birnirk, 50
Mound H, Cut 6, Nunagiak, 66
Mound H, Cut 9, Birnirk, 50
Mound J, Cuts 1 and 13, Birnirk, 51
Mound R, Cut 11 and included burials, Birnirk, 35, 54
Mound S, Birnirk, 35; Cut 6, 55
Murdoch, John, 33 ff.

Natchuk Open Socket harpoon head, 37, 42–45, 47, 51, 52, 64, 66, 67, 83, 86, 87, 96, 233, 234, 241
Naujan, 87, 89, 97, 105, 114, 122, 135, 143, 145, 151, 168, 171, 173, 190, 232, 233, 238, 241
Naukan, 82, 87
Naulock Open Socket harpoon head, 25, 30, 37, 41, 45–47, 49–52, 79, 82, 96, 233, 235, 240
Nixeruk, 18, 35, 245, 255
needle case pulls, 211
needle cases, 211
net floats, 109; gauges, 109; shuttles, 109; weights, 109
Noatak River, 17
Nunagiak, 15, 16, 18, 56, 63, 64, 75, 96, 97, 99, 100, 102, 104–106, 108, 109, 112–114, 116–120, 123, 124, 128, 137, 138, 145–147, 151, 152, 157, 158, 160, 161, 165, 167, 168, 171–174, 178, 181, 185, 186, 190, 192–194, 196, 198, 202, 205, 207, 208, 214, 215, 218, 220, 222, 223, 227, 233, 235, 238, 241, 243, 244; artifacts from structures below Mound C, 61; Burial 1, 60; Cut 1, 58; Cut 2, 59; Cut 3, 60; Cut 5, 66; date of houses below Mound C, 66; Find 1, 61; Mound A, 58; Mound B, 59; Mound C, 60; Mound D, 60; Mound H, Cut 6, 66; subsidence, 58
Nunagiak Closed Socket harpoon head, 59, 73, 87, 92, 96, 233, 238, 242
Nunavak, 15, 18, 19, 21, 24, 25, 30, 32, 36, 147, 246
Nuvuwaruk, 18, 55, 173; Cut 1, 56; Cut 2, 56; Cut 3, 56
Nuwuk, 15, 18, 73, 92, 96, 97, 102, 104, 106, 108, 109, 115, 116, 118, 119, 122, 124, 132, 134, 137, 142, 143, 145, 150, 151, 157, 160, 165–168, 171, 173, 174, 178, 181, 186, 189, 190, 193, 194, 198, 199, 205, 208, 212, 215, 221, 222, 227, 241–244
Nuwuk Closed Socket harpoon head, 58, 69, 73, 93, 94, 96, 237

Ok-kok-suk, 67
Okvik, 90, 100, 117, 118, 122, 146, 147, 149–151, 156, 158, 166, 172–174, 178, 179, 183, 189, 194, 195, 205, 214, 215, 218, 223, 229, 231–234, 236–238, 240–242, 244
Old Bering Sea, 27, 31, 32, 79, 80, 92, 97, 100, 106–108, 112, 114, 117, 132, 135, 137, 145, 150, 151, 156, 158, 161, 166, 168, 172–174, 179, 180, 183, 186, 190, 192, 195, 196, 204, 205, 208, 212, 214, 215, 218, 221, 223, 229, 230, 231, 233–238, 241, 242, 244
"Old Igloo" Site, 19
Oopik Open Socket harpoon head, 47, 77, 79, 80, 234, 240
ornaments, 215
Ovis dalli, 141

Peabody Museum, Harvard University, 15
Peard Bay, 17
perforated polar bear teeth, 218
picks, 181
Piginik, 33
  See Birnirk
Pingasugaruk, 15, 18
pipes, 227
Plover Bay, 146, 154
Plover Islands, 17
Point Atkinson, 87, 90, 207
Point Barrow, 13, 15, 17–19, 33, 35, 36, 40, 56, 61, 64, 66–68, 89, 93, 94, 102, 104, 106, 109, 111, 112, 114–116, 118, 122–124, 126, 132, 133, 137, 138, 142, 143, 145, 146, 149–151, 156, 157, 160, 161, 166, 168, 171, 175, 179–181, 184, 186, 190, 194, 195, 198, 204, 207, 211, 212, 214, 215, 218, 220–222, 229, 231–238, 241–246, 251, 255; subsidence, 34
Point Barrow sequence, relative and calendrical dating, 242
Point Belcher, 56
Point Franklin, 17
Point Hope, 17, 80, 89, 90, 100, 104, 109, 116, 124, 137, 138, 141, 143, 145, 147, 150, 161, 166, 170, 171, 173, 178, 180, 186, 190, 194–196, 202, 204, 207, 208, 231, 236, 237, 240
Point Lay, 17, 36
pottery paddles, 205

Punuk House, Nunagiak, 36, 66, 146, 165, 186
Punuk Island, 64
Punuk Period, 63, 64, 75, 77, 79, 80, 82, 86, 92, 97, 100, 107, 109, 114, 116, 122, 132, 141, 145, 146, 149, 156, 158, 161, 174, 179, 185, 186, 194, 205, 207, 208, 214, 221, 229, 241–244
Punuk style, 60, 61, 63, 66, 75, 79, 92, 114

Qilalukan, 87, 102, 106, 116, 195, 232

Rasmussen, Knud, 13ff.
Ray, Patrick Henry, 18, 33, 50, 55
Resolute, Cornwallis Island, 83

St. Lawrence Island, 13, 63, 64, 75, 77, 79, 80, 82, 86, 87, 93, 96, 97, 100, 104–109, 111, 112, 114, 116–118, 122, 124, 132, 135, 137, 138, 141, 145, 149–151, 156, 158, 161, 166, 171, 173, 174, 178, 185, 186, 189, 192, 194–196, 204, 205, 207, 208, 214, 215, 218, 220, 221, 223, 229, 230–238, 240, 242–244
salmon spears, 147
seal float mouthpieces, 105; plugs, 105
seal killer, 109
seal poke gear, 104
seal rattles, 109
seal scratcher, 109
Seklowaghyaget, 82, 237
Sicco Open Socket harpoon head, 59, 66, 67, 83, 86, 96, 235
Sidaru, 118
Sirhenik Site, 80, 83, 107, 132, 145, 158, 218
sites, 17
slat armor, 221
sleds, 151
snow goggles, 146
snow probe ferrules, 142
snow shovels, 143
snowknives, 143
socket pieces, 114
South Nunavak, 32
"South" Nunavak Lagoon, 32
Southhampton Island, 83, 218
splitting knife handles, 161
spoons, 196
Stefánsson Collection, 19, 31, 33, 93, 245
Stefánsson, Vilhjalmur, 13 ff.; work at Birnirk, 18
Stewart, T. D., 245
Structure B, Cut 5, Birnirk, 42
Structure C, Birnirk, 43
Structure D, Birnirk, 44
Structure E and included burials, Birnirk, 45
Structure F, Birnirk, 46
Structure G, Birnirk, 47
Structure H, Birnirk, 47
subsidence, at Nunagiak, 58; at Point Barrow, 34

Tasik Open Socket harpoon head, 41–45, 47, 75, 79, 82, 83, 86, 96, 235, 241, 243
thimble holders, 211
Thule Type 2 harpoon head, 37, 59, 64, 66–70, 80, 86, 87, 89, 90, 93, 96, 116, 234, 237, 241, 243
Thule Culture, 13, 15, 18, 68, 69, 75, 82, 83, 87, 89, 93, 96, 97, 100, 102, 104–106, 108, 109, 112, 114, 116, 118, 122, 135, 137, 138, 142, 143, 145, 149–151, 156, 158, 161, 166, 171, 174, 175, 178, 180, 181, 183, 186, 190, 192, 194–196, 204, 207, 208, 214, 215, 218, 220, 229–233, 238, 241, 242, 244
thumbnail scrapers and handles, 192
Tigara Period, 83, 89, 171, 190
Tipiruk Open Socket harpoon head, 37, 38, 47, 51, 52, 80, 82, 96, 233, 241
toggles, 215
Topagoruk River, 17
toys, 227
trait comparison summary, 238
transportation, 151
Trendle, John, 13
trinket boxes, 227
Tuquock Open Socket harpoon head, 40, 41, 43, 49, 50, 77, 79, 80, 93, 96, 233, 240

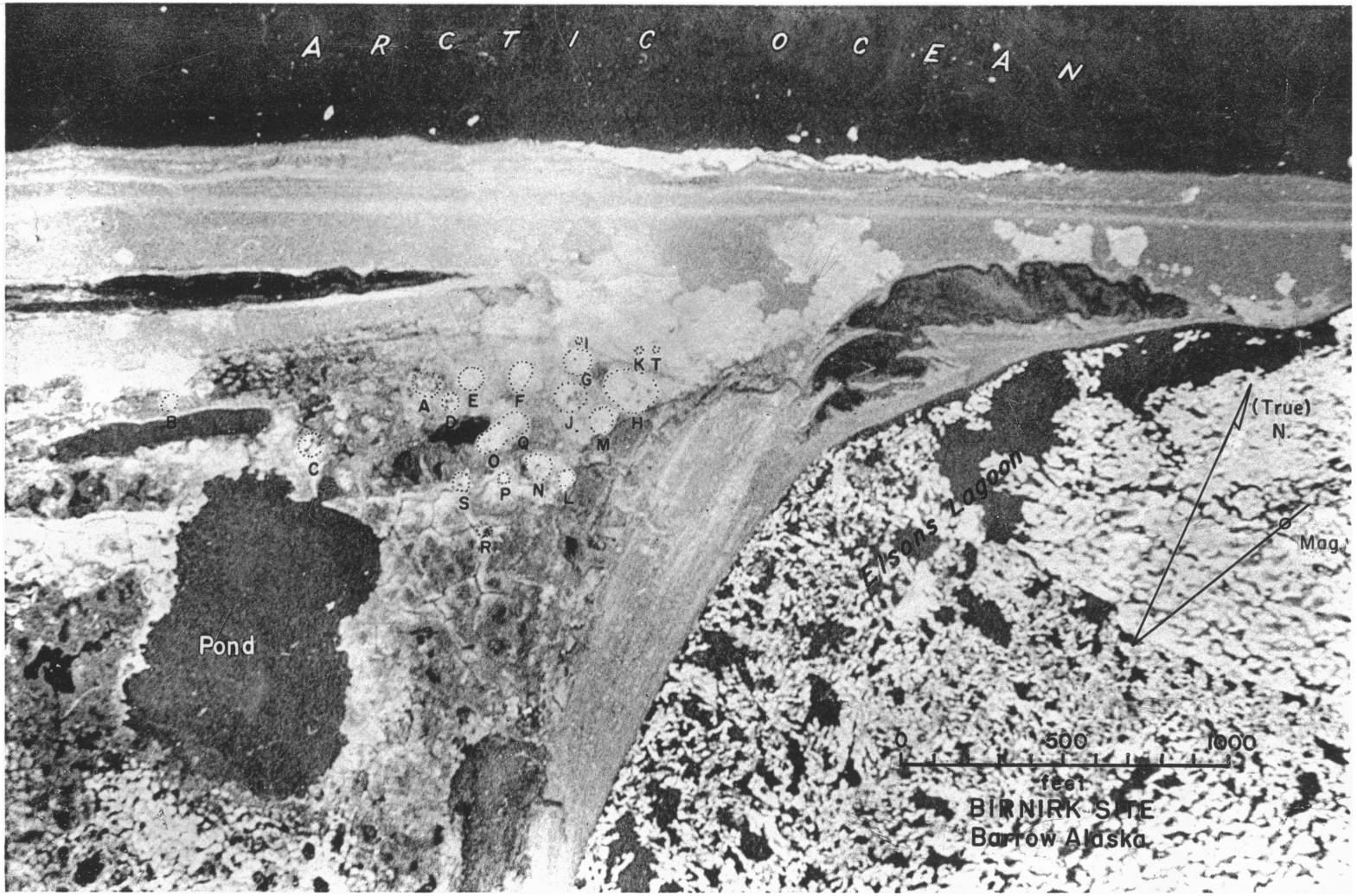
ulus, 186
umiaks, 156
Unalakleet, 31
unidentified objects, 230
United States National Museum, 13, 15, 16; excavations for, 25; human skeletal material, 245, 250
University Museum, Philadelphia, 16, 18, 19, 245
Utkiavik, 15, 17–19, 25, 30–32, 67, 73, 92, 96, 97, 99, 100, 102, 104, 106–109, 111, 112, 114–120, 122, 124, 132, 134, 137, 138, 141–143, 145–147, 149–151, 157, 158, 160, 161, 165–168, 170–175, 178–181, 184, 186, 189, 190, 193, 194, 196, 199, 201, 202, 205, 207, 208, 212, 214, 215, 218, 220, 222, 227, 229, 230, 234, 238, 241–246, 255; Cut 1, House A, 67; Cut 2, 70; Cuts 3 and 4, 71; House B, 72; Location X, 71
Utkiavik Closed Socket harpoon head, 69, 73, 92, 233, 241, 242
Utkusiksaligmiut, 198
Uwelen, 87, 132, 146, 149, 166, 183, 195

Van Valin Collection, 16, 109, 112, 143, 158, 212, 245, 246, 255
Van Valin, W. B., 13, 18, 19, 31, 120, 185, 241, 245; work at Kugusugaruk, 19
Victoria Island, 238

Walakpa, 13, 15, 18
Wainwright, 15, 17
Wainwright Inlet, 36
wedges for splitting wood, 184
whetstones, 172
Wistar Institute, 245
women's tools, 186
wooden dishes, 196; pegs for staking out skins, 195; trays, 196
wound pins, 106; plugs, 106
wrist guards, 137

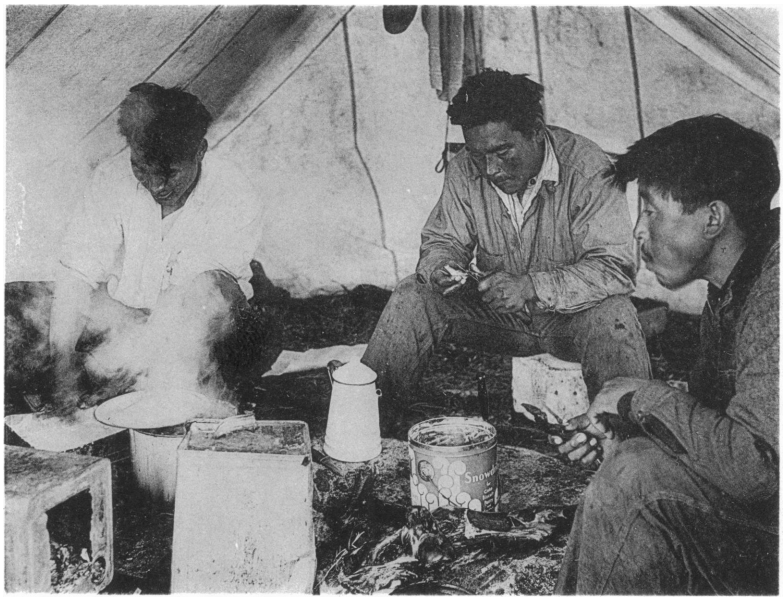
Yukon River, 17

PLATES 1–13



Air photograph of the Birnirk Site. The mounds are outlined by dots. The letters assigned correspond to those on Fig. 11. Elson's Lagoon is filled with loose ice, and there is some drift ice in the ocean on the beach. The large pond south of the site is a thaw feature, but the elongated ponds that lie parallel to the beach occupy depressions between old beach lines. Photograph by the United States Coast and Geodetic Survey, used here by courtesy of the Office of Naval Research

A



B

a. Camp on the beach at the Birnirk Site in 1936

b. Mealtime in archeological camp. The boiled seal ribs are on the tray in the foreground; the "Snowdrift" bucket holds properly aged seal oil

A

B

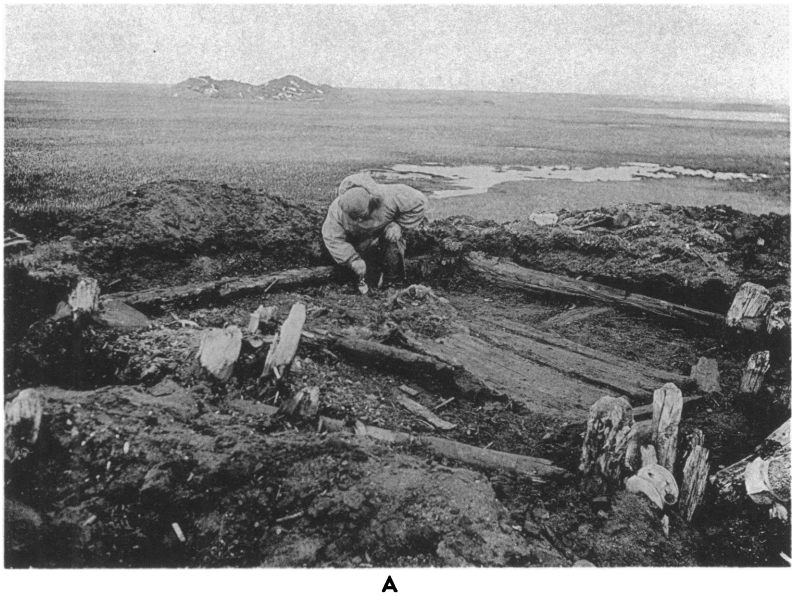
a. Beginning excavation in Mound A, Birnirk Site, in 1932. Cut 4 has exposed the roof timbers of the entrance to House A (see Fig. 13)

b. Excavating House A, Mound A, Birnirk. View is towards the south. Mound C, partially excavated, can be seen in the background

A

B

a. Burials in Structure E, Mound A, Birnirk
b. Baleen toboggan found in Section 5, Cut 6, Mound S, Birnirk



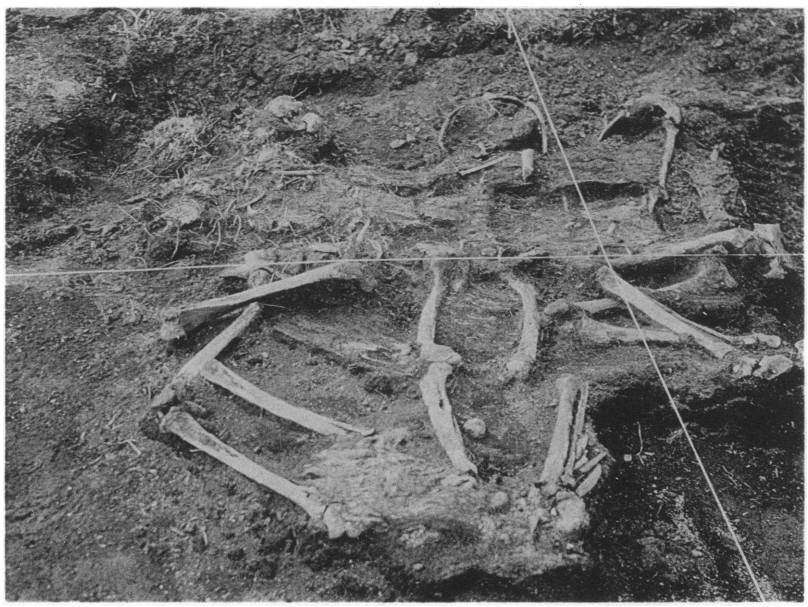
A

B

a. Removing the polar bear skin bedding from the floor of the house in Mound C, Birnirk. Mound A can be seen in the background

b. Entrance tunnel and floor of house in Mound C, Birnirk (see Fig. 16)

A



B

a. Kugok Burial, Mound A. Burial 6 is in the foreground and view is towards the north. The abundant grass roots show how shallow these burials were. Probably they were not intentionally covered with earth (see Fig. 7)

b. Burials 5, 6, and 7 in Kugok Burial Mound B (see Fig. 8)

A

B

a. Work in the structures below Mound C at Nunagiak which yielded artifacts of Punuk art style

b. Excavating Cut 4 in Mound C at Nunagiak. The structures in the beach sand that produced typical Punuk artifacts can be seen in the background

Male skull from Burial Mound A, House E, Birnirk, collected by Ford. Slightly less than one-half natural size

Male skull collected by Van Valin at Kugusugaruk. Slightly less than one-half natural size

Male skull collected by Van Valin at Kugusugaruk. This is the longest skull in the series: length, 208 mm.; cranial index, 62.0. Slightly less than one-half natural size

Female skull collected by Van Valin at Kugusugaruk. Slightly less than one-half natural size

Female skull collected by Van Valin at Kugusugaruk. Slightly less than one-half natural size

Female skull collected by Van Valin at Kugusugaruk. This is the smallest skull in the series: cranial module, 136 mm. Slightly less than one-half natural size

ANTHROPOLOGICAL PAPERS
OF THE
AMERICAN MUSEUM OF NATURAL HISTORY

Volume 47

PART 1. Eskimo Prehistory in the Vicinity of Point Barrow, Alaska. By James A. Ford. Pp. 1–272, 13 plates, 118 text figures, and 28 tables. 1959. Price, $4.75.

PART 2. In preparation.