

THE TABON CAVES

GN  
875  
.P6  
F6

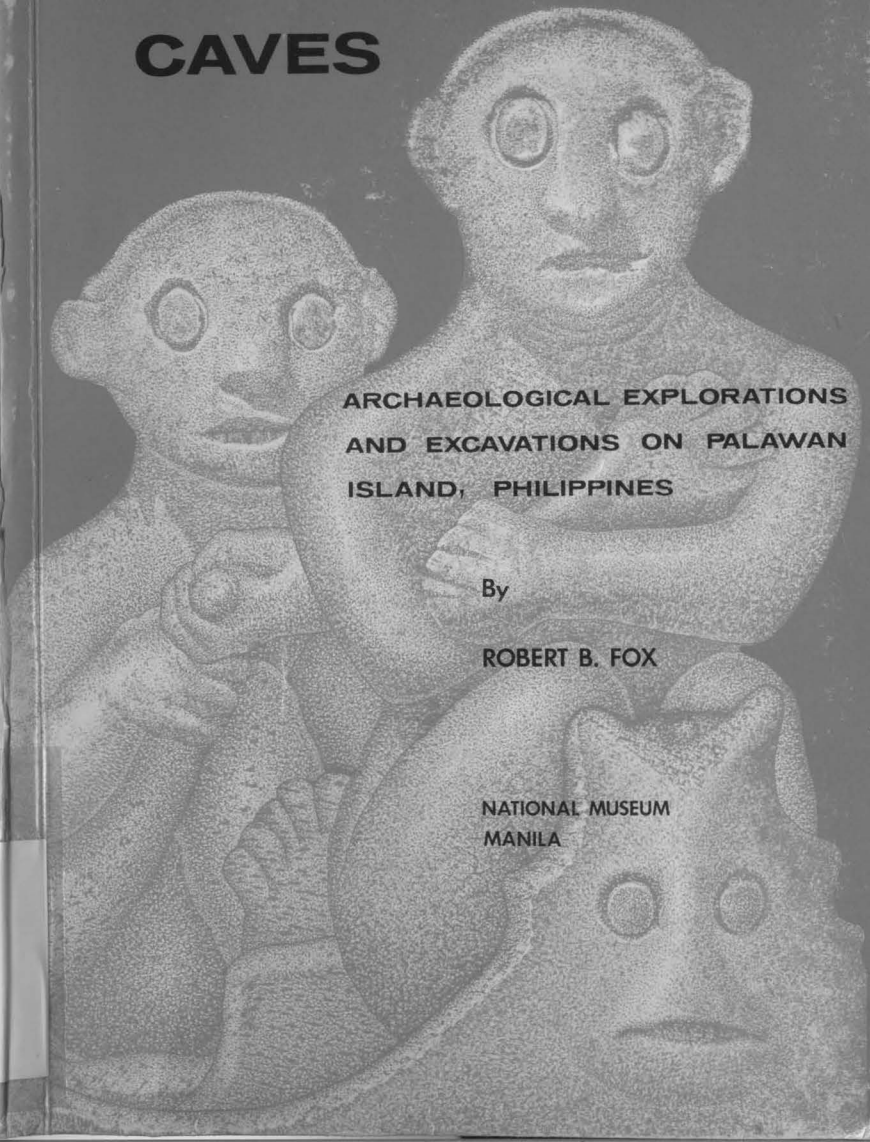
# THE TABON CAVES

ARCHAEOLOGICAL EXPLORATIONS  
AND EXCAVATIONS ON PALAWAN  
ISLAND, PHILIPPINES

By

ROBERT B. FOX

NATIONAL MUSEUM  
MANILA



## ERRATA (THE TABON CAVES):

- (1) Page viii, line 23 should read:  
"Color Plate I-A:..."
- (2) Page viii, line 24 should read:  
"Color Plate I-B:..."
- (3) Page viii, line 35 should read:  
"Spouted effigy vessel..."
- (4) Page I, line 8 of Footnote I should omit  
"...early..."
- (5) Page 16, line 25 should read:  
"...and 2840<sup>+</sup>..."
- (6) Page 17, line 34 should read:  
"9250<sup>+</sup>250 B.P."
- (7) Page 51, line 20 should read:  
"Plates I-B: a,b,c)."
- (8) Page 51, line 23 should read:  
"I-A-k..."
- (9) Page 102, line 15 of footnote should read:  
"The forms too are..."
- (10) Page 107, line 2 of Table VIII should read:  
"dorsal surface removed (Color Plate I-A:r);"
- (11) Page 112, line 14 should read:  
"...iron implements..."
- (12) Page 115, line 2 of caption Fig. 35 should read:  
"the medium is..."
- (13) Page 117, line 9 should read:  
"... (see Table IX)..."
- (14) Page 118, line 5 should read:  
"... (Table IX)..."
- (15) Page 119, line 16 should read:  
"...The physical fea..."
- (16) Page 129, line 24 should read:  
"... (Fig. 35)..."
- (17) Page 132, line 10 should read:  
"...Uyaw Cave (Fig. 39-b)..."
- (18) Page 134, line 33 should read:  
"... (Fig. 39-a)..."
- (19) Page 142, lines 6-9 should read:  
"J. Acid etched stone bead from Manunggul Cave  
Chamber B (Metal Age: Developed Period)"  
"K. Acid etched carnelian bead from Guri Cave  
(Metal Age: Early Period)"
- (20) Page 144 should read with additional descriptions  
of Color Plate I-B:  
"T opaque glass bead (Metal Age)"  
"U-W Glass beads from Bubulungon Cave No. 1:  
Chamber B (Age of Contacts and Trade with the East)"
- (21) Page 146 caption should read:  
"Fig. 42."
- (22) Page 149, caption of Fig. 45 should read:  
"Spouted effigy vessel..."
- (23) Page 153, line 9 should read:  
"(Table XII)"
- (24) Page 194, line 4 should read:  
"Mabuchi, Toichi"

# THE TABON CAVES

ARCHAEOLOGICAL EXPLORATIONS  
AND EXCAVATIONS ON PALAWAN  
ISLAND, PHILIPPINES

*To Kwang-chik Chang  
with respect respect  
and regards,  
Barot*

By  
ROBERT B. FOX

Monograph of the NATIONAL MUSEUM

Number 1

MANILA  
1970

GN  
875  
P6  
F6

**COLOR FRONTISPIECE:** A superb example of a Late Neolithic burial jar from Manunggul Cave, Lipuun Point, Palawan. The jar cover represents souls sailing to the afterworld in a death boat. Height, 66.5 cm.; diameter at greatest width, 51.5 cm.



**MANUNGGUL JAR**

# CONTENTS

FRONTISPIECE .....	ii
LIST OF FIGURES AND TABLES .....	vi
PREFACE .....	ix
CHAPTER	
I. INTRODUCTION TO THE ARCHAEOLOGY OF PALAWAN .....	1
II. TABON CAVE: AN UPPER PALAEOLITHIC HABITATION SITE .....	21
III. GURI CAVE: A POST-PLEISTOCENE HABITATION SITE WITH UPPER PALAEOLITHIC FLAKE ASSEMBLAGES AND A NEW LITHIC TECHNOLOGY .....	45
IV. DUYONG CAVE: A STRATIFIED SITE WITH A SMALL FLAKE AND BLADE INDUSTRY AND NEOLITHIC ASSEMBLAGES .....	53
V. THE JAR BURIAL COMPLEX OF THE TABON CAVES .....	67
THE TABON POTTERY COMPLEX .....	75
VI. THE CULTURAL ASSEMBLAGES OF SIX JAR BURIAL CAVES AND CHRONOLOGICAL DEVELOPMENTS .....	105
NGIPE'T DULDUG CAVE .....	105
MANUNGGUL CAVE .....	109
DUYONG CAVE AND UYAW CAVE .....	119
PAGAYONA CAVE .....	145
TADYAW CAVE .....	151
VII. NOTES ON THE CULTURAL CHRONOLOGY AND RELATIONSHIPS OF THE JAR BURIAL COMPLEX OF THE TABON CAVES AND PALAWAN .....	157
VIII. TEST EXCAVATIONS AND EXPLORATIONS IN PALAWAN .....	167
APPENDIX I: DEATH, BONE WASHING, AND JAR BURIAL AMONG THE SULOD OF CENTRAL PANAY, PHILIPPINES .....	181
REFERENCES .....	189
ILLUSTRATIONS .....	198

## DEDICATION

This report is dedicated to my co-workers in the National Museum of the Philippines. The data presented are a product of their individual efforts and of having worked together towards a more detailed definition of a part of the complex prehistory of the Filipino people.



# LIST OF FIGURES AND TABLES

TEXT FIGURES	PAGE		PAGE
1. Map of Palawan Island, showing the location of the Tabon Caves and the major archaeological sites discussed in the text. ....	3	15. Jar with Cover Hidden on Shelf in Guri Cave (x 1/4 natural size). ....	51
2. Map of Palawan Island, showing the location of Tabon Caves and other areas discussed in the text. The insert shows the location of Palawan Island with reference to the Philippines and Borneo and the 50 fathom line. ....	5	16. Floor Plan of Duyong Cave; contour interval is 40 cm. ....	55
3. Gold ornament with Garuda image. ....	6	17. Profile of Duyong Cave showing stratigraphic features. ....	57
4. Polished Stone Tool from Aborlan, Palawan. ....	7	18. Small Flake and Blade Assemblage from Duyong Cave. ....	61
5. Map of the Quezon Area, west coast of Palawan Island, showing Lipuun Point and the Tabon Caves, and other caves excavated or described. ....	12	19. Artifacts associated with Neolithic Burial in Duyong Cave: a) large <i>Tridacna</i> shell adze; (b) front and back view of smaller <i>Tridacna</i> adze-axe; (c) shell pendant; (d) front and back view of Cone shell ear ornament; (e) large polished stone adze; (f) lime container with Duyong Neolithic burial; and (g) similar <i>Arca</i> shell line container from Bato Puti Cave, Lipuun Point. ....	63
6. Floor Plan of Tabon Cave with areas excavated indicated by dark shading. ....	23	20. Edge-ground tools: (a) from Pilanduk Cave; (b) from Mara'may Cave. ....	66
7. Tools from Tabon Cave: (a-m) examples of flake tools associated with Flake Assemblage III; (n-o) choppers; (p) quartz hammer stone. ....	30	21. Tabon Impressed: Representative sherds from Duyong Cave of this pottery type, including bound paddle and carved paddle. ....	82
8. Plane view of limited area of Tabon Cave, 3x7 meters in size and from 85 to 115 cm. in depth, showing distribution of chert and hammer stones which form workshop and habitation areas. ....	32	22. Tabon Impressed: Examples of Rim Impressions and Scal- loping of this pottery type from Duyong Cave. ....	84
9. Stratigraphic profiles of Tabon Cave: (A) Flake Assemblage II showing location and stratigraphic features; (B) Stratigraphic relationships between Flake Assemblages II and III; and (C) Large flake tools of Flake Assemblage II. ....	34	23. Two Burial Jars from Manunggul Cave (Chamber A). ....	86
10. Schematic profile of Lateral 11.5 in Tabon Cave, showing stratigraphic relationship of Flake Assemblages I, III, IV, and V (1966). ....	36	24. Tabon Incised and Impressed: Representative sherds of this pottery Types from Duyong Cave. ....	88
11. Flake tool from Sidangan, Zamboanga del Norte, showing highly developed unifacial secondary flaking not found in the Taboninian tradition. ....	37	25. Tabon Incised and Painted: a shallow bowl with four holes near the rim probably for suspension during rituals. ....	89
12. Fossil human bones from Tabon Cave: (a-d-e) Lateral, frontal, and ventral view of "Tabon Man" tentatively dated to 22-24,000 B.P. (b) Late Neolithic skull from Manunggul Cave, 710-890 B.C. (c) Early Metal Age skull from Bato Puti Cave; (f-g) fossil mandibles of two other individuals from Tabon Cave. ....	41	26. Some Vessel Forms of the Tabon Pottery Complex. ....	93
13. Floor Plan of Guri Cave. ....	46	27. Examples of Vessel Forms and Decorations of the Tabon Pottery Complex: (a) an example of Tabon Polished with highly burnished red slip, and usually tall, restricted neck; from Diwata Cave; (b) angle-bodied vessel from Diwata Cave with incised designs above the corner point (c) Angle-bodied bowl from Diwata Cave with incised designs above the corner point and paddle impressed designs over the lower body and base; an example of Tabon Incised and Impressed; (d) shallow bowl, Tabon Polished, from Diwata Cave with unusual in-turning rim; (e) further example of a vessel belonging to the pottery type Tabon Incised from Duyong Cave; (f) an unusual cover box from Bato Puti Cave which contained the painted teeth of more than one individual. ....	95
14. Flake Tools from Guri Cave. ....	49	28. Design Patterns of the Tabon Pottery Complex. ....	97

	PAGE
29. Burial jars and trunconical jar covers from Sa-huynh, Indo-China [after Janse (1959) Fig. 1; and Solheim (1959b) Figs. 1 and 2] showing relationships with those of the Tabon Caves.	101
30. Floor Plan of Ngipe't Duldug Cave, a Late Neolithic Jar Burial Site.	106
31. Restored Vessels from Ngipe't Duldug Cave.	108
32. Floor Plan of Manunggul Cave: Chamber A is Late Neolithic and Chamber B and Area C are associated with iron implements.	110
33. Funerary Vessels from Chamber A, Manunggul Cave.	113
34. Details of the spirit boat on the jar cover from Manunggul Cave.	114
35. Carved turtle from Pawikan Shelf; the material is possibly old ivory.	115
36. Floor Plan of Uyaw Cave.	120
37. Nephrite (Jade) Ornaments of the Early Metal Age.	125
38. Nephrite (Jade) Bracelets from the Tabon Caves.	128
39. Bronze Adzes and Fire Clay Moulds for making Adzes from the Tabon Caves.	133
40. Bronze Implements of the Early Metal Age and cross-section of sherds showing cover sealed to jar.	138
41. Glass Ear-Pendant from Rito-Fabian Cave.	139
Color Plate I-A : Stone and Shell Beads from Palawan	141
Color Plate I-B : Glass and Gold Beads from Palawan	143
42. Shell Artifacts from the Tabon Caves; (a) Scoop made from <i>Melo diadema</i> ; (b-d) Chamber Nautilus spoons; (e) Neolithic <i>Tridacna</i> shell implement from Duyong Cave; (f) Scoop made from <i>Cassis cornuta</i> from Batu Puti Cave; and (g) Shell rice-scraper from Duyong Cave.	146
43. Clay Pendants: (a) type of Ear pendant from Pagayona and Duyong Cave; (b) Ear-pendant from Batu Puti; (c) and Duyong Cave.	147
44. Pagayona Cave: Floor Plan showing Forms of all Restored Vessels and their Positions in the Cave.	148
45. Spouted vessel/effigy from Pagayona Cave (x 2/3 natural size).	149
46. Floor Plan of Tadyaw Cave.	150
47. Forms of Iron Spears and Knives from Tadyaw Cave.	152

	PAGE
48. Nephrite bracelet from Tadyaw Cave.	153
49. Forms of Trunconical Covers from the Tabon Caves.	154
50. Sasak Rock Shelter: rimsherds showing "Sloping-S" Designs.	170
51. Lungun Cave: (a) Log Coffin for secondary burial (x 1/5 natural size); (b and c) knives from the coffin; and (d) decorated bowl believed to be associated with coffin.	172
52. Kuruswanan Ledge: Boat Coffin for Primary Burial.	173
53. Magmisi Shelf: Earthenware jar associated with Chinese trade pottery of the Sung Dynasty.	174
54. Modern Earthenware vessel made by Pala'wan of Quezon showing persistence of incised and impressed designs.	175
55. Tridacna Shell Tools: (A) From Sanga Sanga Island, near Tawi Tawi, Sulu Archipelago; and (B) From Paredes Shelter, Langen Island, El Nido, Palawan.	179

## TABLES

1. The Tabon Caves: The Cultural Assemblages and Status of the Excavations in 1966.	9
2. Chronology of the Cultural Assemblages from the Tabon Caves and Caves of the Quezon Area.	14
3. The Flake Assemblages from Tabon Cave.	24
4. A Sample Classification of Chert and their Percentages of Flake Assemblage III.	35
5. Shells in the Duyong Midden Associated with the small Flake and Blade Assemblage.	58
6. Comparisons of the Stone, Metal, and Glass Artifacts from nine Jar Burial Caves.	69
7. Approximate Percentages of Pottery Types from selected Tabon Caves.	79
8. Late Neolithic Bead Types from Ngipe't Duldug, Cave, Quezon, and Leta Leta Cave, El Nido, Palawan.	107
9. Comparison of types of artifacts from Chamber A and Chamber B of Manunggul Cave	111
10. Chronology of the "lingling-o" type of Jade Ear-pendant from the Tabon Caves.	127
11. Analysis for Copper, Tin, and Zinc of two Socketed Adzes from Quezon, Palawan.	135
12. Carnelian and Jade Beads in Relationship to the Cultural Chronology of the Tabon Caves.	135
13. Status of Archaeological Excavations and Explorations of Cave sites on Palawan Island through 1966.	167

## P R E F A C E

The financial support of many institutions and persons made possible the extensive excavations and explorations on Palawan Island. From 3 July, 1962, to 30 June, 1965, the field work was financed by three grants-in-aid from the *National Science Development Board*; the first time in the history of Philippine archaeology that excavations have been adequately supported by government funds.

A grant from *The Asia Foundation* made possible the initial explorations in Palawan and finally the discovery of Tabon Cave on 28 April, 1962, by the author and Mr. Manuel Ma. Santiago. The subsequent excavations in Tabon Cave until the end of June, 1962, were also supported by *The Asia Foundation*, and most of the technical equipment used during the field work had been provided by an earlier grant-in-aid from this Foundation.

The latest explorations and excavations by the National Museum in Palawan from 11 September, 1965, through 1966 were supported by a timely grant from the *National Geographic Society*. Mr. Galo B. Ocampo, former Director of the National Museum, allocated, whenever possible, much of the very limited funds of the National Museum to carry on the "Palawan Project."

The current excavations in Palawan being undertaken in coordination with Mr. Jonathan Kress of Yale University have been supported in every possible way by the present Director of the National Museum, Mrs. Gemma Cruz Araneta.

Additional assistance was provided for by many Filipino and American firms and individuals who donated through the *Research Foundation in Philippine Anthropology and Archaeology, Inc.*, the equipment and supplies which were used daily during the field work. Former President of the Research Foundation, Mr. Hans Kasten, and Mrs. Sixto Roxas III, the present President, were particularly active in obtaining support for the excavations in Palawan, as well as for the archaeological program in general of the National Museum. Further financial aid was given by Mr. and Mrs. Leandro Locsin, Mr. and Mrs. Louis Sheff, and Don Fernando Zóbel de Ayala.

Many persons deeply interested in the Foundations of contemporary Filipino culture have contributed immeasurably to the success of the Palawan excavations. The Honorable Alejandro R.

Roces, former Secretary of Education and his brother, Mr. Alfredo Roces, writer and artist; former Senator Manuel P. Manahan; the late Dr. Paulino Garcia, former Secretary of Health and former Chairman of *NSDB*; and Dr. Juan Salcedo, present Chairman of *NSDB*; Dr. Canuto G. Manuel, former Commissioner of the *National Institute of Science and Technology*; Mr. Ramon A. D. Hermano and Mr. Antonio J. A. Pido of the *Social Sciences and Humanities Branch of the NSDB*; the late Mr. Patrick Judge of *The Asia Foundation*; Secretary Manuel Elizalde, Jr.; the Honourable Telesforo Paredes, former Governor of Palawan; and Governor Salvador Socrates; all helped to make the "Palawan Project" possible.

Local officials of Palawan, friends of the author and the National Museum, have helped the field team in many ways. The pioneer of Quezon, the late Mr. Vicente Pagayona, Sr., and his sons, Messrs. Cenon Pagayona, Victor Pagayona, and Mr. Juan Pagayona who was formerly Municipal Mayor of Quezon, Mr. Ben delas Alas of Tabon, Mr. and Mrs. Felix Rafols and Mr. and Mrs. Felipe de la Peña of Puerto Princesa, Mr. and Mrs. Martin Baalan of NARRA, Panacan, Mrs. Leo Virata, Mr. Jesus Cabarrus, Jr., Mr. Benito Legarda, Jr., Mr. Jaime Calero, Mr. Michael Parsons, Mr. Patrick Parsons, Mr. Martin Tinio, Mr. Fred Elizalde, and many others have all in one way or another insured the success of the excavations in the Tabon Caves.

The officers and men of the United States Coast Guard LORAN Station at Tarumpitao provided many emergency services and made our "isolated duty" more pleasant.

The author wishes to express his deepest gratitude for the professional and technical help given by Dr. Richard Shutler, Mr. Jonathan Kress, Dr. Graham Clark, Dr. Richard Mulvaney, Dr. Wilhelm G. Solheim II, Dr. F. Landa Jocano, and Mr. Tom Harrisson, former Curator of the *Sarawak Museum* and Government Ethnologist, Malaysia, whose publications have been extensively cited in this report. Dr. Daniel Scheans spent one month in Palawan with the author assisting in the analyses of the materials excavated, and Dr. Fred Eggan of the University of Chicago has, as always, guided the work of the author. I am also particularly grateful to Dr. W. F. Libby, Dr. G. J. Fergusson, and Dr. R. Berger of the *Institute of Geophysics, University of California at Los Angeles*, who have made possible without cost the series of highly important C-14 determinations which are presented in this report. To those many individuals and institutions, the author and the anthropology staff of the National Museum wish to express their sincere gratitude.

Their financial support and professional cooperation made the excavations in Palawan a reality.

The excavations in the Tabon Caves were wholly a project of the National Museum of the Philippines and the participating professional personnel were drawn entirely from this institution. Direction of the actual field work and technical decisions were made by the author and he alone is responsible for the opinions set forth in this report. Individuals from the Division of Anthropology who participated in the Palawan excavations were Messrs. Alfredo Evangelista, Eric Casiño, Domingo Trinidad, Manuel Santiago, and Macario Santos. Mr. Manuel Santiago, with the help of Mr. Macario Santos and Mr. Ruperto Santiago, prepared the many line drawings found in this report. A large series of field photographs were taken by Mr. Manuel Santiago and the author, or by Mr. Jose Sarmiento, Chief Photographer, *Philippine Tourist and Travel Association*. In 1968, many additional photographs were taken by Mr. Joseph Scherschel and Dr. Paul Zahl of the *National Geographic Society*.

The field team was particularly fortunate to have had the help of Mr. Inocentes Paniza, Geologist of the National Museum, who is also a field archaeologist. Mr. Paniza was with the author during most of the excavations of Tabon Cave and he is preparing a report on the geology of Lipuun Point and the Quezon Area. Mr. Godofredo Alcasid and Mr. Demetrio Mendoza, Chiefs of the Divisions of Zoology and Botany respectively, made brief field studies of the limestone fauna and flora of the area which will be included in the final site report for Tabon Cave.

The local labor force was headed by Messrs. Victor Decalan, Teodoro Nidugma, and Pidlas Bukwan. They were primarily responsible for the accessioning of the thousands of artifacts excavated, the restoration of pottery for study and display in the Museum, the maintenance of the Field Station and equipment, and the explorations. The remaining labor force composed of many industrious men who had varied and practical talents useful in this frontier area was drawn either from recent settlers in Palawan who came from many areas of the Philippines, or from the local Pala'wan and Tagbanwa minority groups. Men from the latter groups were of special value to the field team, for they knew the location of some caves and folklore about the caves, the local place names, and the source of materials, such as chert, which were excavated. In addition, their traditional knowledge and present cultural practices have been weighed in

the interpretation of the use of artifacts and of past cultural patterns suggested by the archaeological data.

The men who worked from time to time, in addition to those noted above, were: Sipar Amli, William Apolinario, Bidtil Badjaw, Angcang Bantocan, Utio Bukwan, Awang Buyon, Lamin Dalansa, Fidel Descada, Conrado Debis, Pablo Fabian, Wilfredo Gabuco, Tirso Gombang, Junior Imok, Ignacio Ingrad, Mendik Lapit, Guzman Magkuha, Vitaliano Monte, Nehemias Rito, Elmo dela Rosa, Villamor dela Rosa, and Timotiyo Tayao.

Many local and foreign visitors, friends of the writer from Manila, and in particular members of the United States Peace Corps, labored in the caves during holidays and vacations; some for a period of a week and others for a month or more. Mrs. Tonny Resmann of Sweden spent over two months working in the Tabon Caves. Others included: Dr. and Mrs. David Bonnet and their sons, Scott and Charles; Darrel F. Clark, Virginia Cochran, Carlos Fernandez, Capt. Robert Fisher, Linda Henry, Lt. (jg) Richard Johnson, Janet Karon, Robert Miller, Marcia Sawlan, Rachel Singer, John Schricker, Lonnie Spencer, William Thompson, Mrs. Myrtle Greenwalt, Mr. and Mrs. Alan White, and Mr. and Mrs. Charles Townsend. Their efforts as volunteer workers made possible the actual continuation of the excavations when funds were low. Their unending questions led in many instances to re-examinations of data and interpretations. Mr. Mauro Garcia, Fern Landau, and Mr. E.D. Hester made many suggestions and read proof on the typescript.

## CHAPTER I

### INTRODUCTION TO THE ARCHAEOLOGY OF PALAWAN

This report briefly summarizes the results of the excavations by the staff of the National Museum from 1962 through 1966 in a number of limestone caves—now known as the Tabon Caves—located on the isolated southwest coast of Palawan Island, Republic of the Philippines. The researches are still in progress and detailed site reports of the caves which have diagnostic assemblages of cultural materials will be published when the excavations and analyses are completed.

This report also seeks to provide a preliminary chronology for the time and cultural sequences encountered during the Palawan excavations. This chronology is supported by thirteen radiocarbon (C-14) dates of major interest to Philippine and Southeast Asian prehistory. Based upon the *preliminary analyses*, four broad cultural "Ages" have been established and used in the descriptions of the sequences: (1) the *Palaeolithic Age*; the *Neolithic Age*, with "Early" and "Late" periods and phases; the *Metal Age* with "Early" and "Developed" periods and phases; and the *Age of Contacts and Trade with the East*.<sup>1</sup> The larger objective of the archaeological research in Palawan was to establish an exhaustive cultural chronology for this area which could provide the basis

---

<sup>1</sup> In order to accommodate the growing body of new archaeological data from recent excavations in the Philippines the author has employed a broad, general, fourfold division of the major "Ages" of Philippine prehistory. The available archaeological record for the Philippines is still far too sketchy to allow at this time for the meaningful use of a multilineal development scheme as suggested by Jocano (1965) and attempted by Evangelista (1966 and 1967). Where comparative data indicate widespread cultural and temporal divisions of the four Ages, the term "Periods" is used, such as the ~~early~~ "Early Period" of the Neolithic or simply the "Early Neolithic." Local time and cultural sequences of a Period are described as "Phases." Where a number of phases within a limited geographical area show relationship the term "Horizon" is used. The total corpus of artifacts from a site which are temporally associated are described as "assemblages," and related types of artifacts or assemblages of artifacts from different sites are treated as "complexes," such as the "Tabon Pottery Complex" or the "Jar Burial Complex." The term "tradition" is used to indicate broad relationships through time and space, either of types of artifacts, assemblages of artifacts, or trait complexes.

for a more thorough understanding of the long and dramatic prehistory of the Philippines.

Mention also will be made of the explorations and test excavations made elsewhere in Palawan which had been undertaken with the hopes of locating additional habitation and burial sites of Ancient Man, and of establishing broader spatial relationships with the early cultures of the Tabon Caves.

It would be difficult to exaggerate the great wealth of archaeological materials which were uncovered in Palawan. Nearly five years have been spent by the writer and his co-workers in Palawan; nevertheless, the excavations in the Tabon Caves may be described only as "preliminary," and systematic explorations of the many extensive limestone exposures throughout the west coast of the Island have just been started. Years will be required to complete the excavations of the key sites already surveyed, and an adequate program for support of future archaeological work in Palawan remains the single most pressing problem.

In the following pages, a few general remarks will be made about the Quezon area in relationship to the unusually large number of cave sites found there. Then, selected caves and their cultural assemblages will be discussed in their tentative chronological position, illustrating the temporal range of the cultural sequences excavated. A summary of the cultural chronology of the archaeological materials from the Tabon Caves and other caves in the nearby Quezon area, as based upon present evidences, is set forth early in the text as Table II. Some comparisons with relevant data from neighboring regions are included in the text, particularly with the time and cultural sequences excavated in the Niah Caves, Borneo, by Tom and Barbara Harrison (1957, 1959 and 1964). Brief references are also made to data from archaeological sites found elsewhere in the Philippines; reference notably to the studies of the late Professor H. Otley Beyer, the Dean of Philippine Archaeology. It must be stressed, however, that the writer did not and could not attempt any detailed comparison of the time and cultural sequences recovered in the Tabon Caves with possibly related archaeological materials found elsewhere on the mainland of Asia and in Southeast Asia, for the very limited library facilities available in the Philippines precluded this work. This remains a future task. And, the sources available to the writer generally provided too few details for

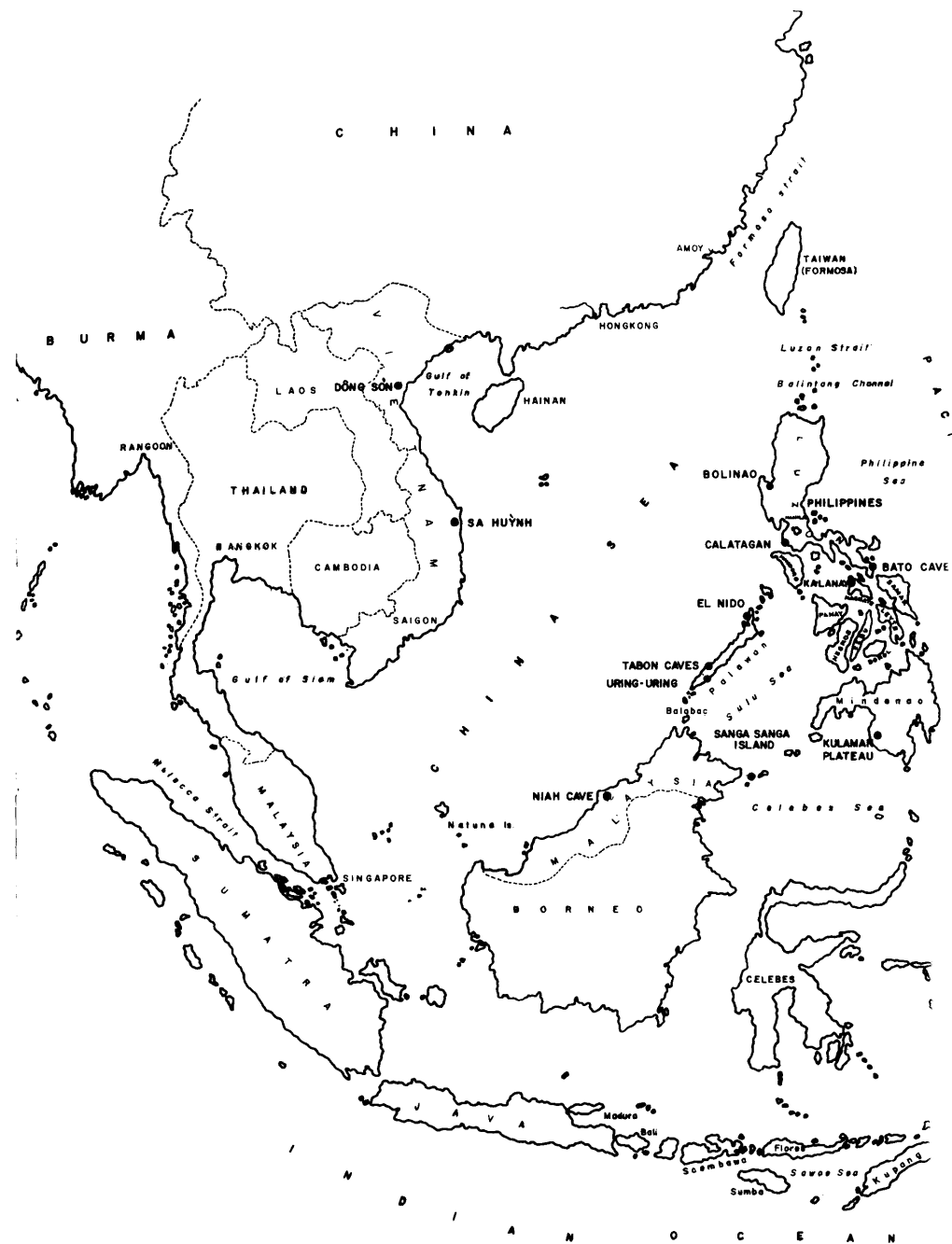


Fig. 1. Map of South China and Southeast Asia, showing the location of the archaeological sites discussed in the text.

significant cultural-historical comparisons. The principal aim of this study is a brief chronological presentation of the key archaeological assemblages excavated in Palawan.

Appendix I, a study of death and jar burial among the Sulod of Central Panay Island by Dr. F. Landa Jocano of the University of the Philippines and formerly with the National Museum provides social and cultural details for a contemporary practice of jar burial in the Philippines. As site reports will be published for each of the major cave excavated, no attempt is made in this brief summary report to present the detailed typologies of the tens-of-thousands of artifacts found. Rather, numerous line drawings and photographs are included to illustrate the general characteristics of the great range of the artifacts.

*Palawan Island and Past Archaeological Research.*—The island of Palawan (Figs. 1 and 2) stands as a natural bridge between the Philippine Archipelago and Borneo and, indirectly, the mainland of Asia. During glacial periods, Palawan formed a land bridge with Borneo or between Borneo and the Philippines, allowing Palaeolithic men and animals to drift into the Islands. Since Neolithic times and until the present, people sailed into or from the Philippines along either the east or west coasts of Palawan, finding protection on one side or the other of the Island from the large waves built by the prevailing monsoons. The geographical position of Palawan as well as that of the Calamian Islands was thus crucial to past movements of peoples and cultures into and from the central and northern Philippines.

The present excavations are, nevertheless, the first systematic excavations on the island of Palawan. Dr. Carl Guthe visited the El Nido (Bacquit) area on the northwest coast of Palawan during the University of Michigan Expedition to the Philippines from 1922 to 1925 and located and made brief test excavations in four caves. The artifacts from these four caves have been discussed briefly by Solheim (1964a: 81) in his study of the "Iron Age" in the central Philippines. One of the sites tested by Guthe and designated "Site C-67" (Fig. 2) by him was completely excavated in 1965 by the writer. Although included as an "Iron

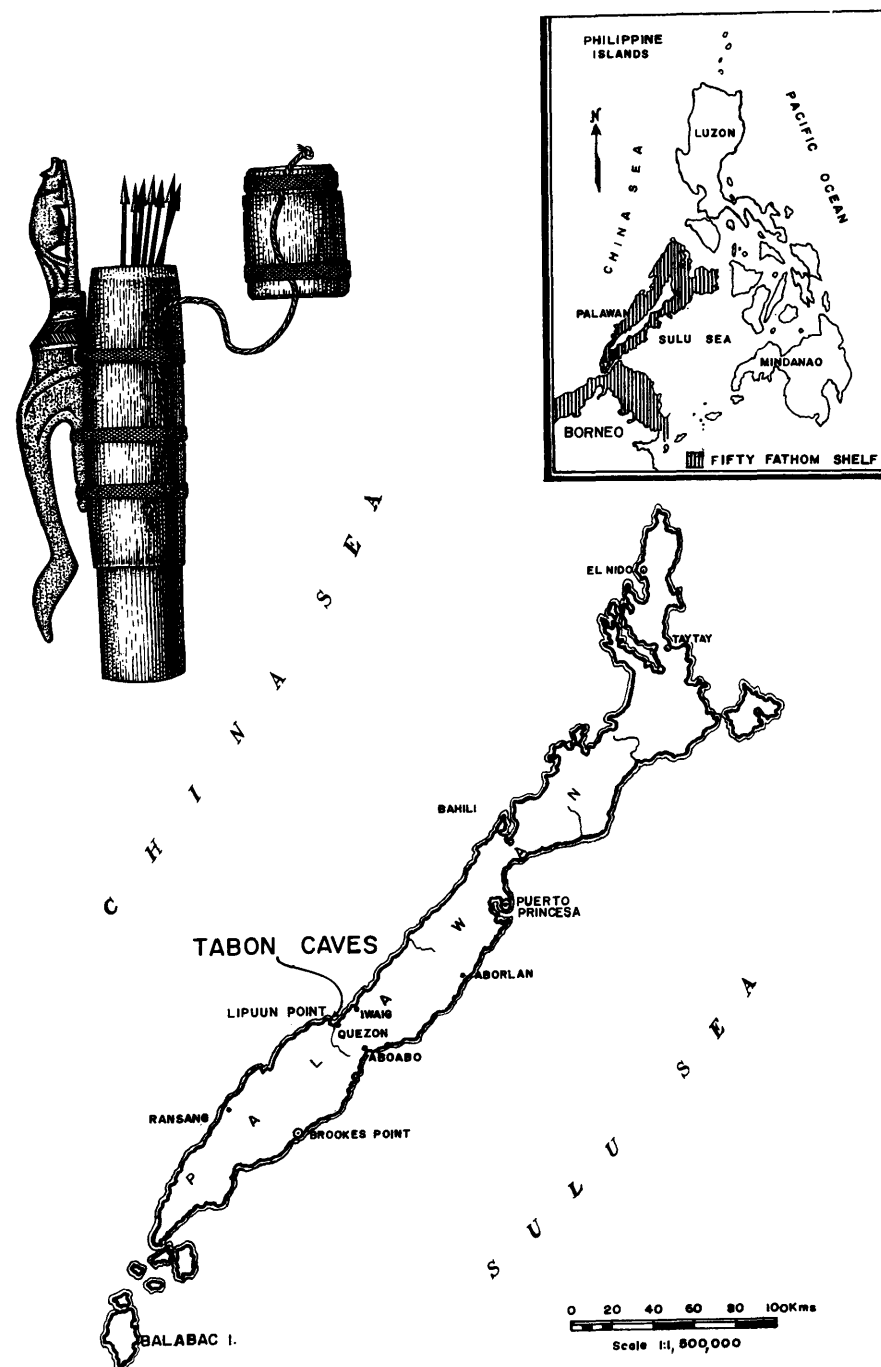


Fig. 2. Map of Palawan Island, showing the location of the Tabon Caves and other areas discussed in the text. The insert shows the location of Palawan Island with reference to the Philippines and Borneo, and the 50 fathom line.

Age" site in Solheim's (1964) study, this small rich burial site yielded a classic Late Neolithic stone tool and pottery assemblage, as well as Neolithic materials which probably date from the late phase of the Early Neolithic.

In 1932 and again in 1935, Mr. E. D. Hester visited the Uring Uring area south of Brook's Point on the east coast of Palawan and obtained a sizable collection of 14th, 15th, and 16th century trade potteries of Chinese, Siamese, and Annamese origin which had been accidentally excavated by local Pala'wan farmers while planting cassava [Beyer (1947) 298-299]. The writer and Mr. Manuel Santiago made a brief excavation in 1962 near Uring Uring of a small habitation site and recovered materials similar to those purchased by Mr. Hester.



Fig. 3. Gold ornament with Garuda image.

A few fine pieces of trade pottery and gold objects, including a superb gold ornament with a garuda image, the *vahama* or 'vehicle' of the Hindu god Vishnu, were also obtained by the writer at Uring (Fig. 3). These were with the original grave artifacts recovered before Mr. Hester's visit, but were hidden and treasured by Panglima Pisi's family and descendants. Dr. Juan R. Francisco, University of the Philippines, has identified the garuda ornament as dating from the Indonesian Majapahit period, 13th-14th centuries A.D., but the associated trade potteries from China, as noted, date from the late 14th to the 16th century A.D.

In 1951, the writer [Fox (1954) 274-275] collected a large polished stone tool from the Tagbanwa of Aborlan Municipality which was being used as a charm. This tool was described by Beyer as an "Early Neolithic Oval Adze." This is the first record of a Neolithic implement from the island of Palawan (Fig. 4.).

These data comprised our only knowledge of the pre-history of this major island—fifth ranking in the Philippines — until 1962 when the present excavations were begun in the Tabon Caves and others areas on the west coast of Palawan.

*Lipuun Point and The Tabon Caves.*—The data presented this report are primarily from the excavations made in the Tabon Caves and in one other cave, Duyong Cave, which is located in the Iwahig area some 11 kilometers up the coast from the Tabon Caves.<sup>2</sup>

The Tabon Caves are found in a striking limestone promontory which is visible from any direction for many kilometers, and honeycombed with at least two hundred caves and rock shelters. This point is called *Lipuun* by the local people (Fig.

5) but marked "Albion Head" on charts made from British surveys in 1851. Formerly an island, Lipuun Point is now connected to the mainland of Palawan by an extensive mangrove development. The Point is about one-hundred and four hectares in area and is formed by a number of rounded limestone domes separated

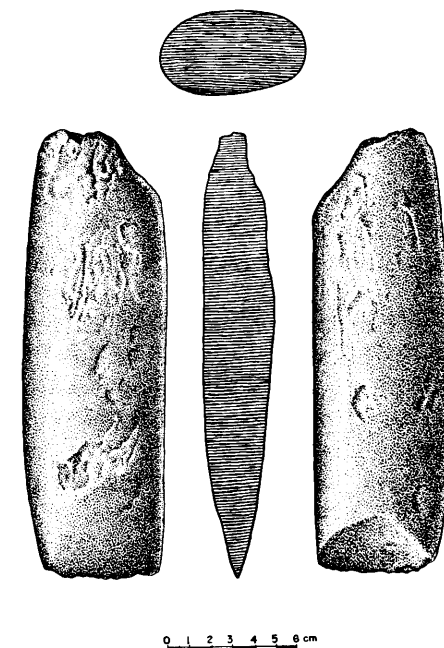


Fig. 4. Polished stone tool from Aborlan, Palawan.

<sup>2</sup> The description of the discovery of the Tabon Caves, methods used in the excavations, and problems of stratigraphy and dating have been discussed in detail in two earlier "Progress Reports" to the National Science Development Board (Fox 1962 and 1963). Subsequent excavations and the results of C-14 determinations have clarified many of the earlier problems. It is sufficient to note at this time that the excavators have employed the most rigorous archaeological controls. Grids were established in each cave, and the location and depth of all artifacts excavated were measured from datum points. When possible, excavations were made by natural and cultural deposits as indicated by different colors, texture, and hardness of strata, and not by mechanically established levels. Each cave was mapped and contoured. Profiles were accomplished during the actual excavation (in Tabon Cave changes in the strata were drawn on small scale profiles in their natural colors). Deposits were screened with 1/8 wire mesh. All artifacts recovered were accessioned in the cave with India ink and entered on mimeographed forms. The field records have been retyped and are in the files of the National Museum in Manila.



by deep chasms. The sides of these domes vary from steep slopes to sheer cliffs, the largest and highest dome being approximately 690 feet above the sea level (Plts. I and II). The entire Point is covered with luxuriant vegetation and the mouths of the caves cannot be easily seen from the surrounding sea. New caves containing surface artifacts were still being discovered even after five years of exploring Lipuun Point and unquestionably, there are still undiscovered cave sites. The age of the Lipuun limestone has been determined by oil geologists as mid-Miocene.

To date, twenty-nine caves used for habitation and/or burial have been discovered on Lipuun Point. These caves, as noted, contained an astonishing wealth and an extensive time-range of cultural materials: a flake tool tradition which dates from the Late Pleistocene and early post-Pleistocene periods, including fossil human bones and the bones of a deer now extinct in Palawan; a highly developed jar burial complex which first appeared during the Late Neolithic and continued into the Developed Metal Age; and finally, in two caves, porcelains and stonewares indicating local trade with China during the Sung and Yüan Dynasties. The excavations have revealed more than 50,000 years of Philippine prehistory!

Although excavations were made in sixteen of the twenty-nine Tabon Caves, only in nine caves were these completed. The general characteristic of the cultural assemblages of each of the Tabon Caves and the status of the work to the end of 1966 are set forth in Table 1. It will undoubtedly be necessary to modify present statements about the cultural assemblages of the caves where only testing or preliminary excavations have been made, for even small caves and rock shelters may be stratified with a wide range of time and cultural sequences. All caves have been given names for easy reference in addition to a permanent Museum site number which also forms the number used in the accessioning of all artifacts. If the cave was known to the local people and had a local name which was not too difficult orthographically, this name was retained. But if the cave was not known or named by the local inhabitants, it was given a Tagbanwa, Pala'wan, or Tagalog name related to the characteristics of the cave or to the archaeology and the ethnology generally of this area.

When these names differ, local place names encountered during the archaeological excavations and explorations are used rather than the place names found on the 1:50,000 series of maps for Palawan pre-

pared by the United States Army Map Service from aerial photographs. During actual field work, it is difficult to use place names found on maps which are not known to local inhabitants. When thought useful, the different names found on the maps were placed in the text in parentheses after the local name [e.g., *Magmisi* (Devil's Peak), a major site area in the Iwahig area]. Place names were also recorded phonemically and may not follow the orthography found on published maps.

*Cave Sites in The Quezon Area.*—The region surrounding Lipuun Point and the Tabon Caves—falling roughly within the new municipality of Quezon, Palawan—has about 30,000 hectares of scattered limestone exposures which also contain hundreds of caves and

Table 1

THE TABON CAVES:

*The Cultural Assemblages and Status of the Excavations in 1966*

<i>Name of Cave</i>	<i>Cultural Assemblages Established</i>	<i>Estimated Per Cent of Cave Deposits Excavated</i>
Agung	Jar Burial (surface)	0
Batu Puti	Neolithic Burials. Jar Burial	75
Bubulungan 1	Metal Age Jar Burial; Jar Burial with Sung Pottery; Palaeolithic(?)	35
Bubulungan II	Jar Burial (surface)	0
Decalan	Jar Burial	100
Diwata	Metal Age Jar Burial	100
Dugyan	Jar Burial (surface)	0
Guri (Chamber A)	Habitation with Flake and Blade Tools	20
(Chamber B)	Early Metal Age Jar Burial	100

Table I (cont.):

## THE TABON CAVES:

*The Cultural Assemblages and Status of Excavations in 1966*

<i>Name of Cave</i>	<i>Cultural Assemblages Established</i>	<i>Estimated Per Cent of Cave Deposits Excavated</i>
Igang	Jar Burial (surface)	0
Kabuwan	Jar Burial with Sung-Yüan Potteries	0
Karung	Jar Burial (surface)	0
Liyang	Neolithic Burial and Habitation; Jar Burial (surface)	0
Manunggul		
(Chamber A)	Neolithic Jar Burial	100
(Chamber B)	Metal Age Jar Burial	100
Mutya	Jar Burial (surface)	0
Ngipe't Duldug	Neolithic Jar Burial	100
Nigi	Jar Burial (surface)	100
Pagayona	Metal Age Jar Burial	100
Pawikan Ledge	Jar Burial	100
Pugay	Jar Burial (surface)	0
Ranggaw	Jar Burial (surface)	0
Rito-Fabian	Metal Age Jar Burial	100
Sarang	Jar Burial (surface)	0
Sarang		
Fissure	Jar Burial (surface)	0
Tabon	Palaeolithic Flake Assemblages; Early Metal Age Jar Burial	35
Tadyaw	Metal Age Jar Burial	30
Tarungtung	Jar Burial (surface)	0
Ukir Ukir	Cave Burials	20
Uyaw	Early Metal Age Jar Burial	100
Wasay	Jar Burial (surface)	0

rockshelters. Brief periods of exploration in this region have revealed thirty-five additional cave sites. And, only a very limited portion of this area has been systematically searched! One small but extremely rich cave near the mouth of the Iwahig River—Duyong Cave (Fig. 5)—was completely excavated. A detailed dis-

cussion of the cultural sequences found in Duyong Cave, as noted, is included in this report.

The exploration and test excavations in the caves found within the Quezon area have revealed cultural materials not encountered in the Tabon Caves. These include a small flake-and-blade industry (so-called "microliths" or "pseudo-microliths"); early to late Neolithic artifacts; uniquely decorated late Metal Age pottery; boat coffin and log coffin burials; Chinese tradewares of the Sung and Yüan Dynasty associated with locally made artifacts; as well as evidences of the use of the caves in recent times by ancestors of the contemporary Pala'wan people.

*The Environmental Setting of the Cave Sites.*—Three reasons at least account for the large number of archaeological sites which were found in the Quezon area—sixty-four caves and rock shelters containing surface artifacts. There are undoubtedly many other sites including the open habitation sites of the people who used the caves for burial purposes, but the lush tropical undergrowth and the relative lack of cultivated areas—Quezon is a pioneer settlement area with few people—greatly inhibited the search for these habitation sites. It is also very likely that the early inhabitants of Quezon lived in scattered hamlets of a few households, as do the pagan peoples in Palawan today, another reason explaining the difficulty of finding habitation sites.

The first and main reason for the large number of sites is the distinctive topography of the Quezon area. Running the length of Palawan is a rugged central mountain range which sharply divides the east and west coasts of the island. Although the distances are not great, the movements of people from one coast to another are difficult except in a few places, one being between Alfonso XIII (Quezon) and Abo Abo (Fig. 2). Here there is a sharp break in the mountains with only low rolling hills separating the two coasts and allowing for easy movements by man from one coast to the other. The sizable lowlands and the gentle slopes of hills in this area provide not only excellent settings for food-gathering and hunting but for later agricultural activities. A number of short-course rivers which teem with aquatic life also bisect the area.

The Spaniards also recognized the strategic significance of the topography of this area, building small coastal block houses of coral at Abo Abo and Alfonso XIII (Quezon) on each side of

the low divide in the central mountain chain. Test excavations by the Museum team in these two "forts" indicate that they date back only to the 19th century A.D.

Secondly, the Quezon area includes large shallow bays protected from the waves of the open China sea by a series of fringing reefs and islands, one of the latter—Masirik (Palm Island)—being a breeding ground for marine turtles. The inland waters of these protected bays and the reefs give the contemporary people their major source of protein—a great variety of fish, crustaceans, shellfish, turtles and turtle eggs, and the sea cow. Food remains from the cave sites also show that the bays and reefs have been a major source of protein for people during the past 7,000 years.

Finally, the numerous limestone outcroppings found on the west coast provided ancient food-gatherers and hunters with habitation sites, and later people with burial sites. In addition, small cave bats are a primary source of food among mountain groups today in Palawan, as in the Balabag Cliff area of the Ransang watershed, where contemporary people dwell from time to time in large limestone caves to gather bats. The archaeological evidence from Tabon Cave indicates that bats and probably cave swifts were a significant source of food during the Upper Palaeolithic. Harrison (1964): 183) notes too that the Great Cave of Niah "... was also a big attraction to early man... literally teeming with protein in the form of edible birds and bats."

Explorations elsewhere in Palawan (Table XIII) have still not revealed another area which has as great a number of archaeological sites as Quezon; certainly a reflection of the unique topography and rich environment of this area.

*A Brief Cultural Chronology of the Tabon Caves and Other Caves in the Quezon Area.*—Table II provides a summary of the cultural sequences revealed by the excavations to 1966 in the Tabon Caves and other caves found in the Quezon area. The relative and absolute dates presented are based upon either C-14 determinations, studies of the characteristics of the Chinese trade potteries, or comparative analyses of the diagnostic assemblages of artifacts from key cave sites. The locations of the caves discussed in Table II are shown in Figure 5.

Fig. 5. Map of the Quezon Area, west coast of Palawan Island, showing Lipun Point and the Tabon Caves, and other caves excavated or described.

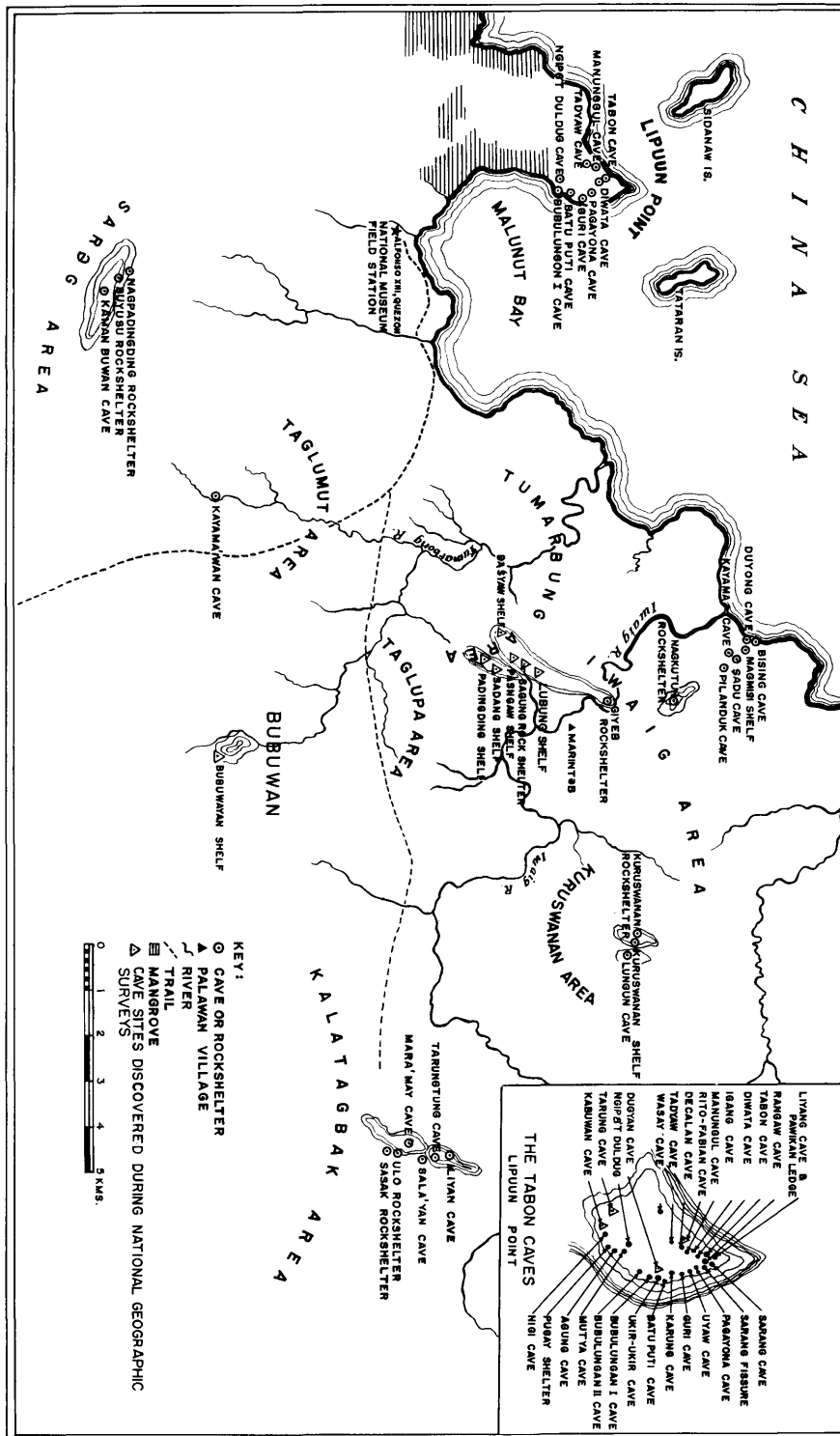


Table II

CHRONOLOGY OF CULTURAL ASSEMBLAGES FROM THE TABON  
CAVES AND CAVES OF THE QUEZON AREA

<i>Cultural Sequence</i>	<i>Caves and Characteristics of the Assemblages</i>	<i>Date and Methods of Dating</i>
<i>Proto-Historic:</i> Age of Contacts and Trade with the "Great Traditions" of South and East Asia, particularly South China	<i>Kuruswanan Ledge</i> (Kuruswanan Area) Primary burial in boat coffin	Early 14th or late 13th century A.D., associated with Chinese pottery of the Yüan Dynasty
	<i>Magmisi Shelf</i> (Iwahig Area) Secondary burial in earthenware jar	12th or 11th century A.D.; associated with Chinese pottery of the "Late" Sung Dynasty
	<i>Bubulungun Cave I-B</i> (Lipuun Point) Secondary jar burial with iron and Indo-Roman beads	11th to late 10th century A.D.; associated with "Early" Sung Trade pottery
<i>Metal Traditions:</i> <i>Developed Metal Age</i>	<i>Lungun Cave</i> (Kalatagbak Area) Multiple and secondary log coffin burial in association with iron and locally made pottery	c. 900-700 A.D. (?) by cultural comparisons; no Chinese pottery but "modern" types of iron implements
	<i>Sasak Shelter</i> (Kalatagbak Area) Stratified habitation and burial site; pottery with "Sloping-S" designs; iron and glass beads	c. 600-400 A.D. (?) or earlier by cultural comparisons

Table II (cont.)

CHRONOLOGY OF CULTURAL ASSEMBLAGES FROM THE TABON  
CAVES AND CAVES OF THE QUEZON AREA

<i>Cultural Sequence</i>	<i>Cave and Characteristics of the Assemblage</i>	<i>Date and Method of Dating</i>
<i>Metal Traditions:</i> <i>Developed Metal Age</i>	<i>Tadyaw Cave</i> (Lipuun Point) Burial jars with trunconical covers; iron and bronze; glass, gold, and carnelian beads; glass and jade bracelets	c. 300 A.D. to 100 B.C. by cultural comparisons
	<i>Manunggul Cave:</i> <i>Chamber B</i> Jar burial with iron; glass and stone beads; glass bracelets	C-14 date of 2140 ± 100 B.P.* or 190 B.C.; first C-14 date for an iron assemblage in the Philippines
	<i>Vicente Pagayona Sr., Cave</i> (Lipuun Point) Jar burial with trunconical covers; metals including iron, copper, and bronze; and glass beads	c. 200 A.D. to 200 B.C. by cultural comparisons
	<i>Rito-Fabian Cave</i> (Lipuun Point) Jar burial with iron, copper, and bronze; ear pendants of glass and jade; glass, shell, jade beads and bracelets	c. 100 A.D. to 200 B.C. by cultural comparisons

\* "B.P." indicates "Before Present" which by agreement of radiocarbon laboratories has been assigned a date of 1950. Thus, the year 1950 is used in conversions to "B.C." dates.

Table II (cont.)

CHRONOLOGY OF CULTURAL ASSEMBLAGES FROM THE TABON  
CAVES AND CAVES OF THE QUEZON AREA

<i>Cultural Sequence</i>	<i>Cave and Characteristics of the Assemblage</i>	<i>Date and Method of Dating</i>
<i>Metal Traditions:</i> <i>Early Metal Age</i>	<i>Guri Cave: Chamber B</i> (Lipuun Point) Jar burial with bronze but no iron; a few glass and gold beads; jade ear pendants	c. 100 B.C. to 300 B.C. by cultural comparisons
	<i>Uyaw Cave</i> (Lipuun Point) Jar burial with bronze adze and spear; stone adze; iron (?); jade ornaments; ancient glass beads and bracelets	c. 300 B.C. to 500 B.C. by cultural comparisons
	<i>Duyong Cave</i> (Iwaig Area) Jar burial with small Late Neolithic tools; bronze tools and iron (?); many ornaments of jade; no glass beads or bracelets	c. 300 B.C. to 500 B.C. or earlier by cultural comparisons
<i>Lithic Traditions:</i> <i>Late Neolithic</i>	<i>Manunggul Cave: Chamber A</i> Jar burial with sophisticated and highly decorated pottery; ornaments of jade and stone; no metals	C-14 dates of 2660 $\pm$ 80 B.P. (710 B.C.); and 2840 $\pm$ 80 B.P. (890 B.C.)
	<i>Ngipe't Duldug Cave</i> (Lipuun Point) Jar burial with stepped adze; stone and shell beads	c. 1000 B.C. to 1500 B.C. or earlier by cultural comparisons

Table II (cont.)

CHRONOLOGY OF CULTURAL ASSEMBLAGES FROM THE TABON  
CAVES AND CAVES OF THE QUEZON AREA

<i>Cultural Sequence</i>	<i>Cave and Characteristics of the Assemblage</i>	<i>Date and Method of Dating</i>
<i>Lithic Traditions:</i> <i>Early Neolithic</i>	<i>Duyong Cave</i> (Iwaig Area) Flexed burial with stone and <i>Tridacna</i> shell axes-adzes; shell lime containers and shell ornaments; and Neolithic habitation level	C-14 date of 4630 $\pm$ 250 B.P. (2680 B.C.)  C-14 date of 5,680 $\pm$ 80 B.P. (3730 B.C.)
	<i>Pilanduk Cave</i> (Iwaig Area) Edge-ground stone tool and flakes; jar burial	c. 3500 B.C. to 4500 B.C. (?) or earlier by cultural comparisons
<i>Small Flake-and-Blade Assemblage</i> a "hafted technology" (Mulvaney 1966)	<i>Duyong Cave</i> (Iwaig Area) Small flake and blade tools in shell midden	C-14 date of 7000 $\pm$ 250 B.P. (5050 B.C.)
<i>Flake and Flake-and-Blade Industries</i>	<i>Guri Cave</i> (Lipuun Point)	c. 2000 B.C. to 5000 B.C. and a late C-14 date of 4070 $\pm$ 80 B.P.
Flake tradition of a "nonhafted" technology; flake tools are a persisting Upper Palaeolithic tradition; blade tools represent a new technology	Flake tools but with more common (?) secondary retouching; blade tools appear in upper strata; all assemblages in thick midden of marine shells and animal bones	
<i>Upper Palaeolithic</i> "Tabonian" flake assemblages; a "nonhafted technology" (Mulvaney 1966)	<i>Tabon Cave</i> (Lipuun Point) Flake Assemblage 1-A  Flake Assemblage 1-B	c. 8500 to 9500 years ago (est.)  C-14 date of 9250 $\pm$ 250 B.P.

Table II (cont.)

CHRONOLOGY OF CULTURAL ASSEMBLAGES FROM THE TABON  
CAVES AND CAVES OF THE QUEZON AREA

<i>Cultural Sequence</i>	<i>Cave and Characteristics of the Assemblage</i>	<i>Date and Method of Dating</i>
	Flake Assemblage II	C-14 date of >21,000 B.P. (maximum date)
	Flake Assemblage III	C-14 dates of >22,000 B.P. and 23,000±1000 B.P.
	Flake Assemblage IV	C-14 date of 30,500±1100 B.P.
	Flake Assemblage V	45,000 to 50,000 years ago, or earlier, as based upon "depth-age" equation estimates

*Future Research in Palawan.*—At least three to four years of further excavations will be required in order to complete the work already started in the Tabon Caves and in the Quezon area in general, including the analysis of materials and the preparation of site reports. Additional explorations by water from Quezon into other limestone areas of southwestern and northwestern Palawan, particularly the Bahili, El Nido, and Taytay areas, are planned in order to obtain comparative data, as well as to protect the caves in these areas from looters. Excavations of key sites in these other areas will also be undertaken. Anticipating a long-range field project in Palawan, the National Museum has completed a first rate Field Station with facilities and space for laboratory work at Alfonso XIII, the administrative seat of Quezon Municipality, four kilometers by water from the Tabon Caves.

No attempt will be made by the National Museum to excavate every single cave site known to contain archaeological materials. Rather, it will excavate selected caves which represent different cultural and time sequences of Philippine prehistory, as determined by preliminary excavations, and then publish detailed site reports on these key cave sites. The primary goal of the

"Palawan Project" is to provide through systematic excavations a detailed *cultural chronology* for this area. This chronology may then be used:

- (a) to evaluate the past archaeological work done in the Philippines by Professor H. Otley Beyer and others, particularly to test the cultural chronology for the Island which was published by Beyer; and
- (b) to provide a sound foundation for detailed comparative studies with the archaeological data from other systematically excavated sites in the Philippines and in neighboring countries.

It is hoped that this report will attract other students of prehistory to the Philippines and Palawan. It would be impossible to exaggerate the great archaeological potential of the Philippines Islands which are intimately linked with the culture history of South China, Southeast Asia, and the Pacific world. Palawan is only one small area in the Philippines, but the problems involved in the excavations and analyses of the materials from the Tabon Caves alone will require the help of many archaeologists and specialists, particularly for the study of the pottery, beads, metals, stone tools, fossil human and animal bones, as well as specific research on the palaeobotany and geology of the Late Pleistocene. These findings are only the beginning.

## CHAPTER II

### TABON CAVE: AN UPPER PALAEOLITHIC HABITATION SITE

*Description of Tabon Cave and the Excavations.*—Tabon Cave is located at the base of a towering limestone cliff at the northeast corner of Lipuun Point facing the South China sea. The mouth of the cave, approximately 110 feet above sea level, is large being eight meters in height and sixteen meters in width (Plts. III, IV and V). A small cliff lies directly in front of the mouth of the cave. The dome-shaped entrance chamber is nearly forty-one meters in length, being dry and bathed by sunlight throughout the day. Tabon Cave provides a perfect setting for habitation in contrast to the hundreds of other caves on Lipuun Point which have narrow openings and dark inner chambers. The ideal physical features of the cave explains why Ancient Man chose Tabon Cave as a dwelling place during, at least, 40,000 years of the Late Pleistocene.

Stalactites continue to grow at the right rear of the cave, their tips sloping toward the mouth, but even in this area the cave is now dry. One large stalactite fell near the mouth on the left side of the cave, after a long period of occupation by Palaeolithic Man. Many tools of Flake Assemblage II were found directly beneath this stalactite. Numerous stalactites also fell in the area of Flake Assemblage I-A along the right wall of the cave. However, most of the ceiling of the cave has apparently been stable for thousands of years, as the ancient floors show little accumulation of fallen rubble. No bats and only a few families of swifts were living in the cave when it was first discovered, and the swifts quickly abandoned their nest when the excavations were begun. The entire cave, nevertheless, is filled with guano which, as based upon the angle of the slope of the bedrock near the mouth of the cave, is estimated to be at least six or more meters in depth. Thus, Tabon Cave must have had a sizable number of bat and bird residents during some periods of its history.

The thick guano deposits, as well as the ancient floors formed by dripping water which were revealed during the excavations, would indicate too that there had been some changes in the structure of the ceiling of the cave since it was first occupied by Palaeolithic man. And, that the cave may have been quite wet during past periods. The present floor of the cave shows

little resemblance to the contours of the ancient floors. The major archaeological problem initially faced by the field team was the relationships of the many ancient floors in the cave to the scattered levels and areas of habitation. But a longitudinal center-trench from the mouth of the cave to the rear wall and a lateral trench mid-way back into the cave has established, despite early problems, six distinct levels and areas of occupation or "frequentation," as Harrisson remarks (1964: 179); and unquestionably new cultural levels and areas occupied will be found in 1969-70 during further excavations in Tabon Cave.

The initial excavations were complicated by the fact that a portion of the cave had been disturbed by the Philippine Mound Builder (*Megapodius freycinet cumingii*) or *Tabon* bird after which the cave was named. The *Tabon* bird scratches deep holes in the guano of caves or in soft beach sands to lay its eggs. Some of the holes in Tabon Cave reach 130 cm. in depth which have exposed and disturbed artifacts from the 22,000 year level. Further disturbances have also been caused by large monitor lizards digging for the *Tabon* eggs. One lizard which measured one meter and a half in length was killed in Tabon Cave. The areas disturbed by the *Tabon* bird are easily distinguished from the undisturbed deposits and fortunately most of the areas within Tabon Cave which were inhabited by man were not disturbed by the *Megapode* and all C-14 samples were taken from undisturbed deposits.

*Time and Cultural Sequences in Tabon Cave.*—The Excavations in Tabon Cave, as pointed out by Shutler (1965: 1), have clearly established the presence of Pleistocene Man in the Philippines. The excavations have revealed, as noted, six areas and levels in the cave which have Palaeolithic assemblages, and four of these have been dated by C-14 determinations. There are undoubtedly other assemblages for the cave was inhabited, as well as frequented from time to time, for tens-of-thousands of years. And excavation have not yet been made in the deepest levels of the cave.

The habitation levels are comprised almost entirely of flakes of chert which were a product of a direct *percussion* flake industry. These distinct habitation areas have been designated as "Flake Assemblages" and each distinct assemblage distinguished with a Roman numeral—Flake Assemblage I through Flake Assemblage V. When the excavations are completed and the flake assemblages linked by detailed profiles which show their precise stratigraphic relationships, it may be necessary to modify the designations of the assemblages and components.

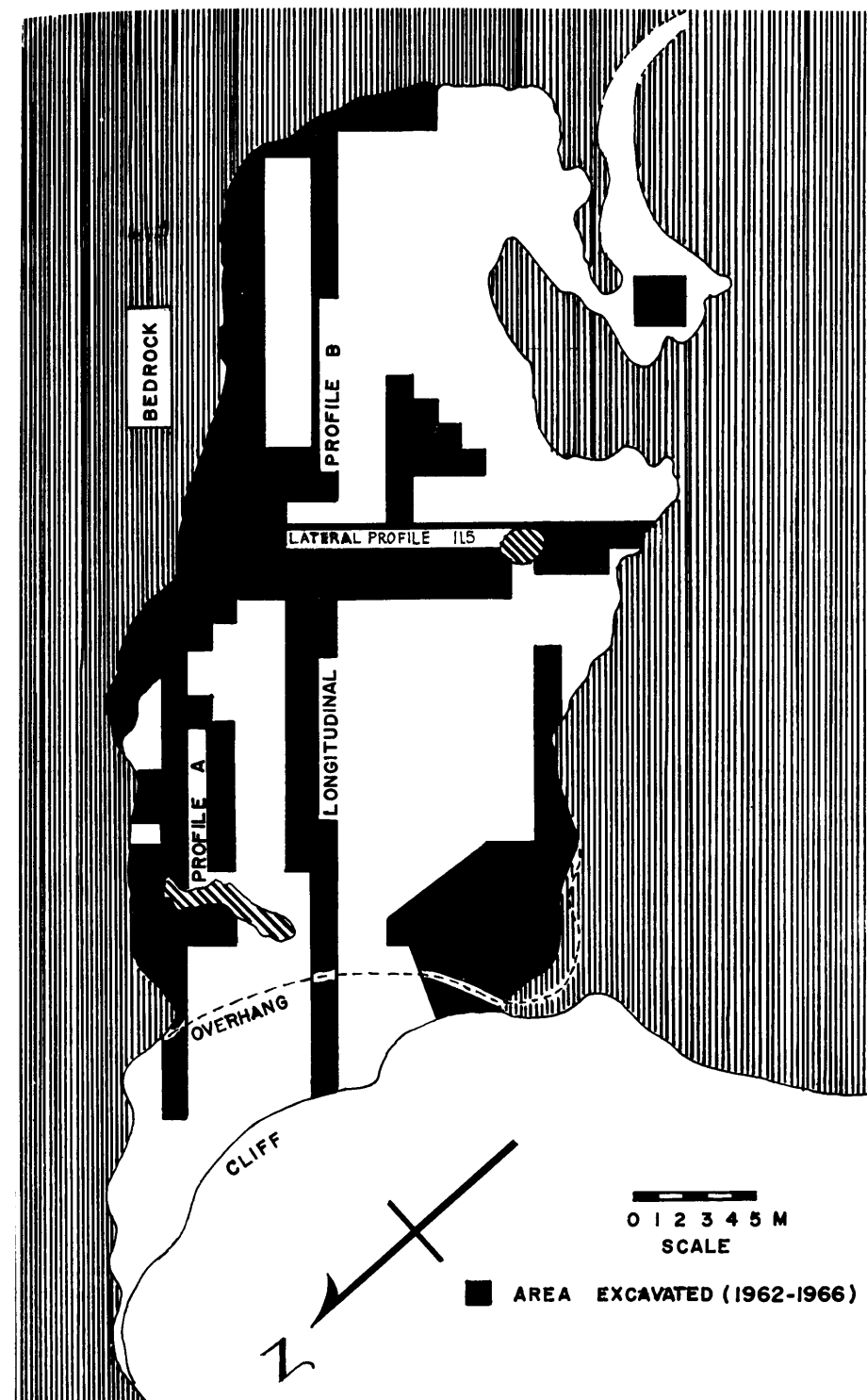


Fig. 6. Floor plan of Tabon Cave with areas excavated indicated by dark shading.



Less than thirty-five per cent of the shallower levels of Tabon Cave have been dug (Plts. VI and VII). The major phase of the work in Tabon Cave still lies ahead, for the deepest levels with the promise of finding truly ancient remains of man have not been excavated. The maximum depth of the deposits in Tabon Cave is not known, as noted, but it is estimated to reach at least six meters. One probe, two meters in depth, proved to be sterile at the deepest level, but the areas of caves which were inhabited or only temporarily occupied are often highly dispe sed. Tabon Cave, for example, is extremely rich in flake industries at some levels but sterile in other areas at the same depth. The six flake assemblages which have been revealed by the excavations to date in Tabon Cave are set forth in Table III. This Table provides the C-14 determinations for the flake assemblages or their estimated ages as based upon a rough "depth-and-age" equation of the rate of deposition of the guano and human debris; the number of the radiocarbon determination used by the institute of Geophysics, University of California at Los Angeles; and the depth of the charcoal sample below the present surface of the cave. The relationships between the depth and the age of the C-14 determinations are highly consistent.

Table III

THE FLAKE ASSEMBLAGES FROM TABON CAVE

Flake Assemblage	Depth Below Present Cave Floor	Estimated Age or C-14 Date	UCLA C-14 Number *
I-A	Surface to approx. -25 cm.	8500 to 9500 (estimated)	
I-B	-20 cm.	9250±250 B.P.	UCLA-284
	-50 cm. to -70 cm. (to + 50 cm.)	>21,000 B.P. (maximum age)	UCLA-285
III	-97 cm.	>22,000 B.P.	UCLA-288
	-99 to -109 cm.	23,200±1000 B.P.	UCLA-699
	-106 to -115 cm.	>22,000 B.P.	UCLA-283
IV	-121 cm.	30,500±1100 B.P.	UCLA-958
V	-160 cm.	45,000 to 50,000 (estimated)	

\* Sources: (Ferguson, G. J. and W. F. Libby 1963) and (Berger, Rainer and W. F. Libby (1966).

FLAKE ASSEMBLAGE I-A

The most recent excavations have revealed what is probably the youngest flake tool assemblage in Tabon Cave, tentatively identified as Flake Assemblage I-A, and its upper age estimated as dating from about 8500 to 9500 years ago, possibly more recent. This extensive flake assemblage was excavated in a relatively shallow deposit along the right wall and about mid-way back into the cave. Flakes were found on the present surface and were encountered to a maximum depth of about 25 cm., in a fine soft, gray-brown deposit. A hard limestone floor, which varies considerably in depth, lies directly beneath this assemblage. Beneath this floor still another assemblage was discovered, the stratigraphic relationship of which is still uncertain. This lower assemblage has been tentatively related to Flake Assemblage III although it might be a distinct flake assemblage.

The flakes of Assemblage I-A were found scattered around a number of large fallen stalactites. Round limestone rocks in this area had clearly been used as anvils for flaking tools. This rich habitation area has yielded the first large numbers of animal bones and teeth which will allow for the identification of the more recent animals hunted by the Tabon inhabitants. Many of the bone fragments are fossilized. The excavations in this area also yielded the first association of a mineralized fresh water riverine shell, a type called *suso* (Family *Melaniigae*) which is still being eaten by the people in Palawan and throughout the Philippines. No marine shells were recovered. Excellent charcoal samples have been obtained for dating at least the maximum age of this assemblage.

FLAKE ASSEMBLAGE I-B

This localized assemblage was dated by C-14 to 9250±250 B.P., and would appear to represent only a brief period of "frequentation" of Tabon Cave. The area occupied, as presently defined, was limited to a very small section mid-way back into the cave and on the left side facing into the cave. The stratigraphic relationships between Flake Assemblage I-B, II, and III, IV, and V may be seen in Figures 9 and 10. It is possible, although unlikely, that this assemblage is linked through time with Flake Assemblage II, the latter being estimated as dating from about 10,000 to 20,000 years ago. Further excavations will clarify the relationships of Flake Assemblages I-B and II.

The C-14 determination for Flake Assemblage I-B is highly provocative, for in the absence of associated marine shells, it

would indicate the presence of a land shelf in this area to 9250±250 years ago. The level of the sea 9000 to 10,000 years ago according to Fairbridge (1962), would be 30 meters below the present level, producing an extensive land shelf along this area on the west coast of Palawan. There is thus a close correspondence between the C-14 date and the absence of marine shells in Tabon Cave, and Fairbridge's (1960 and 1962) studies of the changing sea level during the Late Pleistocene.

#### FLAKE ASSEMBLAGE II

This flake assemblage and habitation area was found on the left side of the cave near the mouth to about mid-way back into the cave. Tools of this assemblage were recovered lying on the surface when Tabon Cave was first discovered, for near the mouth of the cave the upper levels of the deposit which contained Flake Assemblage II had been eroded away. The erosion is clearly revealed by the flaring lips of stalactites and two chert flakes which are *embedded* in a stalactite 50 cm. above the present surface of the cave. It has thus been possible to reconstruct the former level of the ancient floor in this area of the cave, as well as the original thickness of the cultural strata which contained Flake Assemblage II (see Fig. 9). The maximum thickness of the remaining deposit of Flake Assemblage II varies from approximately 50 cm. to 70 cm.

The deposit containing Flake Assemblage II is highly distinctive, being dark brown in color, hard and granular, and pitted with the nests of mud-dauber wasps (*Vespa* spp. and *Chlorion haemerhoidalis*). The insects collected in Tabon Caves have been graciously identified by Mr. Romualdo Alagar of the National Museum. The deposit contained hundreds of pieces of chert representing all stages in the manufacture of flake tools, as well as many small fragments of fossil animal bones, human and animal teeth, bits of charcoal, but no marine shells.

The base of this occupation level rests directly on a thick calcareous floor laminated with layers of hard travertine. This hard layer varies in thickness from about 20 cm. to a maximum of 50 cm. Charcoal associated with flakes of Assemblage II was found lying directly on top of this hard calcareous floor, 50 cm. below the surface. This charcoal yielded a C-14 determination of >21,000 B.P. and represents the maximum age of Flake Assemblage II as presently distinguished. Studies of the deposit of Assemblage II and detailed colored profiles show no apparent discontinuity, and it is presently concluded that the habitation period designated as

Flake Assemblage II was remarkably long, covering about ten thousand years or more. The distinctive physical features of Tabon Cave which provided an ideal habitation site for Ancient Man is vividly illustrated by the great duration of some of the periods of occupation of the cave.

Flake Assemblage II, as noted, lies directly above a thick calcareous floor which elsewhere in the cave may be traced as an ivory-colored layer. In general, the deposits beneath this floor are sterile, but in one area (see Fig. 9) flakes were found directly beneath this floor. These flakes, stratigraphically associated with Flake Assemblage III, were reached only after the workmen had chopped through the hard floor using crowbars and picks.

The presence of the hard and thick stratum between Flake Assemblages II and III may be of significance to palaeo-climatic studies, for it suggests a possible pluvial period in Palawan during the Late Pleistocene. Additional support for this view is provided by broad and flat stalagmites which were uncovered in the main lateral trench at exactly the same level as the hard stratum. Stalagmites of this type are formed only when there is a heavy water percolation and drip in the cave, such as would have occurred during a wet period of a glacial advance. The C-14 determinations for Flake Assemblages II and III, >21,000 and 23,200±1000 years respectively, provide approximate dates for the upper and lower limits of this wet period or at least a *period when Tabon Cave was wet and damp*. The maximum of the Last Glacial, as noted, is believed to have occurred 20,000 years ago (Fairbridge 1960 and 1962) which is precisely the period when the hard floor in Tabon Cave was formed as shown by the C-14 dates. It must also be pointed out, however, that the presence of this floor and the broad, flat stalagmites may be due only to local conditions and changes in the ceiling of the cave which would have allowed for a greater water drip in the cave. It has been suggested too that there is no necessary correlation between glaciation in the temperate regions with pluvials in the tropics. These are problems for the specialists.

#### FLAKE ASSEMBLAGE III

An extensive habitation level was encountered in the main longitudinal and lateral trench towards the middle and rear of the cave at depths which vary below the present floor from approximately 85 cm. to 115 cm., for the level dips down in the center of the cave. This habitation level is distinguished in most areas by a dark red-brown deposit which is relatively gritty and rich

in organic materials. There is often a hard dark red pan at the base of this stratum; clearly an ancient floor.

The habitation level of Flake Assemblage III contained many fragments of charcoal which were the product of scattered cooking fires (there were no true hearths in Tabon Cave); numerous soft, white bones of birds, bats, and small mammals; a very few fossil bones; and hundreds of pieces of chert which represent stages in the manufacture of flake implements. Basalt choppers—large nodules unifacially trimmed—were also excavated with Flake Assemblage III, as well as quartz and basalt hammers used in knapping the chert. Charcoal directly associated with this assemblage yielded two C-14 dates of "greater than" 22,000 years ago, and finally a finite date of  $23,200 \pm 1000$  B.P.

#### FLAKE ASSEMBLAGE IV

Flakes and many fragments of charcoal were also encountered in a restricted area of the main lateral trench at 121 cm. below the present surface. The flakes and charcoal of this assemblage, as presently established, form only a restricted and narrow band. The associated charcoal sample yielded a finite date of  $30,500 \pm 1100$  B.P. It will be possible to study in greater detail the extent and characteristic of this flake assemblage, as well as that of Flake Assemblage V, when the main lateral trench is enlarged. The flakes, cores, and flake tools recovered indicate, nevertheless, that the technique of flaking of this assemblage is identical with that of Flake Assemblage III which is discussed in detail below.

#### FLAKE ASSEMBLAGE V

The most recent excavations in the main lateral trench (shortly before the work was stopped) revealed three flakes of chert 160 cm. below the present surface, and 40 cm. directly below Flake Assemblage IV which has an associated C-14 date of  $30,500 \pm 1100$  years ago. The three chert flakes were in an absolutely undisturbed stratum and were scattered over a meter-square area at exactly the same depth. It is now planned to destroy the profiles of the main lateral trench, as noted, in order to extend and trace out the stratum which contained these flakes. The estimated age of this stratum—45,000 to 50,000 years ago—is highly conservative and it may well date to over 60,000 years. As tiny bits of charcoal are invariably associated with the flake assemblages, it is hoped that charcoal for radiocarbon determinations will be obtained when the 160 cm. level is enlarged.

*A Preliminary Description of Flake Assemblage III.*—Hundreds of lumps and nodules of chert, cores, waste flakes, primary flakes, as well as utilized flake, were found in the stratum which has been designated as Flake Assemblage III. Man not only lived in Tabon Cave but spent much of his time in the cave manufacturing suitable flake tools. The presence of numerous clearly defined workshops (Fig. 8) provides thus an opportunity for a preliminary description of the techniques of flaking used by the Tabon inhabitants (a detailed and comparative study of all of the Flake Assemblages will be presented in the final site report for Tabon Cave).

Chert, a hard cryptocrystalline quartz, is common in the nearby river beds of Quezon Municipality, providing Palaeolithic Man with a handy material for implements. Chert and related stones are not usually common elsewhere in the Philippines, except on the island of Panay, a factor which should be carefully considered when comparative studies are made of the types of tools used by Palaeolithic Man in the Philippines. Thus, core and pebble tools in Luzon might be the same age as flake tools in Palawan. The abundance of chert in Palawan undoubtedly accounts too for the notable scarcity in Tabon Cave of other types of stone or bone tools.

There has been no previous attempt to study flake tools recovered in archaeological sites found elsewhere in the Philippines. And, although flake tools are widespread in Southeast Asia, there is little detailed comparative information for the Upper Palaeolithic. Professor Beyer's collections include thousands of flakes recovered during his extensive surveys in Central Luzon. Whether or not these flake artifacts, possibly entirely from surface recoveries, can be organized into related assemblages for systematic study and comparison with the Tabon materials is doubtful. Without stratigraphic data, the chronological positions of the Luzon flakes are uncertain.

In addition, the method-of-manufacture of flake tools in the Philippines during Palaeolithic times did not yield readily recognized forms of tools that might be used in typological studies, the approach which Beyer used exclusively in establishing his lithic sequences and cultural chronology for the Upper Palaeolithic in the Philippines. Beyer (1947, 1948a, 1949) has provided a few illustrations of flake tools including type descriptions based upon inferred functions such as "arrow points." These descriptions, as

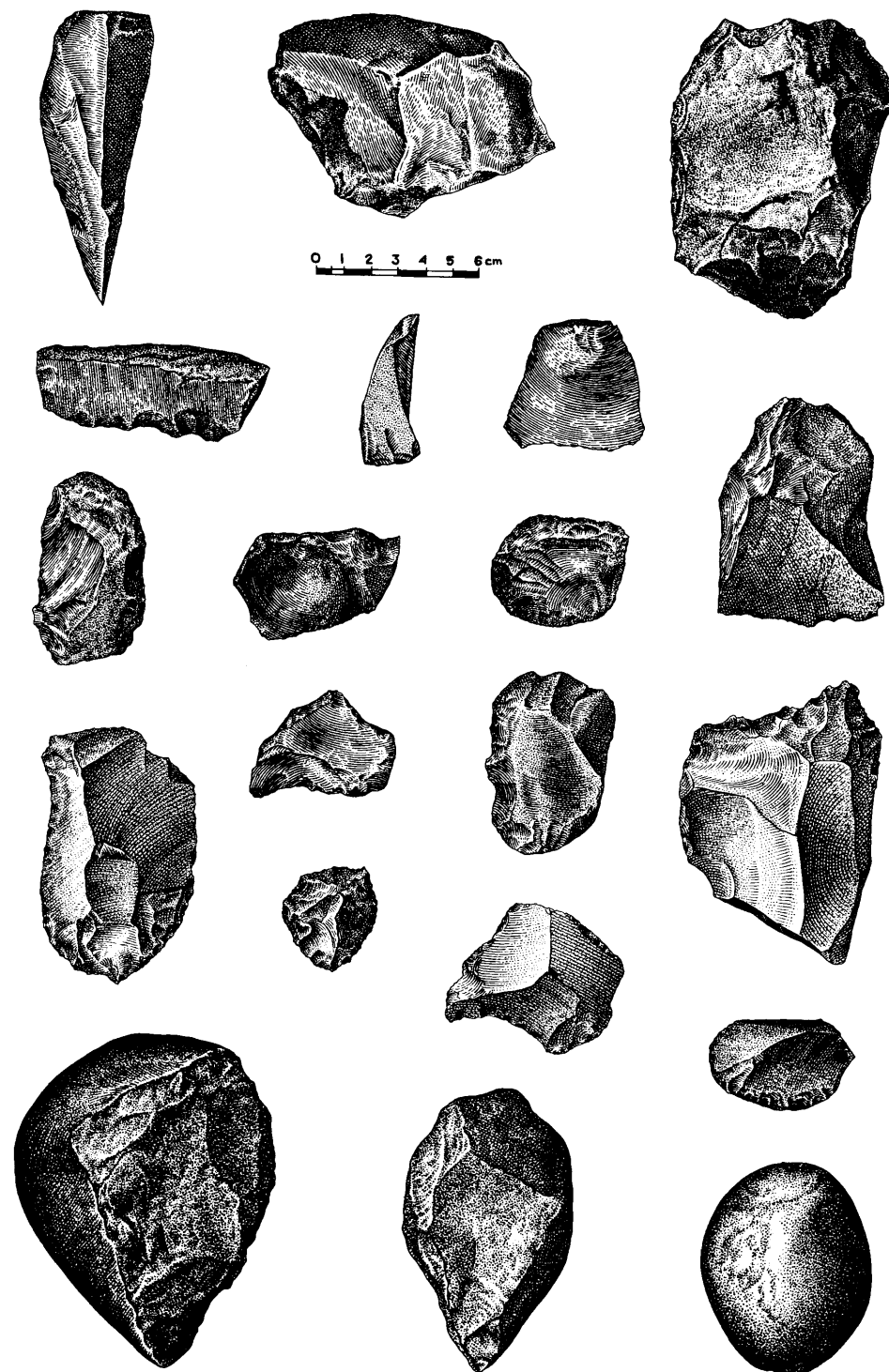


Fig. 7. Tools from Tabon Cave: (a-m) examples of flake tools associated with Flake Assemblage III; (n-o) basalt choppers; (p) quartz hammer stone.

the writer [Fox (1952) 273-276] has pointed out elsewhere, are highly subjective. In the past, the outer hard wood of palms and bamboos were more likely used as projectile points than stone.

The following preliminary description, in contrast, is based upon the technique of manufacture of the flake tools following closely the analyses of Shawcross (1964) for New Zealand flake industries, and Oakley (1950) for European materials. The studies of Shawcross are particularly valuable, for the technique of manufacture of some of the New Zealand (and Australian) flake assemblages and those of Tabon Cave fall clearly into a similar tradition. This preliminary analysis involves only a limited corpus of the chert of Flake Assemblage III; nodules, cores, waste flakes, primary flakes, and flake tools which were found at the same cultural level in an area 7 x 3 meters in size. A detailed study of all of the flake assemblages from Tabon Cave which involves thousands of pieces of chert will be presented in the final site report; nevertheless, preliminary comparisons show that a similar technique of manufacture of flake tools was used from the earliest period of occupation of Tabon Cave, as based upon the excavations to date, to the last. This flake tradition, moreover, persisted into post-Pleistocene times.

Briefly, the flake tools were produced by a percussion technique. Cores were achieved by directing oblique blows, using a stone hammer (Fig. 7-p), against the edge of a lump of chert, usually in the form of a river nodule or pebble, in order to obtain a flat surface—a "striking platform"—for subsequent knapping. Further blows were then directed against the edge of any potential striking platform of the core in order to obtain the sharp flakes. It is probable that cores were usually held in the hand when flaked. But waste flakes in unusually large numbers, as well as hammers, were found around flat limestone rocks which would indicate that the anvil method of flaking was also known.

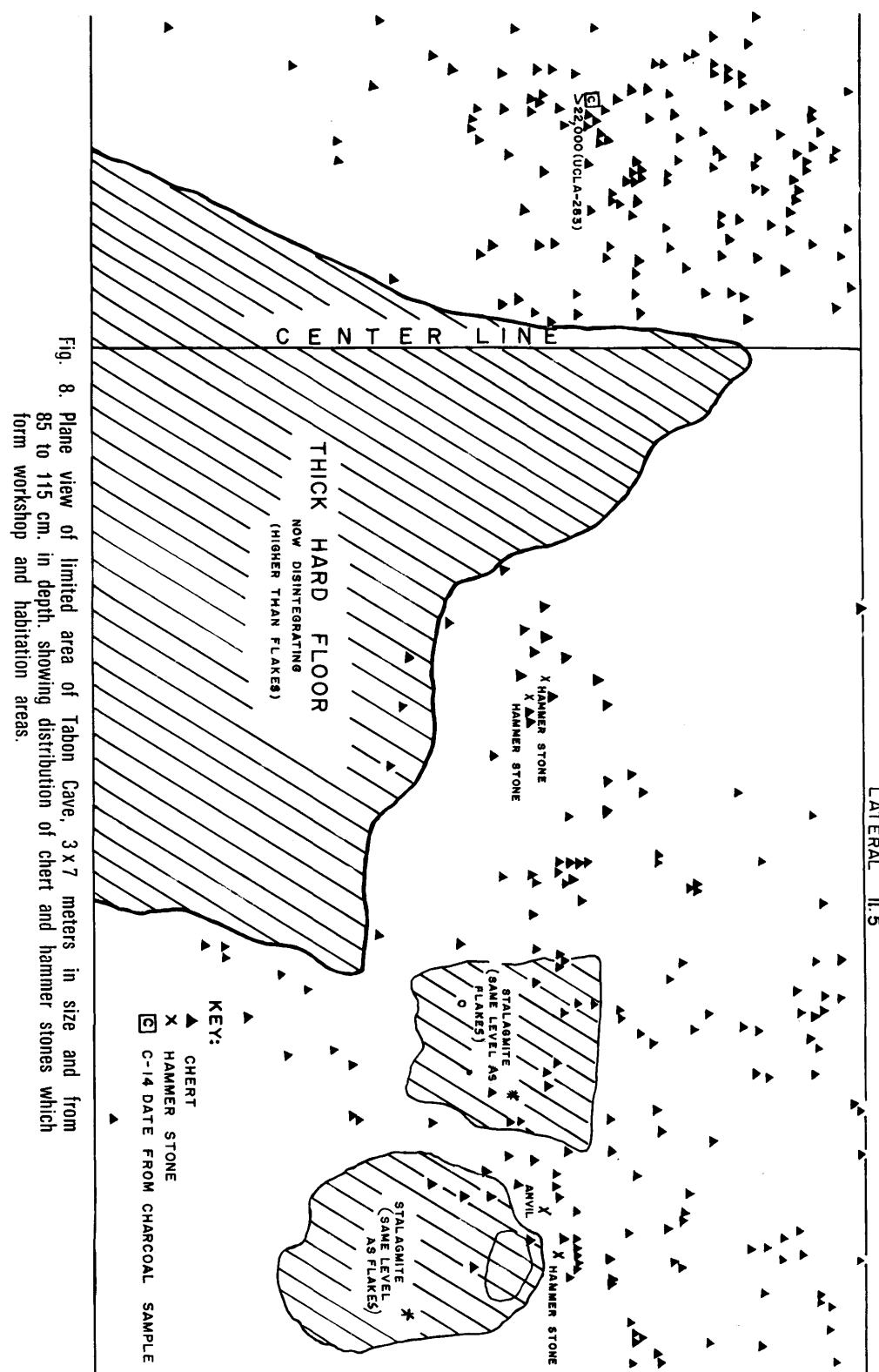
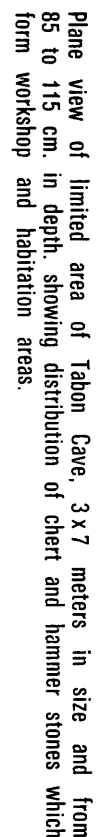
Flakes were not only struck from cores but also from any scar of a larger flake which would have provided a striking platform. In the course of the knapping of cores or the scars of large flakes, many flakes were obtained which were unsuitable for tools. These—the *waste flakes*—constitute (see Table IV) the largest category of the pieces of chert found in Tabon Cave. Some of the unused flakes are similar in form and size to the flake tools but show no evidence of use. These flakes, described herein as *primary flakes*, were apparently potential tools which were simply

It must be stressed, as discussed by Shawcross (1964: 10) in his analysis of the flake assemblages of New Zealand, that the forms and sizes of the primary flakes and utilized flakes of the Tabon flakes were not predetermined by the flaking technique. For, there is no evidence of core preparation or the shaping of cores which would have allowed for uniform sizes and shapes of flakes, as in the types of Late Neolithic blade tools excavated in the Bato Caves of Sorsogon Province (Fox and Evangelista 1957a). The long, thin, and uniformly shaped blade tools of the Bato Caves could have been obtained only by careful core preparation. In contrast, the cores of the Tabonian flake industry are irregular in size and shape and consequently the forms of the primary flakes and utilized flakes show great variation.

Utilized flakes, as noted, do not have distinct and recurring forms. Preliminary analyses suggest, however, that flakes with secondary retouching form a limited number of tool-types, such as rounded end-scrapers, concave scrapers, round humpback-like scrapers, and so forth. It is also possible that secondary retouching was also used simply to reedge tools dulled by use; not to achieve preconceived forms. The site report for Tabon Cave will also include a thorough typological study of flake tools with secondary retouching.

The technique of manufacture used by the Palaeolithic inhabitants of Tabon Cave, in short, produced highly variable sizes and forms of flake tools. The early attempts by the writer to employ the usual typological classification and description were singularly frustrating and finally abandoned. The final site report on Tabon Cave, as noted, will continue to stress the study of the technique of manufacture of the flake tools as the basis for description and classification, following the highly pertinent studies of Shawcross. Few other details of this flake tradition, which has been given the name of *Tabonian*, can be presented at this time.

Table IV provides a classification for 337 pieces of chert which were excavated in an area 7 x 3 meters in size and in a layer which varies in depth from 85 cm. to 115 cm. below the present floor of Tabon Cave. These comprise only a limited quantity of



the chert associated with Flake Assemblage III. A plane view of the distribution of these 337 pieces of chert is shown in Figure 8 which clearly defines workshop areas. The stratigraphic position of Flake Assemblage III is shown in Figures 9 and 10.

Table IV

A SAMPLE CLASSIFICATION OF CHERT AND THEIR PERCENTAGES OF FLAKE ASSEMBLAGE III

Classification	Percentages
(1) <i>Unaltered Lumps of Chert</i>	2
(2) <i>Cores</i>	22
(3) <i>Waste Flakes or Materials</i> (angular lumps or flakes of chert which were a product of flaking but too small to form either cores for further flaking or too small and irregularly shaped for use as tools)	53
(4) <i>Primary Flakes</i> (potential tools but showing no evidence of use)	6
(5) <i>Flake Tools</i>	16
(6) <i>Flake Tools with Secondary Retouching</i>	1
	—
	100%

During the archaeological field school of the University of the Philippines and the National Museum held at Tabon in June, 1965, ten students excavated 112 pieces of chert in another area of Flake Assemblage III. Statistics for the classes of chert excavated by the students which represent stages in the manufacture of flake tools, as well as the number of flake tools, are similar to those of Table IV: cores, 23 per cent; waste flakes, 50 per cent; primary flakes, 3 per cent; utilized flakes, 19.5 per cent; and flakes showing secondary retouching, 2 per cent. No unaltered lumps of chert were recovered during the student excavations.

The small number generally of unaltered lumps of chert found in Tabon Cave would suggest that the Palaeolithic people performed preliminary dressing of the lumps of chert near to where the chert was recovered in the river beds. The chert of the different flake assemblages also vary in color; the chert of Flake Assemblage III tending to be light in color and the later assemblages brown or red-brown. Of course a range of colors of the chert are associated with each flake assemblages. These variations

in the color and grade of the chert might suggest, however, that the successive inhabitants of the cave had specific collecting stations where the raw materials were gathered or favored particular colors of chert for their tools.

No systematic study has been made as yet of the cores, a highly important task in view of the fact that the shapes of flake tools are influenced by the forms of the cores. It may be stated with confidence, nevertheless, that core preparation was absolutely minimal and that they are irregular in form and vary considerably in size. There are also no diagnostic core tools, the chert artifacts being comprised wholly of flakes or flake-core tools. Flake tools occur which may show the cortex or skin of the original nodule, but typically the tools show flaking on all or most surfaces. Blade tools, as would be expected when there was no core preparation, are entirely absent; although a few flakes have blade-like forms.

Diagrams will be presented in the site report, following Shawcross (1964), which will illustrate the proportions of the flake tools, the thickness and angle of the striking platforms, and so forth, as well as studies of the use of flakes as shown by binocular examinations. At present, it may be stated only that the range in length of the flake tools (sample of 56 from Flake Assemblage III) varies from 3.5 cm. to 11.6 cm., with 80 per cent being more than 5 cm. in length (length was measured perpendicular to the striking platform). The largest utilized flakes would appear to have been used as chopping or hacking implements and the others as scrapers of various forms, cutting tools, and so forth.

*The Absence of Sea Shells in Tabon Cave.*—The excavations in Tabon Cave have been made entirely with trowels, ice picks, and paint brushes, and the deposits have been sifted with fine wire

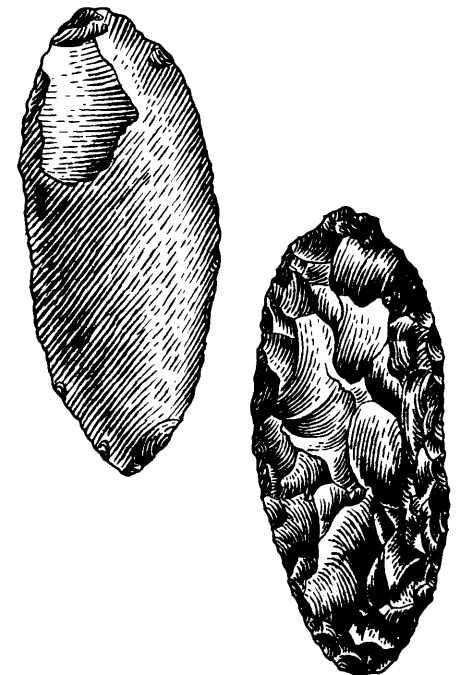


Fig. 11. Flake tool surface recovery from Sidangan, Zamboanga del Norte, showing a highly developed secondary flaking not found in the Tabonian tradition. (Courtesy of Father Jaime Neri.)

mesh. The extreme caution observed during the Tabon excavations may be illustrated by the recovery of hundreds of tiny chips of chert (not counted in the statistical analyses) which flew off when the chert was being knapped. Nevertheless, *not one single marine shell* has been found in Tabon Cave in association with any of the flake tool assemblages. The total absence of sea shells cannot be attributed to disintegration accelerated by the pressure of the deposits, for many small and fragile bones of bats and birds were found in the deepest cultural levels. Surface and sub-surface flake assemblages also have no marine shells. Thousands of sea shells, in addition, are encountered in other caves associated with ancient flake assemblages which date to 7,000 years ago.

The only conclusion which the writer can reach regarding the total absence of marine shells in Tabon Cave is that the cave was inhabited during periods when land shelves were exposed in the shallow seas fronting Tabon Cave. Mr. Inocentes Paniza, Geologist of the National Museum, who excavated Tabon Cave with the writer, is of the opinion based upon a fathometric study that the sea shore was some 30 to 35 kilometers distant from Tabon Cave during most of the time that the cave was occupied by man (see Fig. 2). Recent studies of the changing absolute sea level during the Late Pleistocene, to be discussed below, support this view. During the Late Pleistocene, the sea coast was undoubtedly too far for the Tabon Cave dwellers to have gathered shellfish and brought them back to the cave to eat, although foraging trips to the sea coast may well have been made. The maximum distance that marine shells have been found in Palawan cave sites of post-Pleistocene date by the Museum's field teams is in the Kalatagbak area (Fig. 5), approximately 15 kilometers from the coast over difficult terrain and a six to nine hour's hike depending upon the weather and the condition of the trails.

*Animal Bones from Tabon Cave.*—No animal bones were found in the limited area, as presently defined, of Flake Assemblage I-B. Many fragments of mineralized animal bones, however, were recovered in the habitation levels of Flake Assemblages I-A and II. The animal bones with Flake Assemblage III and IV, as noted, were largely those of small birds, bats, and animals. There have been surprisingly few bones of larger animals recovered with the flake assemblages except those of the pig and an "extinct" deer (the teeth and highly fragmentary bones of other animals have not been identified).

The deer is not found on Palawan Island today, forming one of the major zoological mysteries of the Philippines. Now, at least, it is known that the deer was present. Excavations in other Palawan caves supported by C-14 determinations indicate that the deer survived until about 4,000 years ago. There are no evidence as to why it disappeared. The writer suspects that this deer was a small form, as judged by antlers recovered, and related to the species still found on the Calamianes Islands directly to the north of Palawan Island.

A number of Bornean and Western Malayan mammals are also common to Palawan and the Calamian Islands but are unknown elsewhere in the northern Philippines. Among these are: the "Scaly Anteater" (*Paramanis javanica*), the "Slow Porcupine" (*Theromys pumilus*), the Mongoose (*Mungos sp.*), the so-called "Skunks" (*Suillotaxus Marchei*), and a few others. The evidence of biologic distribution (Dickerson 1928) would suggest that these animals, uncommon in the Philippines, were relatively recent immigrants into Palawan when a land bridge still connected Palawan and Borneo, but after the land connections between Palawan, the Calamian Islands, Mindoro, and Borneo had disappeared. The relationships between Borneo and Palawan of plants and animals is extremely close, and it is certain that future archaeological work will show even more intimate historical ties, biological and cultural, between these two areas.

It is also certain that extensive use was also made by the ancient inhabitants of Tabon Cave of wild plant foods, for they were food gatherers and hunters. But evidences of the use of plant foods have not survived and are not reflected in the archaeological record. The people in the Philippines who live at lower technological thresholds, such as the Pinatubo Ayta ("Negrito") of Zambales (Fox 1952), have a phenomenal knowledge of wild food plants—fruits, tubers, edible flowers and leaves, piths of palms, ferns, and so forth.

*Bone Tools.*—The excavations in Tabon Cave have not yielded a single tool made of an animal (or human) bone. The great quantity of readily available chert may explain the absence of bone tools in Tabon Cave. The Great Cave in Niah, Borneo, on the contrary, has yielded a sizable quantity of bone artifacts in all but the deepest levels. Their presence in Borneo may be explained in part by the difficulty of obtaining workable hard stones for tools [Harrisson and Medway (1962) 360]. Bone artifacts are notably scarce, in fact, in all of the Palawan cave sites regardless of their age.



*Tabon Man.*—During the initial excavations of Tabon Cave, June and July, 1962, the scattered fossil bones of at least three individuals were excavated, including a large fragment of a frontal bone with the brows and portions of the nasal bones. These fossil bones were recovered towards the rear of the cave along the left wall. Unfortunately, the area in which the fossil human bones were recovered had been disturbed by Magapode birds. It was not possible in 1962 to establish the association of these bones with a specific flake assemblage, although they were provisionally related to either Flake Assemblage II or III. Subsequent excavations in the same area now strongly suggest that the fossil human bones were associated with Flake Assemblage III, for only the flakes of this assemblage have been found to date in this area of the cave.<sup>3</sup> The available data would suggest that Tabon Man may be dated from 22,000 to 24,000 years ago. But, only further excavations in the cave and chemical analysis of human and animal bones from disturbed and undisturbed levels in the cave will define the exact age of the human fossils.

The fossil bones are those of *Homo sapiens* (Fig. 12). These will form a separate study by a specialist which will be included in the final site report for Tabon Cave. It is important to point out, however, because of a recent publication (Scott 1969), that a preliminary study of the fossil bones of Tabon Man shows that it is above average in skull dimensions when compared to the modern Filipino. There is no evidence that Tabon Man was "...a less brainy individual..." [Scott (1969) 36]. Moreover, Scott's study includes many mistatements about the Tabon Caves, always the problem when writers work from "conversations."

*Some Geologic Events of the Late Pleistocene and the Upper Palaeolithic.*—There have been no detailed geological or palaeoclimatic studies of the Late Pleistocene (or of the Pleistocene Epoch) in the Philippines. It is necessary to turn to other regions for relevant geological data, specifically to Europe and Africa where in recent years there have been extensive studies made of the geochronology of the Late Pleistocene which are supported by many C-14 dates [Movius (1960); De Heinzelin (1963). Lin's (1963) recent data for Taiwan and Fairbridge's (1960 and 1962) general descriptions of the Late Pleistocene and changes in absolute sea

<sup>3</sup> It is necessary to point out for those engaging in work in limestone caves in the Philippines that fossilization is not necessarily a criteria of great age. Mineralized human bones have been found on the surface of Manunggul Cave, Chamber A, with a jar burial assemblage which is dated by radio-carbon to only 710-890 B.C.

level are also highly pertinent. As water seeks its own level, data from studies of eustatic changes made elsewhere in the world are valid for a general picture of the changing sea level in the Philippines during the Late Pleistocene.

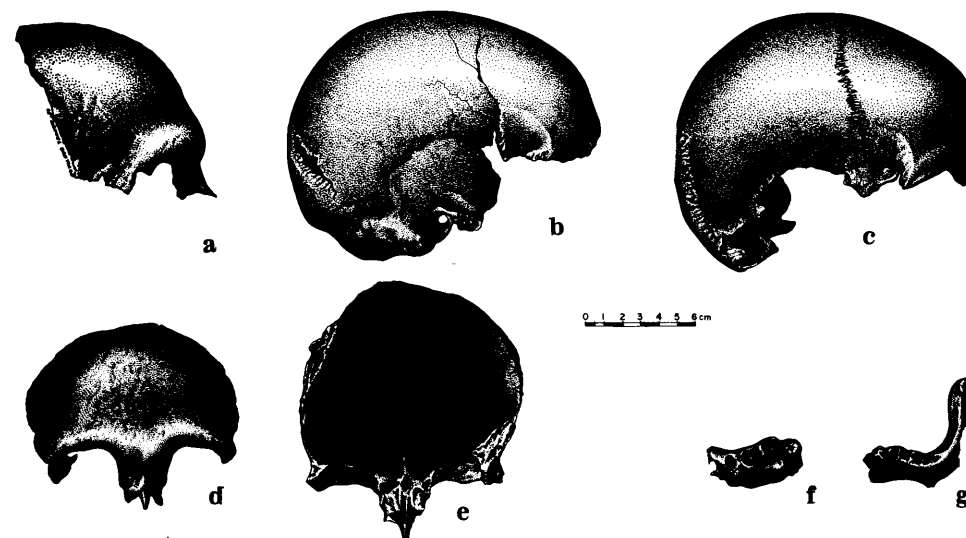


Fig. 12. Fossil human bones from Tabon Cave: (a-d-e) Lateral, frontal, and ventral view of "Tabon Man" tentatively dated to 22-24,000 B.P. (b) Late Neolithic skull from Manunggul Cave, 710-890 B.C. (c) Early Metal Age skull from Bato Puti Cave; (f-g) fossil mandibles of two individuals from Tabon Cave.

The lowering of the sea level during the Pleistocene, as a result of great quantities of the water of the world being enveloped in the building up and advances of the ice sheets and glaciers, exposed continental shelves and formed land bridges by which man, as well as animals and plants, drifted from the mainland of Asia [see Movius (1948) Map 2] into the Island World of Southeast Asia and the Philippines. Flint (1953: 437) estimates the lowering of the sea level during the Last Glacial—the period of the Pleistocene under consideration herein—as between 70 and 102 meters "... less an uncalculated amount attributable to isostatic adjustment." Fairbridge (1962:113) with newer data points out: "The last glacial maximum was about 20,000 years ago and [the] sea level was about 100 meters below the present. Rapid melting began about 16,000 B.P. and by 6,000 B.P. the present level was reached." A drop of 100 meters would have allowed Late Pleistocene man to move into Palawan by the use of crude rafts, as well as into the rest of the central and northern Philippines (see Fig. 2 which shows the 50 fathom shelf surrounding Palawan). The channels which separated the many islands in Palawan during the Late Pleistocene were very narrow (e.g., only 8 to 9 klms. between Borneo and Balabac).

The Glacial advances may have been correlated too, as noted, with climatic changes in the low latitudes, such as in the Philippines. A dramatic rise in the sea level above the present level also occurred at the time of the final regression of the Last Glacial. Thus, about 6,000 years ago, the sea rose to 3 or 4 meters above the present level flooding extensive lowland areas (Fairbridge 1962). The history of Ancient Man in the Philippines is therefore intimately linked with the geological developments of the Late Pleistocene, and further studies of the Philippine Pleistocene are critically needed before movements of man into the Islands are thoroughly understood.

The flake assemblages of Tabon Cave represent, as noted, one Palaeolithic flake tradition which also persisted into the post-Pleistocene; in fact, to 4,000 years ago as shown by a C-14 date from Guri Cave (see below). Movius (1958: xiii) states: "Tentative conclusions, mainly based on the results of C-14 measurements, suggest that the upper limit of the Palaeolithic in Borneo should be placed at approximately 17,625 B.C." Harrisson (1964: 183), in a more recent summary, has provided the following tentative cultural chronology for Niah: (1) "tiny flakes" of the Middle Palaeolithic, 45,000 B.C. (plus); (2) "mid-Sohan" flakes of the Middle Palaeolithic, 35-45,000 B.C.; (3) "chopping tools and large flakes" of the Upper Palaeolithic, circa 30,000 B.C.; (4) "small flakes of the Upper Palaeolithic," 25-30,000 B.C.; and "advanced flakes of the Palaeo-Mesolithic (?)," about 10,000 B.C.

Harrisson's "chopping tools and large flakes" would appear to be equivalent with the Tabonian flake tradition, and possibly his "small flakes" of the Upper Palaeolithic, 25,000 to 30,000 B.C., could also be linked with the Tabonian tradition. At Tabon there is possibly a trend towards smaller flake tools in the upper levels (no statistical studies have been completed however), and apparently more frequent secondary retouching of flake tools in the late Upper Pleistocene and early post-Pleistocene times. There are, nevertheless, flake tools with fine secondary retouching in the deepest levels of Tabon Cave and tools range from large to small at all levels.

The Palaeolithic industries of Palawan may have survived to a more recent date than in Borneo, reflecting in part the greater marginality of Palawan and the Philippines in general. There is no evidence from Palawan or elsewhere in the Philippines, as yet, of distinctive "Mesolithic" or "Palaeo-Mesolithic" tool traditions which would justify the designation of a "Mesolithic" period.

Moreover, I strongly suspect that Palaeolithic flake technologies will also be found in Borneo and elsewhere in Southeast Asia in post-Pleistocene sites. As Heine Geldern (1945: 130) notes: "The Mesolithic cultures of Indonesia are really late Palaeolithic cultures which flourished during the first millennia of the present geological period."

There have been no systematic excavations elsewhere in the Philippines of an Upper Palaeolithic site. Beyer (1948a: 80), basing his conclusions upon extensive archaeological surveys in Bulacan, Rizal, and Batangas Provinces, recognized some "Late-Pleistocene (about 50,000 to 20,000 years ago) artifacts," described as palaeoliths, which were "...chiefly of flint, chert, and quartzite, but with a few thickly patinated or corroded medium large implements of obsidian. Mostly [entirely?] surface finds and no positive implement bearing strata identified as yet." Beyer has also illustrated some "Late Pleistocene Palaeoliths" (1947: Fig. 3) and "Late-Palaeolithic or Mesolithic" implements (1948a: Fig. 5) from Luzon which may well be chronologically and typologically related to the Tabonian tradition. However, there are no valid means by which the Luzon and Palawan flake tools can be compared, as earlier noted, for the Luzon recoveries are surface finds. There are, in fact, no stratigraphic evidences to establish even a relative time sequence for the Luzon flake implements.

Beyer's typological distinction between "Palaeoliths" and "Mesoliths" was apparently based upon a preconception that *larger* stone tools which he describes as handaxes, "choppers," "cleavers," or simply "palaeoliths," were Palaeolithic; while the *smaller* flake tools, such as those which have been excavated in Tabon Cave, were "Mesolithic." It is widely recognized (Movius: 1948), on the contrary, that flake tools formed a significant element of the chopper-chopping tool tradition in even the Lower and Middle Palaeolithic of South and East Asia.

It is also apparent from the excavations in Palawan that flake industries comprise the *major lithic tradition* during the Upper Palaeolithic of this area. The writer is convinced too that further systematic excavations in the Philippines and in Southeast Asia in general, notably in those regions where cryptocrystalline quartzes are available, will reveal other widespread flake tool industries of the Upper Palaeolithic; and already flake implements like those of the Tabonian tradition have been reported from Laguna Province in Luzon, and from Panay and Bohol Islands, as well as later, secondary flaked implements from Zamboanga (Fig. 11).

*Homo sapiens* is unquestionably of great antiquity in Asia. The Niah skull is securely dated to about 38,000 B.C., being "...much the earliest *Homo sapiens* ('modern man') found so far East" [Harrisson (1964) 179]. Tabon Man may be tentatively dated to about 22,000 to 24,000 years ago. The controversial Keilor cranium found near Melbourne, Australia is claimed to date to about 16,000 B.C. [Shutler (1965) 2; McCarthy (1961) 147]. The writer believes that the first *major* movement of *Homo sapiens* into the Philippines occurred with the exposure of the Sunda Shelf during the Last Glacial beginning, according to various estimates, some 45,000 to 55,000 years ago. The land bridge of the previous Riss Glacial, estimated as terminating between 100,000 to 130,000 years ago, would appear to be too early for any significant movements of Modern Man into the Islands at that time.

Further excavations in Tabon Cave and other areas of Palawan during 1969-70, the receipt of additional C-14 dates, and more detailed geochronological studies of the Quezon area and the rest of Palawan will greatly help to clarify the geologic events of the Late Pleistocene in Palawan and their relationship to the Upper Palaeolithic cultures. Mr. Inocentes Paniza of the National Museum, in fact, is planning future geological research in Palawan in 1969-70 with Mr. Jonathan Kress of Yale University who will also renew excavations of key cave sites and of Tabon Cave itself. Plans are also being made to begin palaeoclimatic studies of the deposits in Tabon Cave and other sites through the cooperation of Dr. Richard Shutler and others.

*Jar Burial in Tabon Cave.*—When first discovered, this cave provided a breath-taking sight with large fragments of at least 200 jars, jar covers, and smaller vessel scattered on the surface and in the holes of *tabon* birds, particularly along the left wall and towards the center and rear of the cave. Excavations in the sub-surface levels of Tabon Cave also yielded jade and stone beads, bracelets, earrings, a few glass beads, and bronze, but no iron. Thus, Tabon was a great burial cave during the Early Metal Age, approximately 200 B.C. to 500 B.C. The pottery and associated artifacts from Tabon Cave will be discussed below in relationship to the jar burial assemblages found in many other Palawan jar burial sites.

## CHAPTER III

### GURI CAVE:

#### A Post-Pleistocene Habitation Site with Upper Palaeolithic Flake Assemblages and a New Lithic Technology

*Description of Guri Cave and the Excavations.*—Guri Cave is perhaps the most attractive cave on Lipuun Point, being composed of numerous chambers and winding passageways at various levels (Fig. 13) which are rich with grotesque limestone growths—fluted and fan-like stalactites, stalagmites, and travertine terraces. The mouth of the main entrance chamber faces north east and is approximately 75 feet above the sea level. The slope in front of the cave to the edge of the bay is gradual. In addition to the main entrance chamber which was occupied during the early post-Pleistocene period by people using flake and later flake and blade tools, there are three other entrances into the cave at higher elevations. Pottery and artifacts of more than one jar burial assemblage were found on the surface and in the sub-surface levels of all of the four entranceways, as well as in two dark interior chambers.

Chamber B, shelf-like in appearance, contained an early jar burial assemblage related to the Tabon jar burial complex, and was completely excavated and screened. Preliminary excavations were also made in the main entranceway of Chamber A (see Fig. 13) where flake and flake and blade assemblages were encountered in a midden composed of thousands of marine shells. Excavations of Chamber A which are of great importance to the cultural chronology of the Tabon Caves will be completed in 1970-71. All statements at this time concerning the lithic assemblages are thus highly tentative.

*Time and Cultural Sequences in Guri Cave.*—The exploratory excavations in Guri Cave have revealed two major periods during which the cave was utilized by man:

- (1) Occupation of the main entranceway during the early post-Pleistocene period, after the sea had assumed more or less its present level. The midden was formed, it is estimated, during the period from about 5000 B.C. to about 2000 B.C. [one C-14 date of  $4070 \pm 80$  B.P. (UCLA 698) was received for marine shell 60 cm. below the present surface]; and

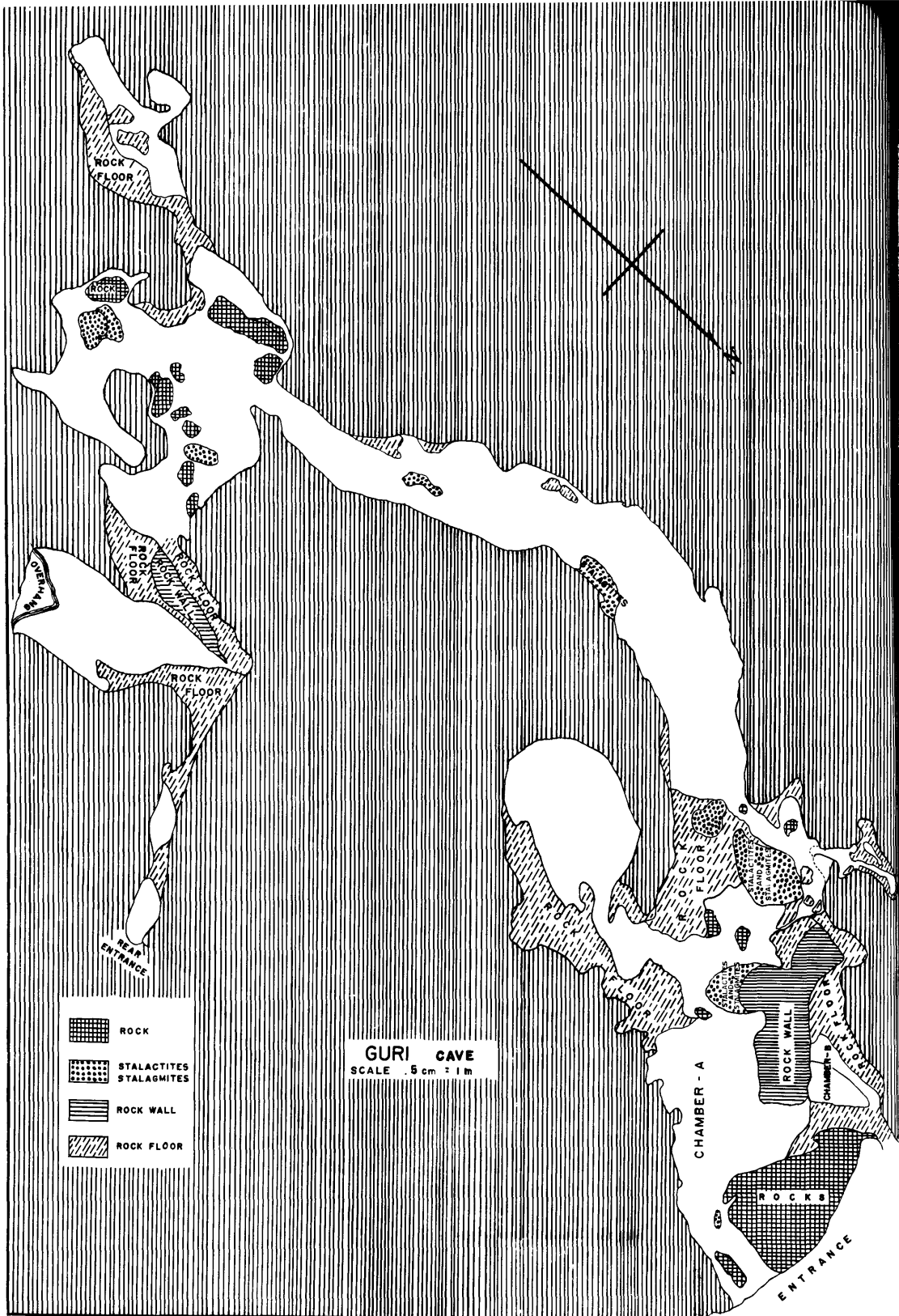


Fig. 13. Floor Plan of Guri Cave....

- (2) A jar burial assemblages which, as based upon the present data, began during the Early Metal Age, about 300 to 500 B.C., plus others of a later date.

The initial excavations in Chamber A during the summer of 1962 revealed a thick shell midden containing flake implements (Fig. 14) at all depths and blade tools in the upper levels, as well as many bones of animals including the wild pig and deer. The chamber is penetrated by sunlight and dry throughout, forming an excellent habitation site. A trench, one meter wide, was dug in the center of the mouth of the cave and extended six meters into the cave, revealing a great wealth of artifacts and human debris. Due to the pressure of work in other cave sites, only the shallow levels of the main longitudinal trench were excavated except for one square which was dug to a hard floor 60 cm. below the present surface. It is not known as yet whether this hard floor is bed rock or merely the continuation of a travertine terrace which flows down into the rear of Chamber A.

Only a few artifacts were found in the shallower deposits of the test square—although elsewhere in the trench there are many artifacts in the upper levels—but directly above the hard floor there was a great profusion of materials—many pieces of chert and flake tools, animal bones and deer antler, and marine shells. Shells lying on the hard floor, 60 cm. in depth as noted, were submitted for radiocarbon determination and yielded a C-14 determination of  $4070 \pm 80$  B.P. (UCLA-698). Based upon the presence of marine shells as well as the typology of the flake tools recovered, the cultural assemblage lying on the hard floor had been estimated in the field to be early post-Pleistocene, 4000 to 6000 B.C., after the sea had risen to more or less its present position and when shellfish would have been readily available for food. The sea level, as noted, reached its present level about 6000 years ago according to Fairbridge (1962), and the inhabitants of Duyong, cave, as shown by a C-14 date, were gathering shellfish about 7000 years ago (see below). Shellfish were not easily available before about 9000 years ago as also pointed out by their complete absence in Tabon Cave.

Although the C-14 date of approximately 4000 years ago for a relatively deep level in Guri Cave is seemingly recent, there is no *a priori* reason to believe that the inhabitants of Guri Cave would not continue to use flake and blade tools after the appearance of the small flake and blade tradition and Early Neolithic

tools. Anthropological studies clearly shown that local historical developments have not been by orderly stages; that new tools appeared and old tools persisted; that people at one time and in one area may live at dramatically different technological levels. And, there are new data from Palawan that flake industries survived until even the Metal Age.

*The Lithic Assemblages of Guri Cave.*—Although based upon only preliminary excavations, it is certain that the Tabonian flake tradition persisted in Guri Cave to well into the post-Pleistocene period. Again, although no detailed comparisons have been made between the flake tools of Tabon and Guri Cave, there is a suggestive increase in the number of flake tools from Guri Cave which have secondary retouching and there is a tendency for the flake implements from Guri Cave to be smaller in size. At least, there were no large flake tools recovered during the preliminary excavations in Guri Cave, large flake tools being common in Tabon Cave. There is no doubt in the writers mind that the flake assemblages of Tabon and Guri Cave belong to a single lithic tradition but the differences between the flake tools in the two caves which might reflect technological trends will not be known until further excavations and comparisons have been made.

Large blade tools also appear in Guri Cave for the first time, but only in the shallow levels as shown by study-profiles in which all of the blade and flake tools recovered were plotted. Further excavations, however, may show that blade tools are found at all levels. Blade tools, as discussed above, were not found in Tabon Cave, and the presence of blade tools in Guri Cave is of considerable importance to an understanding of lithic developments in Palawan and the Philippines. First, because the appearance of blade tools in Guri Cave requires a new flaking technique—*preparation of cores*. The Tabon inhabitants, as discussed at length above, did not prepare cores for flaking and consequently the primary and utilized flakes which are not retouched do not have recurring forms. Core preparation was practiced by the people who lived in Duyong Cave some 7000 years ago (see below) in knapping small blades, but this tool tradition is entirely distinct from the Tabonian flake industry. Following Mulvaney's (1966) analyses of Australian flake industries, the Tabonian tradition is a *nonhafted* technology; the Duyong small flake and blade assemblage, a *hafted* technology. Thus, the Tabonian flake tools were held in the hand, as were the core and pebble tools which have also been found in the Philippines (von Koenigswald 1958), but the small flake and blade tools of

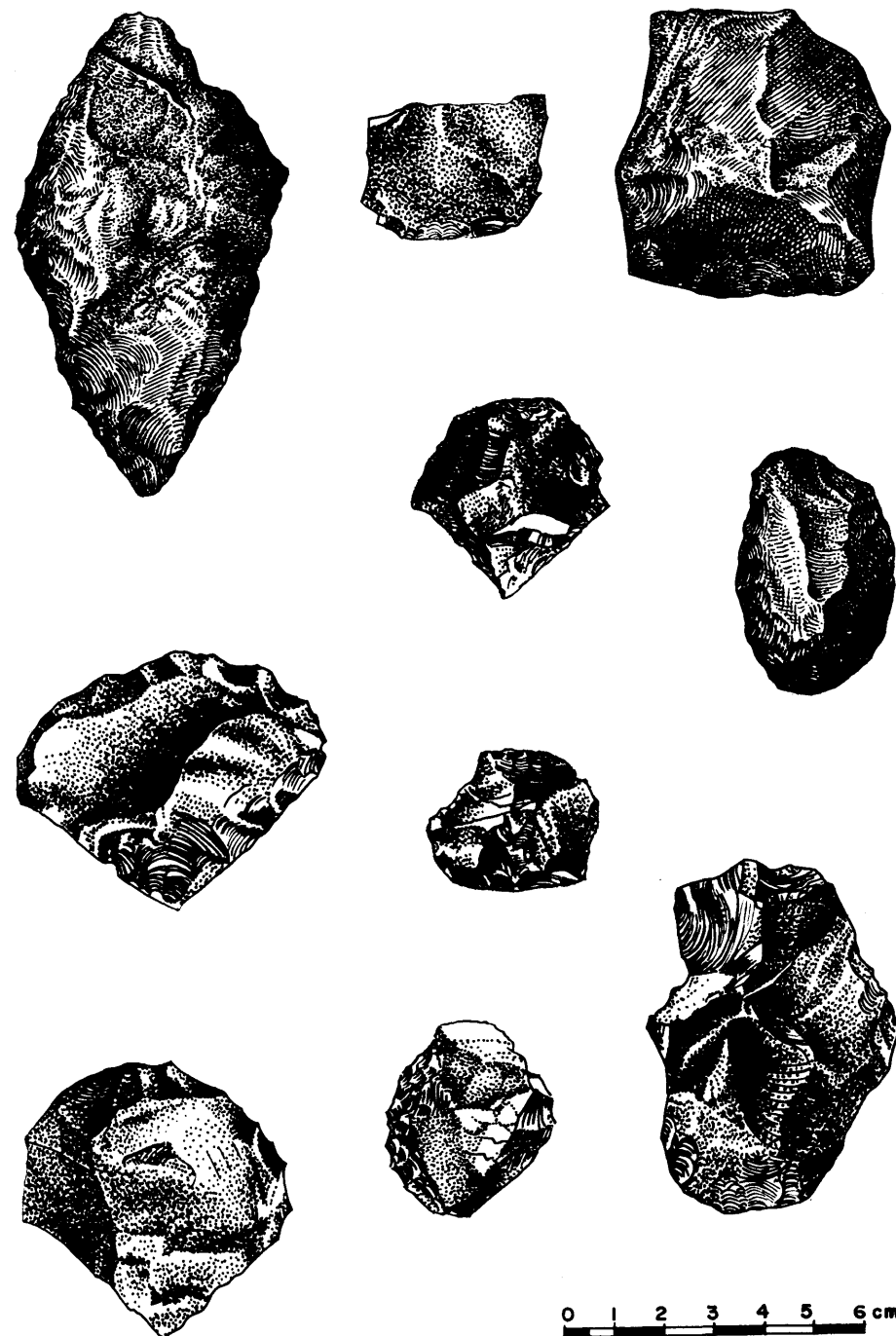


Fig. 14. Flake Tools from Guri Cave....

Duyong Cave were undoubtedly, as in Australia, "... set into a haft of bone or wood to form a composite tool" [Mulvaney (1966) 88].

Secondly, the writer and Mr. Alfredo Evangelista found a highly developed blade industry associated with the Late Neolithic of Sorsogon and Albay Provinces, Luzon (Fox and Evangelista: 1957a and 1957b). Dated by C-14 determinations of  $2050 \pm 200$  B.P. and  $1780 \pm 250$  B.P. [Crane and Griffin (1959) 196-197], this remarkably uniform Late Neolithic assemblage found in thirteen cave sites included: polished stone tools including stepped forms, shell and stone beads, shell spoons, primary (secondary?) burial jars, and parallel-sided chert blades which were struck from carefully prepared cores. The writer has seen similar blade tools from a number of areas of the Philippines but unfortunately these have no reliable data as to their cultural associations or age. Further systematic excavations in the Philippines, the writer believes, will reveal a widespread association of blade tools and flake tools with polished stone implements in both the Early and Late Neolithic. And, it is possible that the use of blade tools by Neolithic peoples developed as a result of the co-existence, as in Palawan, of early Neolithic traditions and the flake and blade industries of the Upper Palaeolithic and early Post-Pleistocene periods.

In addition to the presence of tens-of-thousands of marine shells in Guri Cave, the preliminary excavations yielded a greater number and variety of larger animal bones, when compared to the quantity of animal bones found with the flake assemblages of Tabon Cave. This strongly suggests the appearance (borrowing from the Early Neolithic peoples?) of more effective weapons for hunting as well as new trapping techniques. It cannot be attributed to differences in the number of the inhabitants of the two caves, for Guri Cave is much smaller in size than Tabon Cave and, it would appear, in the numbers of people living in the cave at any one time.

Caves have been discovered in the Sareg, Turmarbong, and Iwaig areas (Fig. 5) which also have surface associations of marine shells and flake tools. Some of these cave sites undoubtedly date from the same period as Guri Cave, and probably the richest rock shelter—Sa'gung in the Iwaig area—is now (February, 1969) being excavated by Mr. Jonathan Kress of Yale University. This excavation and the excavation of other cave sites with

flake tool and marine shell associations can provide with further excavations in Guri Cave the key to lithic development in Palawan beginning about 7000 years ago, as well as possible relationships between Upper Palaeolithic flake and blade technologies and the Early Neolithic.

*The Jar Burial Assemblage of Chamber B, Guri Cave.*—This shelf-like, rocky chamber was literally filled with jars, jar-covers, and smaller earthenware vessels which had collapsed in place. The contents of the collapsed jars were scattered on the surface and in the fissures between rocks. The assemblage included bronze fragments, jade beads and the distinctive jade ear-pendants (Fig. 37), as well as glass and gold beads (Color Plates I-B: b-c-d). Noteworthy, is one tubular red stone bead with white bands (Color Plate I-A: k), the bands being formed by etching with acid according to Dr. Alistair Lamb. Dr. Lamb pointed out, in conversations which the writer had with him in March, 1968, during the *Manila Trade Pottery Seminar*, that this type of bead has rarely been recovered in Island Southeast Asia. No iron fragments were found in Chamber B but one of the gold beads recovered also appear in Tadyaw Cave which yielded many iron tools. The jar burial assemblage of Chamber B is presently believed to be an early phase of the Early Metal Age, about 300 B.C. to 500 B.C. The pottery from this chamber is closely related to the Tabon Pottery Complex discussed at length below.

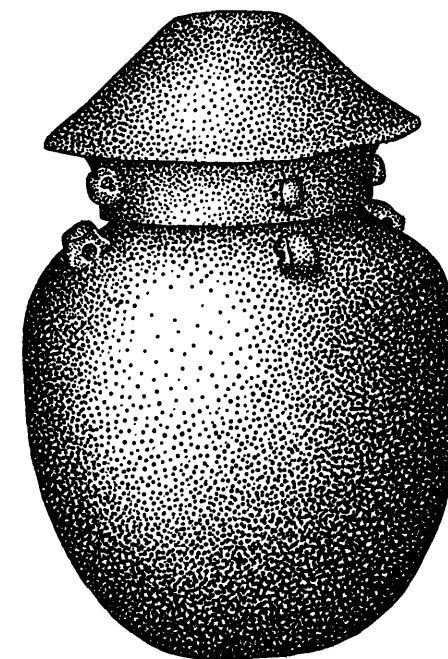


Fig. 15. Burial Jar with Cover Hidden on Shelf in Guri Cave (x1/4 natural size)

Pottery was found, as noted, in the other entrances and chambers of Guri Cave, but no excavations have been made in these areas. In a small, dark, interior grotto surrounded by limestone pillars—an incredibly beautiful setting for burial jars—one whole jar and fragments of another were found embedded in a

flow of limestone (Plt. IX); and sitting on a nearby ledge, a complete jar and cover (Fig. 15). In still another chamber, large fragments of jars and other vessels were recovered on a ledge behind a nest of rocks. Some of these materials undoubtedly date from a more recent usage of Guri Cave for jar burial. The excavation of Guri Cave remains a major task.

## CHAPTER IV

### DUYONG CAVE:

#### A Stratified Site with a Small Flake and Blade Industry and Neolithic Assemblages

*Description of Duyong Cave and Excavations.*—Duyong Cave is located along an isolated stretch of beach about 11 kilometers by water north of Lipuun Point (Fig. 3). Although not geographically one of the Tabon Caves, as noted, the cultural materials excavated in Duyong Cave are intimately linked with those of the Tabon Caves. The cave is thus discussed in detail in this report.

Duyong Cave is tucked into the land-face of a huge limestone boulder which stands on the sea shore, partly in the water and partly on land. The boulder is almost a cube in shape, approximately 30 meters in height and 75 meters in thickness. It is being continually undercut by wave action on the three exposed sides. The mouth of the cave is 4.5 meters above the present sea level. Another small cave, Bising, is found on the east side of the boulder and slightly higher in elevation than Duyong Cave. This cave also contained surface cultural materials but was not excavated.

Magmisi Mountain (Devil's Peak) rises in the background, being less than one-half hour's walk away from Duyong Cave. A number of excellent cave sites were discovered on this mountain (Fig. 3) but none have been excavated. A second peak to the rear, Nagkutun, contained one small and recent habitation site with Chinese trade pottery of the Ch'ing Dynasty and found in a place so inaccessible that it led local members of the exploration team to remark that the inhabitants must have been "Remontados," perhaps a family which had fled its community for social reasons.

All ill-defined though constantly used coastal trail passes directly below Duyong Cave. This trail connects the Tagbanwa and Pala'wan villages in the north with the Christian communities of Tabon and Alfonso XIII to the south. Despite its proximity to this trail, there was little evidence of Duyong Cave being disturbed by modern man. However, there are stories of Pala'wan mediums performing rituals in the caves of this area, breaking the ancient burial jars found in them during periods when the people were threatened by the deities of epidemic sickness.



The entire surface of Duyong Cave was covered by large sherds and other artifacts of a Metal Age jar burial assemblage (this assemblage will be discussed in detail below). Over 5,000 bones of the *Sirenia* or "sea cow" were also scattered on the surface and excavated in the sub-surface levels, suggesting the name of this cave—Duyong. The location of the bones of the sea cow in the cave shows that they had been *ritual offerings* made during the jar burial period. No other cave has been discovered in Palawan containing such a large quantity of sea cow remains, although a few bones of the *duyong* are invariably found in the jar burial cave sites.

A number of pieces of chert of a small flake and blade industry, as well as a unifice chopper and a very large core of chert, were also found on the surface of Duyong Cave. These had eroded from a deeper cultural level near the mouth of the cave (Figs. 16 and 17).

Duyong Cave is small; approximately 8 meters in length and 7 meters in width below the overhang. The front portion of the cave slopes towards the cliff, and a few surface artifacts had fallen to the beach below. A small shelf at the rear of the cave, some 115 cm. above the main floor, was literally packed with sherds, artifacts, and bones of the sea cow (Fig. 17). The entire cave was systematically excavated to bedrock and all of the soil screened.

*Time and Cultural Sequences of Duyong Cave.*—Four distinct cultural sequences were excavated in this cave of which three are of specific interest at this time:

- (1) Early Metal Age jar burial;
- (2-3) Neolithic burial with a C-14 determination of  $4630 \pm 250$  B.P. (2680 B.C.); and a Neolithic habitation level with a C-14 determination of  $5680 \pm 80$  B.P. (3730 B.C.) [UCLA-287 and UCLA-994 respectively]; and
- (4) A small flake-and-blade assemblage with a C-14 date of  $7000 \pm 250$  B.P. (5050 B.C.) [UCLA-288].

The single Neolithic burial is of considerable significance to Philippine prehistory. It is the first Early Neolithic burial, insofar as the writer knows, to be excavated in the Philippines and the first C-14 date for this period. Moreover, among the artifacts in the grave were adzes-axes made of *Tridacna*. These shell tools have highly suggestive relationships with the prehistory and peopling of the Pacific.

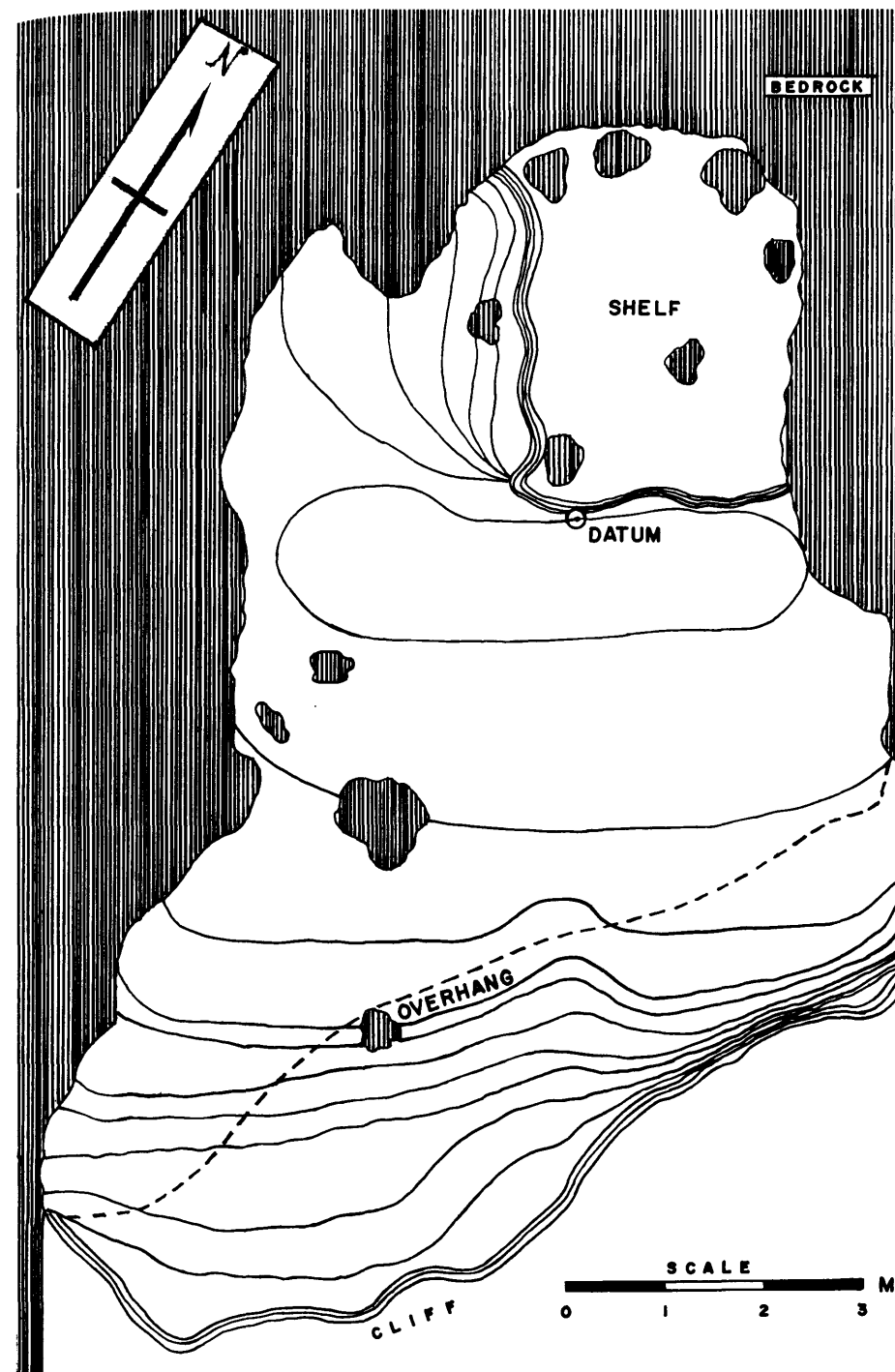


Fig. 16. Floor Plan of Duyong Cave; contour interval is 40 cm.



The small flake and blade tools, possibly related to the so-called "microliths" and "pseudo-microliths" of Luzon [Beyer (1948a) 14:16], also provide an initial date for this diagnostic and wide-spread tool tradition of the early post-Pleistocene period.

*The Small Flake and Blade Assemblage.*—The small flake tools and blade tools of this assemblage were excavated in a refuse layer composed of densely packed marine shells, and in a still lower level made up of a rubble of small limestone rocks in a compact dark brown soil. The shell midden varies in thickness from about 20 to 30 cm., and appears 30 to 40 cm. below the present surface. The rubble stratum appeared directly below the shell midden and continued to the bedrock of the cave, a depth varying from about 60 cm. to 130 cm. (Fig. 17). This midden was concentrated in the front central area of the cave, although a thinner habitation stratum with shells and chert was encountered elsewhere at the same level in the front part of the cave under the overhang.

The major source of protein for the people who used the small flake tools and blade tools were marine and brackish water shellfish. Land snails, *Helicostyla* spp., were also recovered. The same land snails still form a famine food today among the Tagbanwa and Pala'wan. A study of 2,543 shells from the principal midden area—the shells were identified by Mr. Fernando Dayrit, former conchologist of the National Museum—shows that they were all easily procured species; shallow water forms exposed in the sand or in muddy mangrove areas, or on reefs and rocky shores when the tide is low. Land snails are common in the forests during the rainy periods of the year. All of the shells found in the midden are eaten by the people today in Palawan. Table V provides a list of the more frequent species which were excavated in the midden in the order of their abundance.

Surprisingly few fragments of animal and bird bones and teeth were recovered in the midden. The animal bones have not been identified, but the bones of the wild pig and one large hawk were readily recognized. Pinchers of ten large shallow water crabs were also recovered in the midden as well as a barb from the tail of a sting ray. No deer bones were found.

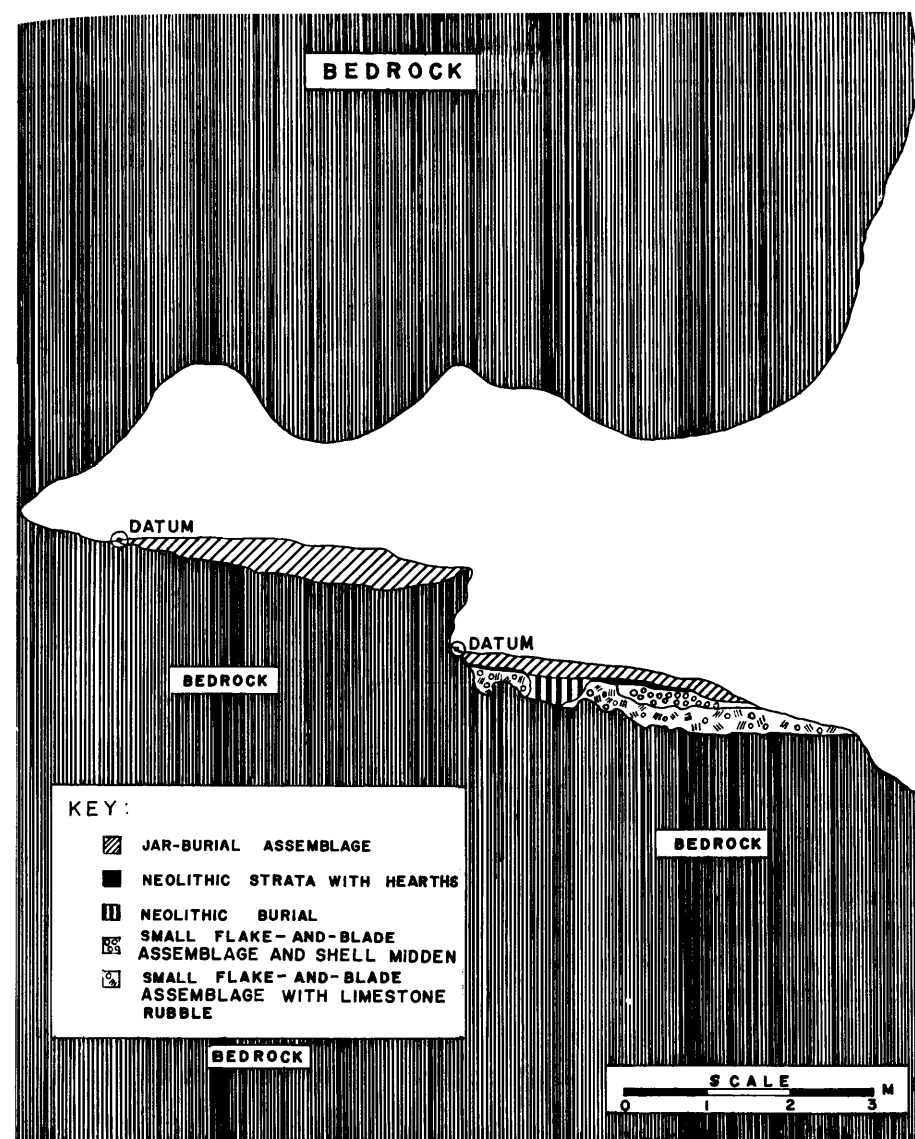


Fig. 17. Profile of Duyong Cave showing Stratigraphic Features.

Table V

SHELLS IN THE DUYONG MIDDEN ASSOCIATED WITH THE  
SMALL FLAKE AND BLADE ASSEMBLAGE

Species of Shells		
<i>Thiara</i> spp.	878	35
<i>Planaxis sulcatus</i>	143	11
and <i>Planaxis</i> spp.	146	
<i>Cerithium ornata</i>	226	11
and <i>Cerithium</i> spp.	56	
<i>Neritina gagates</i>	191	8
and <i>Neritina</i> spp.	13	
<i>Helicostyla</i> spp.		
(land snail)	181	7
<i>Meretrix lusoria</i>	158	6
<i>Nerita plicata</i>	92	
and <i>Nerita</i> spp.	26	5
<i>Natica</i> spp.		
<i>Acmaca sacharima</i>	42	
<i>Donax</i> spp.	39	
<i>Ostrea</i> spp.	36	
<i>Thiara</i> spp.	27	
<i>Trochus intercostalis</i>	20	
and <i>Trochus maculatus</i>	5	
<i>Nassarius</i> spp.	23	
<i>Cylotellina</i> spp.	15	
<i>Chione</i> spp.	14	
<i>Melanoides</i> spp.	13	
<i>Anadara nodifera</i>	10	
and <i>Anadara maculosa</i>	2	
<i>Littorinopsis</i> spp.	10	
Others (25 genera represented by less than 10 specimens each)	2,543	100%

(Less than 5 per cent)

The paucity of animal bones is striking. It is apparent that shellfish, as noted, were the major source of protein for these early post-Pleistocene food gatherers, probably attracting them to live on the coastal and near-coastal riverine areas of Palawan.

The small flake tools found in Duyong Cave show no evidence of retouching or secondary flaking; tools may be distinguished from the primary flakes by tiny flake scars along the working edges (see Fig. 18). However, small prepared cores from which the blades were struck were excavated. A few chopper tools made of chert (Fig. 18-C) were also encountered and one large basalt chopper.

*Comparative Data from the Philippines on Small Flake Tools.*—Small flake tools [and blade tools (?)]—Beyer's "semi-microliths," "pseudo-microliths," and "microliths"—were an early and widespread tool tradition in the Philippines. In Luzon, where Professor Beyer made extensive archaeological surveys, more than one-hundred collecting stations and sites were found which contained "...mostly microlithic obsidian and flint implements... in stratified deposits [geological or cultural (?)] of probably very Late-Pleistocene or early post-Pleistocene geologic age" [Beyer (1948a) 16]. Elsewhere, Beyer (1948a: 14) dates the "Mesolithic microliths" from Rizal and Bulacan Provinces as "...from ten to fifteen (or a maximum of twenty) thousand years ago..." and he notes that the "...people seem to have lived chiefly by hunting, and no signs of any sort of agricultural activities have been found."

The C-14 date of the small flake and blade industry of Duyong Cave, 7000±250 B.P. (UCLA-288), is much later than Beyer's estimate. But then Beyer places the Pleistocene-Holocene boundary at a much earlier date, "20,000 to 15,000 years ago" [Beyer (1948a) 80]. Both data agree that the small flake tools—the so-called "microliths"—are characteristically post-Pleistocene, although the writer believes that this tradition first appeared during the Late Pleistocene. In Palawan, moreover, the Tabonian flake tradition and the small flake and blade industry co-existed and the basic difference in their method of manufacture and use would suggest that two distinct peoples and cultures were represented.

The small flakes of obsidian, flint, tektite glass, and so forth which Beyer describes generally as "microliths" and "mesoliths", as well as the many small obsidian flake tools which the writer has collected from the surface of sites in Rizal, Laguna, and Cavite Provinces are technologically similar to the flakes of Duyong Cave. None of these small flake assemblages show evidence of core preparation and little secondary retouching; however, the small blade tools of Duyong Cave were struck from carefully prepared cores which are represented, as noted, in the materials excavated.

The writer knows of no site in the Philippines which has yielded "geometric microliths" such as are found in India or flake assemblages in which secondary retouching was extensively used as have been recovered in Java [see von Heine-Celdern (1945) 134 and Fig. 35]. Future excavations in the Philippines may reveal, however, these more sophisticated types of "microliths." The writer, as discussed elsewhere (Fox 1967), has not used the term "microlith" to describe the small flake and blade tools from Duyong Cave. Terms such as "microlithic," particularly when used in pioneer areas of research, imply past cultural relationships which may not be justified on the basis of the available archaeological record. The use of the term "mesolith" is also highly tenuous [Fox (1967) 107]. The excavations in Palawan, as discussed, have still not revealed distinctive tools or cultural patterns which would justify employing the term "Mesolithic" for a distinct period of the prehistory of Palawan. Despite Beyer's views (1948a), there are also no evidences from systematic excavations or stratified sites in the Philippines for distinguishing a "Mesolithic" period for the Philippines in general.

*The Neolithic Burial.*—The excavations in Duyong Cave revealed a single Neolithic burial (Plt. VIII and Fig. 17) that had been dug into the deeper stratum of rubble and compact dark brown soil in which the small flake tools and blades were found. The top of the skull was 40 cm. below the surface and charcoal found in the grave fill yielded a C-14 determination of  $4,630 \pm 250$  B.P. or 2680 B.C. (UCLA-287).

The skeletal remains were those of a muscular male adult, 20 to 30 years of age, and 179 cm. in height as reconstructed

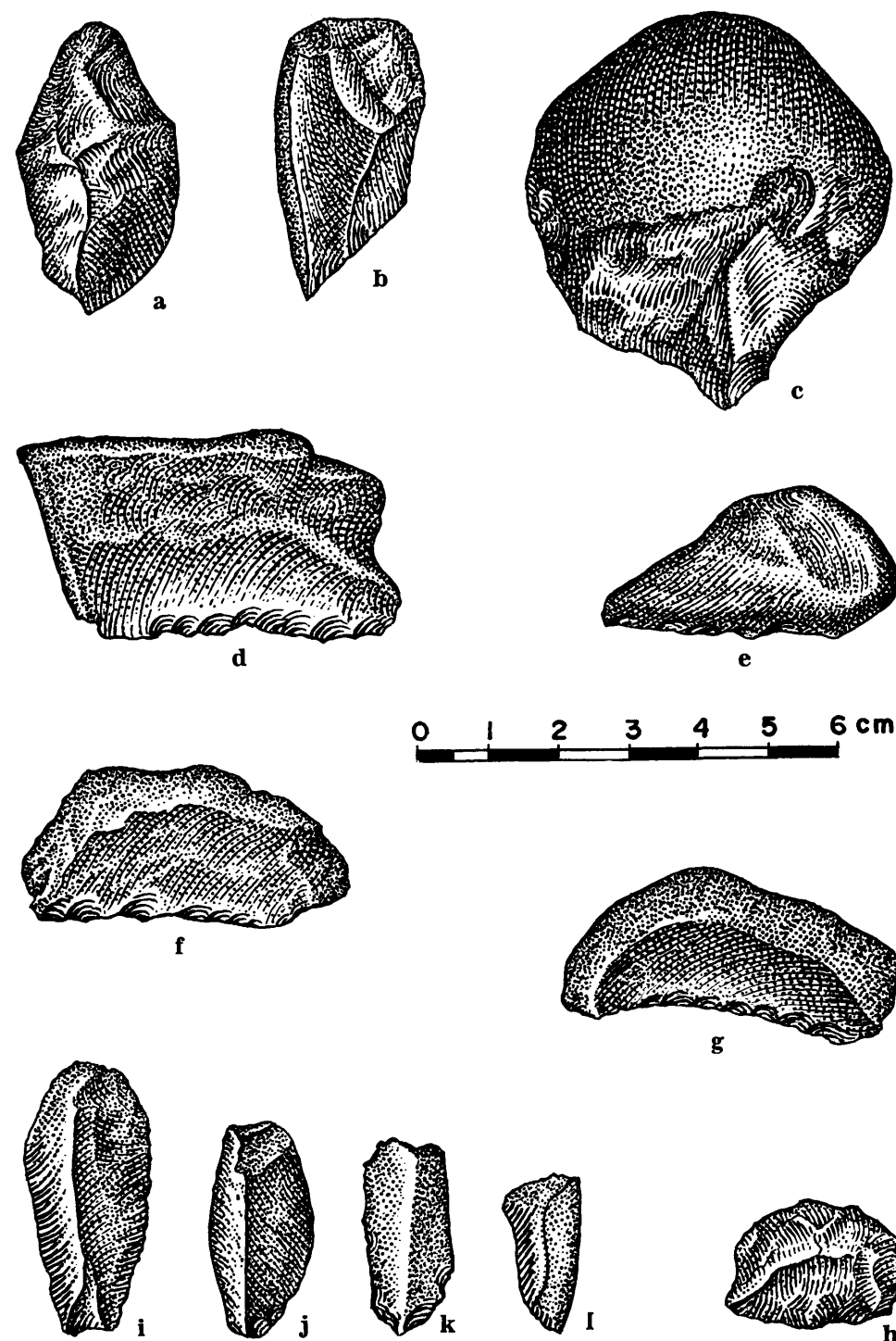


Fig. 18. Small Flake-and-Blade Assemblage from Duyong Cave.

from the length of two long bones [Cornwall (1956) 236]. The skull was badly crushed and no measurements or descriptions were possible. The body was buried in a flexed position, face down, with arms and legs doubled beneath the body. Neatly arranged along both sides of the body was one large polished stone adze-axe and four adzes-axes made from the Giant Clam (*Tridacna gigas*). Two shell disks perforated in the center were recovered—one next to the right ear—and these are believed to be ear ornaments (Fig. 19-d). Similar disk-like ear pendants are found today among pagan peoples in the Philippines, such as the Agta and Ilongot of Northeastern Luzon. A similar round and flat shell disk but perforated on the edge was found at the chest; it is presumed to be a pendant (Fig. 19-c). These shell disks were all made from the tops of *Conus litteratus*.

Near the feet were six whole *Arca* shells. One of these had a round hole on one side and the shell was filled with lime (Fig. 19-f). An identical *Arca* bivalve with a hole was found in Batu Puti Cave which also yielded a badly disturbed assemblage of Neolithic stone and *Tridacna* adzes-axes. The lime in the Batu Puti specimen was partly gouged out beneath the hole in the shell. These are believed to be lime containers and probably associated with betel nut chewing (see below).

Lying between the surface and sub-surface levels which contained the jar burial assemblage and the deeper midden of the small flake and blade assemblage was a thin stratum which yielded one implement made from a *Tridacna* shell (Fig. 43-e), a portion of a large *Tridacna* gouge, a number of shell disks believed to be ear pendants identical to those found in the Neolithic grave, and hearth-like areas of dense charcoal. While excavating Duyong Cave, we were confused as to the association of these "hearths," whether or not they were contemporaneous with the jar burial assemblage or the thin and scattered Neolithic level. A charcoal sample from one of the "hearths," however, provided a C-14 date of 5,680±80 B.P. or 3730 B.C. (UCLA-994). It is now apparent that these "hearths" were formed during the Early Neolithic.

Duyong Cave would have been an excellent shelter for hunting, fishing, and food gathering activities, but would hardly have been

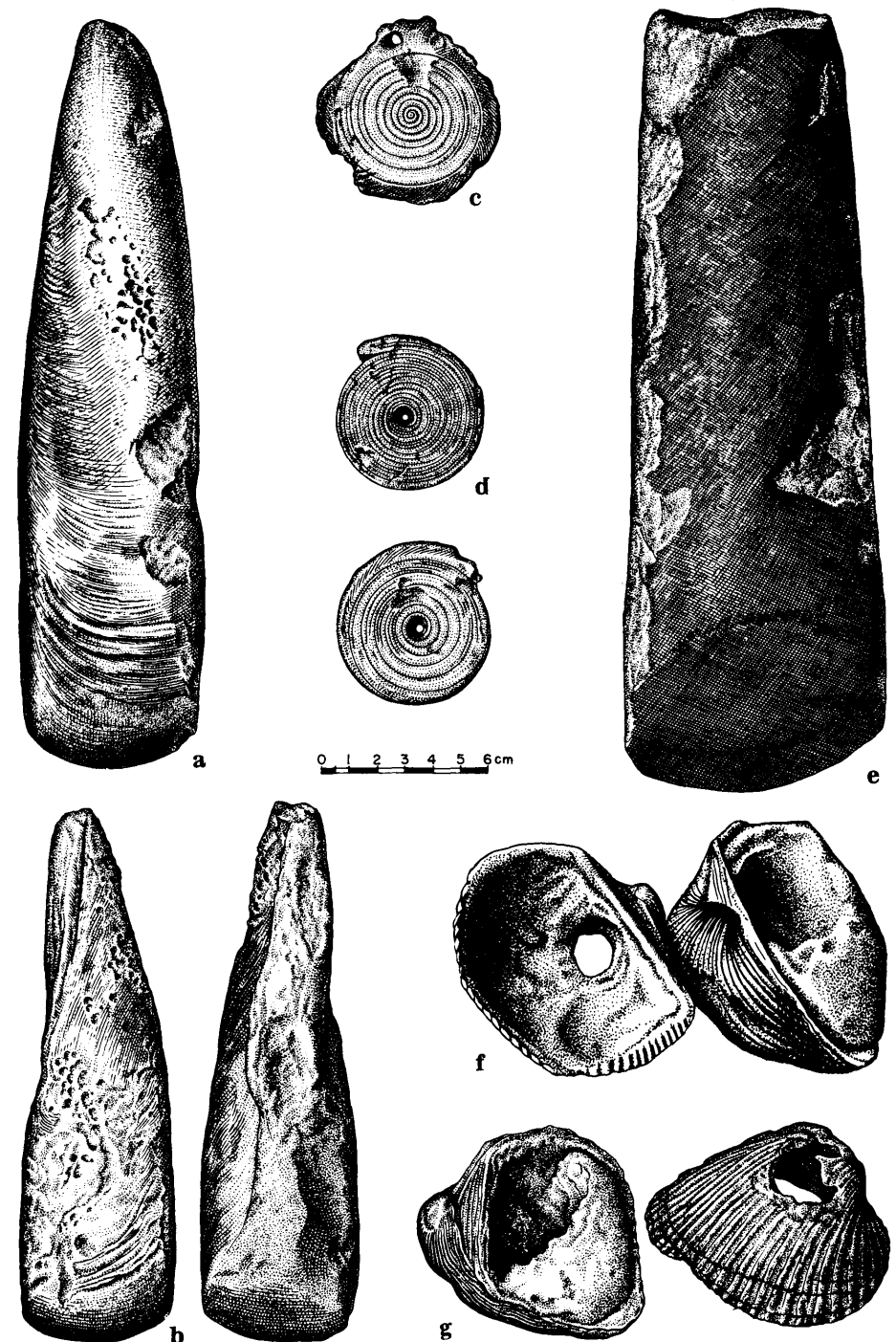


Fig. 19. Artifacts associated with Neolithic Burial found in Duyong Cave: (a) large *Tridacna* shell adze; (b) front and back view of smaller *Tridacna* adze-axe; (c) shell pendant; (d) front and back view of Cone shell ear ornament; (e) large polished stone adze; (f) lime container with Duyong Neolithic burial; and (g) similar *Arca* shell lime container from Bato Puti Cave, Lipuun Point.

by Beyer (1947: Plt. 5) as "protoneoliths," and may well be representative of an Early Neolithic type. Beyer (1948a: 81) dates the "protoneoliths" as appearing "...about 6000 to 4000 B.C. or later." Harrisson (1959: 1) has recovered edge-ground tools at Niah, Borneo, in a stratigraphic context and dates them as first appearing about 7000 B.C.

Pilanduk Cave is relatively large and in elevation well above disturbance by past eustatic changes. An excellent habitation site and apparently rich in cultural sequences, this cave will be excavated by Mr. Jonathan Kress in 1969-70, and it is hoped that definite data as to the dating and cultural associations of the edge-ground tools will be obtained.

In the Kalatagbak area (Fig. 5) on the surface of a cave called Mara'may by the local Pala'wan, Mr. Angel Espeleta working with the National Museum Field Team recovered a second edge-ground implement (Fig. 20) made from a pebble. No excavations have been made in this cave.

Stone adzes, locally called "thunder teeth" and used as charms, have been obtained from the Pala'wan inhabitants of villages just north of Pilanduk Cave and in the Iwaig-Isugud area. This entire region has numerous limestone outcroppings, not yet explored, and almost certainly has Neolithic cave or open sites, particularly in view of the possession of polished stone artifacts by the local Pala'wan inhabitants.

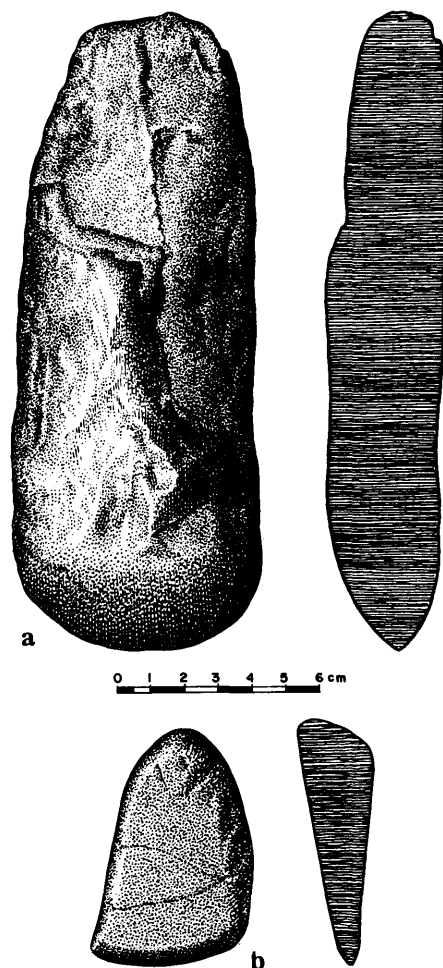


Fig. 20. Edge-ground tools:  
(a) from Pilanduk cave;  
(b) from Mara'may cave.

## CHAPTER V

### THE JAR BURIAL COMPLEX OF THE TABON CAVES

The caves on Lipuun Point for which definitive data from excavations are available, twelve in all, as well as Duyong Cave in the Iwaig area, have clearly revealed one historically related jar burial tradition and pottery complex; and surface collections from many other caves within the Quezon area show a collateral tradition. This jar burial and pottery complex first appeared in the Tabon Caves during the Late Neolithic and persisted, as probably the major type of burial in this area, until the Developed Metal Age; a time span from about 1500 B.C. to 500 A.D., and possibly later.

The tradition of burying bones in jars and hiding the jars in caves continued in western Palawan until well after the beginning of Chinese trade. Burial jars have been found in caves in association with Chinese trade pottery of the Sung Dynasty (960 to 1279 A.D.) and the Yüan Dynasty (1280 to 1368 A.D.). But new types of earthenware potteries are associated with the later burials in stoneware jars of Chinese origin. Jar burials in caves during the proto-historic period are rare, however, and accidental finds and surveys on the east coast of Palawan show that the people at this time were burying their dead in open sites rather than placing them in caves. Secondary burial in Chinese stoneware jars, though not usual, was reported [Fox (1954) 57] among the neighboring Tagbanwa of Central Palawan as late as the early twentieth century. The jars with human bones were also interred by the Tagbanwa. Elsewhere in the Philippines (see Appendix I) jar burial is still practiced.

Burial in jars may be either *primary*, the entire body being placed in a jar; or *secondary*, only bones being placed in the jar. Multiple burials of more than one body or the bones of a number of individuals are also encountered, as well as the combination of a primary and secondary burial. Thus, at Calatagan, Batangas, an infant had been placed in a stoneware jar with seven skulls. Burial in jars was a common practice throughout the Philippines during the late prehistoric and proto-historic periods; and, as will be discussed at length below, the idea of jar burial and its varied practice in the Philippines can not now be attributed to the single migration of a "Jar Burial People" from the north during the "Iron Age" (Beyer 1948b).

*The Chronology of the Jar Burial Cave Sites.*—Six burial caves—Ngipe't Duldug, Manunggul, Uyaw, Duyong, Pagayona, and Tadyaw—will be discussed in detail below to illustrate the historical development and the varying cultural patterns associated with jar burial in Palawan. Pertinent data from seven other caves or chambers of these caves which have been completely or partly excavated—Tabon, Uyaw, Guri (Chamber B), Pawikan Ledge, Diwata, Rito-Fabian, and Batu Puti—will also be considered.

Three C-14 determinations from two chambers of Manunggul Cave have provided absolute dates for the Late Neolithic and Developed Metal Age phases of the Tabon jar burial tradition:

- (1) Manunggul Cave (Chamber A), a Late Neolithic assemblage dating from 890 B.C. (UCLA-992A) to 710 B.C. (UCLA-992B); and
- (2) Manunggul Cave (Chamber B), a Developed Metal Age assemblage dating 190 B.C. (UCLA-992C).

The relative chronological positions of the other jar burial assemblages of the above mentioned Tabon Caves have been established on the basis of a comparison of the key types of artifacts (see Table IV), such as the presence, absence, or association of stone tools with bronze objects and/or iron implements, and their relative quantities. Specific attention has been paid to the presence or absence of jade ornaments and diagnostic types of stone and glass beads. A comparative study of key pottery attributes, such as the presence or absence (and quantity) of bound or carved paddle decoration, was also utilized in the evaluation of the relative time sequence of the jar burial caves. Historical changes in the principal pottery types will be discussed in detail below.

In general, the deposits encountered in the jar burial caves were very shallow, usually 10 to 20 cm., and unfortunately no stratified sequences of jar burial assemblages were encountered and/or identified. Nevertheless, the caves or chambers of caves included in Table VI have diagnostic and remarkably consistent assemblages of artifacts, as noted, and these cave sites were utilized for burial for only a relatively short period (except Tadyaw). In addition, comparative studies of the total corpus of artifacts from these key jar burial caves, as will become apparent below, show very distinct assemblages of artifacts. Other caves, on the contrary, were obviously used over and over again for jar burial

Table VI

COMPARISONS OF THE STONE, METAL, AND GLASS  
ARTIFACTS FROM NINE JAR BURIAL CAVES

Cave and the Cultural Sequences	Stone Adzes	Bronze Fragments	Iron Fragments	Glass Beads and Other Ornaments
<i>Late Neolithic</i>				
Ngipe't Duldug	1	0	0	0
Manunggul (Chamber A)	0	0	0	0
<i>Early Metal Age</i>				
Duyong	3	27	1 (?)	0
Uyaw	1	36	1 (?)	8 beads 1 bracelet
Tabon <sup>a</sup>	0	1	0	3 beads 1 bracelet 1 ornament (?)
Guri	0	2	0	3 beads
<i>Developed Metal Age</i>				
Rito-Fabian	0	1	1	13 beads 1 bracelet 1 ear-pendant
Pagayona	0	5	1	5 beads
Manunggul (Chamber B)	0	0	30	58 beads 1 bracelet
Tadyaw <sup>a</sup>	0	6	20	200 beads 2 bracelets

<sup>a</sup>Excavation of this cave is not yet completed but it is not believed that further excavations will change its temporal position.

and artifacts from the Neolithic to the Metal Age are mixed.<sup>4</sup> No attempt was made to arrange the cultural materials from these latter caves in chronological sequence or to include them in the descriptive tables, such as Table VI, X, and XIII.

*General Cultural Patterns of the Tabon Jar Burial Complex.*—A number of persisting cultural patterns may be seen from a comparative study of the jar burial practices in the Tabon Caves which points to a historically related complex. All adult burials were *secondary*; not a single jar has been found of a size which would have allowed for the primary burial of an adult [see Fox (1959a; Plt. 4) for an illustration of a primary burial jar from the Bato Caves]. Insofar as it was possible to tell, however, one jar in Tabon Cave was used for the primary burial of an infant. To date, no absolutely undisturbed jar burial has been found, and it is not known whether or not multiple secondary burial was practiced, although it is suspected. Comparisons of the vessel count of jars in each cave with the number of individual human remains found in each cave would indicate, nevertheless, that it was the general practice to place the bones of only one person in one jar.

The data also suggest that only skulls were sometimes placed in smaller vessels, skull burial being a widespread practice in the Philippines during late prehistoric times. A small pottery box with cover (Fig. 27-f) was excavated in Bato Puti Cave which contained only the teeth of more than one individual.

The bones of children, juveniles, and adults of both sexes were placed in jars; rarely infants. The paucity of infant bones may reflect a past cultural pattern. Today, many indigenous Filipino groups do not ascribe socio-religious status to newly born infants. It could also be due to a more rapid disintegration of infant bones.

Physically, the people who buried their dead in the Tabon Caves were the variable "Southern Mongoloid"—skulls have broad

<sup>4</sup>It is not unusual to find caves, for example, which have 14th, 15th, and 16th century trade pottery from China, Thailand, and Annam mixed up with 19th and early 20th century Chinese pottery. Mr. Avelino Legaspi of the National Museum with Mr. Jesus Cabarrus, Jr., and Mr. Jerry Lobregat excavated such a cave in Samar, and point out that the modern people still make ritual offerings for spirits in the cave using recent porcelains, probably in part stimulated by the presence of the prehistoric materials including human bones.

and prominent malar bones, deep nasion, guttered lower nasal apertures, shovel-shaped incisors, and so forth—showing relationships generally to the physical types of indigenous peoples who live in Palawan today and elsewhere in the Philippines.

Phalanges of the hand and foot were frequently recovered in screening the deposits around the collapsed jars. The excavation of these many small bones would indicate a type of maceration which would allow for the recovery of complete skeletons for subsequent burial in jars. A single reference in a Tagbanwa myth to the exposure on platforms of human remains [Fox (1954) 219-220] provides one local ethnographic clue to past practices in Palawan (see Appendix I).

In one of the smallest caves, Ukir Ukir, on Lipuun Point, which is composed of a single small chamber reached by squeezing through a tunnel-like opening, the remains of at least two individuals were found scattered on the surface (this cave has not been completely excavated). One plain earthenware vessel was found with the remains, and in front of the mouth of the cave there was a second vessel with incised designs characteristic of the Tabon Pottery Complex. It is possible that this small cave was used as a crypt to allow for maceration, as practiced by the Ifugao of northern Luzon today. However, this was the only cave on Lipuun Point yielding this burial pattern. If small grottos and caves were being used for the maceration of bodies, than more than one grotto for this purpose would have been discovered in view of the hundreds of burials in the Tabon Caves. It is presently believed that Ukir Ukir Cave provides an example of another type of burial practice contemporaneous with jar burial; bodies merely being wrapped in mats and placed on the surface of small coffin-like caves.

During the Neolithic and early Metal Age, the bones were painted with a red hematite before being placed in the jars (the ethnographic data from Southeast Asia would suggest that the painting was done after ritual bone washing). Whether or not this was always the practice is not certain, for unpainted bones are also found with painted bones in the caves. However, hematite painting fades quickly, particularly when bones are exposed on the surface of caves which are bathed constantly with sunlight. The data from the Tabon Caves would indicate that the custom of bone painting was gradually abandoned during the late phase of the Metal Age and had disappeared entirely in Palawan by Chinese contact, about the 11th or 12th century A.D.



A study of the interior of many skulls shows that the bones were not only "painted" in the conventional usage of this term, but either "dipped" into a solution of hematite, the painting flowing into depressions as in the interior of the cranium which could not possibly have been reached by a brush, or a solution poured over the bones. Numerous fragments of hematite have been found in the burial caves, and a paint pot made from the half of a small *Tridacna* was excavated in Bato Puti Cave. The evidences would suggest too that the bones were sometimes painted in the burial cave or that the painting was renewed there.

In Leta Leta Cave at El Nido, a scoop made from the "Baler Shell" (*Melo diadema*) and filled with pounded hematite was recovered. Secondary burials of painted bones probably bundled and placed on small shelves in this cave (or interred) were also excavated. These are dated from the Late Neolithic. One *primary* flexed burial was excavated in this cave in which all of the bones and ornaments were deeply stained with hematite. These remains had been buried in literally a mound of hematite; and the bones, after natural maceration, had become stained by the surrounding hematite. This latter burial probably dates from a late phase of the Early Neolithic.

In the Tabon Caves, bones of the sea cow, shell beads, and shellfish placed in the caves as food offerings, and even jars and jar covers were painted with hematite. It is evident that painting with hematite had a deep ritual meaning closely associated with death and funerary practices. Red is still an important ritual color among many minority peoples in the Philippines. A red color may also be obtained from local plants, such as from the 'sappanwood' (*Caesalpinia sappan*), but hematite was undoubtedly the primary material used in bone painting.

The cultural materials which have survived with the burial jars, other than beads, are surprisingly scarce, a condition which may be due to grave robbing. Many perfect jars have been found with covers removed (in some instances the covers had been sealed to the jars with lime) and with no artifacts in the jars. There is no evidences of disturbance of the caves in modern times. The locations of almost all of the caves were not even known to the present residents of Quezon. When the Museum team arrived, the local people were generally afraid of the caves believing them to be inhabited by potentially malign spirits and many folk tales about the caves were heard (Casiño 1965). The grave robbing appears to have taken place during ancient times.

The "grave furniture" was composed largely of personal ornaments—beads, earrings and ear-pendants, and bracelets. Tools and weapons, as well as household utensils such as spoons and scoops made of shell, were relatively infrequent. Ethnographic data would suggest that many ornaments and other items were made of wood and plant fibers which have disintegrated.

The burial jars were usually, possibly always, provided with covers. These ranged from simple, inverted, bowl-like lids; the diagnostic trunconical covers of many shapes, and beautiful figurine covers (Color Frontispiece and Fig. 49). A round wooden object believed to be a cover was excavated in an extremely dry area of Tabon Cave, and it is likely that wooden covers were used. The pottery covers, as noted, were frequently sealed to the jars with lime or a compound of lime and resin (Fig. 40-g). The lime used to seal the covers to the jars was sometimes continued as a heavy applique forming vertical lines of decoration on the covers. A few covers had small "windows" which would have allowed for placing ritual offerings in the jars after the jars and covers had been sealed together.

Selection of the caves and chambers of the caves for placing the burial jars followed specific patterns. With the exception of Tadyaw Cave, the mouths of all of the burial caves discovered to date on Lipuun Point faced the sea. The choice of the burial cave, by any standard, provided an attractive resting place for the dead. The dozens of caves found in the cliffs within the dark interior valleys of Lipuun Point were not used for burial. A similar pattern was encountered in the Albay Gulf area of southern Luzon where the Late Neolithic jar burials were all found in caves facing the sea [Fox and Evangelista (1957b) 58-59]. And, at El Nido in northern Palawan the burial caves also overlooked the sea.

The jars were invariably placed in the entrance chambers of the caves; dry areas which were reached or flooded by sunlight. This was the usual practice and in only a few cases were the jars hidden in dark interior grottos or chambers, as in Guri Cave and Tadyaw Cave. A number of caves were found on the sheer face of the towering limestone cliff on the northwestern side of Lipuun Point; settings, as noted, which were unquestionably consciously chosen for their beauty. A few of the caves could only have been reached with ladders and placing the jars in these caves would have been an extremely difficult task, as their removal from the caves by the Field Team demonstrated.



The jars were merely placed on the surface of the cave, and most frequently near and along the walls of the cave. They were sometimes enclosed within a nest of rock, possibly to protect them from disturbance by wild pigs, porcupines, and other animals which often nest in the caves. Rocks were also used to support the jars which had round bottoms. Smaller vessels were simply scattered around the jars, reconstruction of their original positions in the burial caves showing no pattern. No architectural structures have been found in the caves.

The discovery of a burial cave on Lipuun Point was always a dramatic sight; the many jars and other vessels, sometimes whole but usually collapsed in place, resting on the floor of the cave where they had been placed hundreds of years ago. It was only the inaccessibility of the caves, the isolation of the Quezon area generally, and the fear which the modern people had of the caves that protected the jars from destruction.

The excavations indicate that the burial caves were revisited and re-used many times after the jars had originally been placed in the caves. Numerous fragments of charcoal and "hearths" which provided C-14 samples were found in the burial caves near the jars. Small earthenware vessels also show evidence of use, i.e., soot on the outer surfaces. The presence of the "hearths" and used vessels is interpreted as resulting from food preparation during rituals or simply visits to the caves. In some caves, broken jars had been placed on ledges or along the side of the cave to provide more space, it would appear, for new jars and ritual activities.

A highly developed cult-of-the-dead has been a principal feature of the indigenous religions in the Philippines and Palawan, the living maintaining intimate ties with their soul-relatives which involved frequent visits for divination purposes to burial places (Fox: 1954 and 1965a). The jar burial assemblage, as described herein, is in fact only a part of an ancient cult-of-the-dead encountered throughout the Philippines and Southeast Asia.

*Other Types of Burial.*—A number of other types of burial were found in association with the jar burial assemblage, including simple interment in a supine position, "bundle" burials, remains placed on the surface of a small cave and probably wrapped in a mat, and "skull burial." In contrast to the data from nearby Borneo [Harrisson (1962) 7-9], however, the range of the types of burials in the Tabon Caves is not great; rather strikingly uniform.

In a small grotto in Batu Puti, the remains of seven individuals (5 adults, 1 juvenile, and 1 child) were found in an orderly pile where they had been bundled together. The number of individuals was determined by a study of the long bones, for fragments of only one skull and three mandibles were present. Two whole pottery vessels, shell and jade bracelets, a scoop made of *Melo diadema*, and fragments of bronze were recovered with the bones.

Three primary burials, the skeletons in an extended and supine position, were excavated in the entrance chamber of Batu Puti Cave. These skeletons were associated with sherds of the Tabon Pottery Complex, shell spoons made of the Chambered Nautilus, and beads made of shell and teeth.

A single human skull was found hidden in a small grotto near Batu Puti Cave, and nearby the complete skull and mandible (no postcranial remains) of a monkey. As there were no associated cultural materials which could provide a relative date for the skull, its association is not certain. But there is no reason to assume that this human skull does not fall within the time and cultural sequences of the jar burial assemblage found in the Tabon Caves. Further excavations may reveal other types of burial but the pattern—secondary burial of human bones painted with hematite and placed in jars which had covers—is remarkably uniform.

*The Tabon Pottery Complex.* — The excavations in the Tabon Caves and Duyong Cave have yielded at least 1500 whole or reconstructable earthenware vessels and tens-of-thousands of sherds which show a wide but related range of forms and decoration. A thorough study of this pottery would be a major project in itself, worthy of the attention of one or more ceramic specialist. At this time, the writer will attempt only a preliminary description of the general features of this pottery and its possible historical relationships with pottery complexes found elsewhere in the Philippines and Southeast Asia.

The brief comparative study of this pottery indicates that it forms a single probably homogenetic complex, and is described herein as the *Tabon Pottery Complex*. Examples of unique, intrusive wares occur, and there are evidences of recurring external influences as well as local ceramic developments. New forms and designs appear; others disappear or lose favor. Nevertheless, the pottery has distinct and unique features which persist from one time

period to another and justify its description at this time as a separate pottery complex. The Tabon pottery does show similarities with the potteries which have been described by Solheim (1959b and 1959c; 1964b) as Kalanay and Sa-huynh, as well as with the Niah pottery [Solheim (1959c) 167-176]. But, until more detailed data are available from the Philippines and elsewhere based upon systematic excavations that will allow for an "historical typology," tracing cultural and pottery developments through the time as well as space [Suggs (1961 18], the distinction of the Tabon Pottery Complex will be useful.

*Method of Study.*—In this preliminary analysis, the pottery types have been tentatively established for descriptive purposes on the basis of (a) *surface treatment*, including decoration, and (b) *form*. The approach follows closely the extensive and relevant researches of Wilhelm G. Solheim II on Philippine and Southeast Asian potteries (see Bibliography), and the technical study of Anna O. Shepard (1957). Brief remarks are also included concerning the method-of-manufacture of the Tabon pottery.

The percentage of each pottery type by cave or by the chamber of a cave was based, in most instances, upon exact vessel count; in other instances, upon only an enumeration of rim sherds. Not only was an exact vessel count easily obtained in small caves, such as Pagayona, but the original position of the vessels in the caves could be mapped (Fig. 44). Vessels from these relatively undisturbed caves which were either whole or had merely collapsed in place have been restored and are being returned to their original settings in the caves (it is planned to establish the Tabon Caves as a National Park). The quantitative data for other caves where the vessels were badly broken and scattered are less exact. Excavations in the large caves which contain hundreds of vessels have not been completed, including Tadyaw which is discussed below, and no statistics are available.

Analytical problems were also encountered in this preliminary field analysis which influenced the quantification of the pottery types. Thus, without the availability of microscopic examination, it was difficult to distinguish with certainty the use of slips, except when marked contrast existed between the color of the slip and the paste as in the case of red slipped wares. Carefully smoothed and unslipped plain wares are not easily distinguished from lightly polished unslipped pieces which have a matte finish. Paddle impressions were often smoothed over after the

impression had been made in the plastic clay and distinction between cord marking with a bound paddle and grooving with a carved paddle were obliterated and thus difficult to detect. A red paint, probably hematite mixed with an organic medium, was applied after firing or re-fired at a low temperature. These unfired paints fade and decay on exposed sherds, and sherds which may have been incised and then painted would appear in the analysis only as incised.

Despite problems such as these which were encountered in the brief field analysis, the pottery of the Tabon Caves may be grouped for a preliminary description into nine provisional types. These are: (1) *Tabon Plain*; (2) *Tabon Polished*; (3) *Tabon Impressed*; (4) *Tabon Incised*; (5) *Tabon Painted*; (6) *Tabon Organic Glazed*; and combinations of these (7) *Tabon Incised and Impressed*; (8) *Tabon Incised and Impressed: Painted*; and (9) *Tabon Incised and Painted*. By using these nine tentative pottery types, it is possible to provide an overall description of the basic characteristics of the Tabon Pottery Complex, although in the final analysis it may be necessary to modify these preliminary types.

*Brief Notes on the Method-of-Manufacture.*—The pottery was formed by freehand modeling being worked initially by hand and then with a paddle-and-anvil. There is no clear evidence of the use of a slow wheel or tournette despite the fact that many vessels are almost perfectly symmetrical. The interior of vessels frequently show the impression of an anvil, as well as marks made by the knuckles and the palm of the hand (Bernardo and Viola 1965). Paddle marks may also be seen on the exterior surfaces of larger vessels, such as jars. As the impressions found in the interior of vessels are commonly round, it is likely that the large opercula of the "Green Snail," *Turbo marmoratus*, were used as anvil as well as for polishing. These opercula were frequently excavated in the caves. Polishing tools were also made of round, water smoothed stones. Some very small pots were formed only with the fingers. Rims and foot-rims ("ring feet") were characteristically shaped separately during the process of manufacture and then welded to the body of the vessel, as were appendages such as handles, lugs, spouts, and decorated fillet. Vessels were scraped and smoothed after shaping.

The basic tempering material was sand. The sand temper of smaller and thinner walled vessels is fine, suggesting that the sand was pounded and winnowed before being mixed with the clay.

A similar practice is followed today by the Tagbanwa and Palawan. In larger vessels, the sand and other non-plastics tend to be coarse.

Despite the estimable quality of the finished products, it is apparent that the pottery was fired at a low temperature—hence an “earthenware”—with little control over the firing atmosphere. The ethnographic record from Palawan and from elsewhere in the Philippines again suggests that the pottery, after drying, was merely fired on top of the ground with fuel stacked and heaped around the vessels. The cross-sections of sherds, particularly from larger vessels, show unoxidized carbonaceous matter, and the interiors tend to have dark or black zones. Unslipped surface colors—light to dark browns, gray-browns, and red-browns—are highly variable and uneven and fire-clouding occurs. The characteristic differences in the colors of the pastes and surfaces of the vessels, even of the same vessel, and hardness indicate variation in both clay preparation and relatively little control over firing. These remarks are highly preliminary and detailed studies of prehistoric Philippine potteries should be initiated following Scheans (1966) which for the Tabon Caves alone would be a major study.

*The Pottery Types.*—Nine pottery types, as noted, based upon surface treatment and form have been provisionally established for the Tabon Pottery Complex. The approximate percentages of these pottery types for five caves (or chambers of caves) representing the Late Neolithic, the Early Metal Age, and the Developed Metal Age are set forth in Table VII.

The following descriptions of the provisional pottery types are brief and general, stressing the distinctive features of the pottery for comparative purposes. Detailed descriptions will be presented in subsequent site reports or in special studies by other students.

#### TABON PLAIN

Plain vessels, as defined, were simply scraped, smoothed, and unslipped (slipped but unpolished pieces which are difficult to distinguish may in some instances be included in this category). The surfaces of jars with thick walls are often uneven, and sand tempering and other non-plastic materials protrude into the surface areas.

Table VII

#### APPROXIMATE PERCENTAGES OF POTTERY TYPES FROM SELECTED TABON CAVES

Vessel Count and Pottery Types	C	A	V	E	S
	Manunggul (Chamber A) Late Neolithic	Duyong Early Metal Age	Manunggul (Chamber B) Developed Metal Age	Diwata* Developed Metal Age	Pagayona Developed Metal Age
Vessel Count	78	200	37	128	40
Plain	42	25	60	20	48
Polished	9	22	22	35	20
Impressed (Cord marked or carved paddle impressions on body)	21	41	0**	6 (?)**	2**
Incised	1	2	—	15	—
Painted	14	—	—	—	—
Organic Glazed	—	1	—	4	—
Incised and Impressed	9	5	—	8	4
Incised and Impressed: Painted	2	1	—	—	—
Incised and Painted	2	3	—	1	—

\* Data from Bernardo and Viola (1965).

\*\* Cord marked or carried paddle impressions are absent or rare in developed Metal Age pottery, although designs impressed on the lip of vessels are common during all historical periods of the Tabon Pottery Complex. Some sherds with body impressions are clearly associated with the pottery of the jar burial assemblage of Diwata Cave. Other highly eroded sherds with cord marking and paddle impressions are apparently from an earlier period of use of this cave.

Although many forms and sizes of this generally undistinguished ware occur, it is usually found in larger vessels such as jars and covers for jars. The bodies of jars are commonly cylindrical or ellipsoidal in shape with rounded bottoms and restricted necks, but jars with spheroidal bodies and flat bottoms are also encountered. The latter are possibly more frequent in the earlier pottery, and jars of the early phase of the Late Neolithic are relatively small. Characteristically, the jars have flaring lips which may be either concave or convex on the upper surface to accommodate lids. In all caves, *Tabon Plain* forms a major type numerically, being exceeded in a few caves by only *Tabon Polished* and/or *Tabon Impressed*. (see Table VII).

#### TABON POLISHED

Polished vessels are common and form another major pottery type. The polished wares are usually slipped and have an easily detected lustre, but lightly polished vessels (unslipped?) with a matte finish are encountered. Polishing marks are not prominent, as in the Calatagan earthenwares (Fox 1959b), except when combined with paddle impressions where they form vertical marks on the upper body. These polishing marks were probably decorative in intent.

Red, yellow-brown, and orange-brown slipping occurs and may be found on the exterior of vessels, as in the case of covers and independently restricted vessels with high necks; on only the interior of bowls; or on both the exterior and interior surfaces which is common in the angle-bodied wares. Vessels with a colored slip are highly polished having a mirror-like gloss. Red-slipped vessels appear to be characteristic of all periods from the Late Neolithic to the Developed Metal Age and in general are a better made pottery with thinner walls.

#### TABON IMPRESSED

Designs impressed upon the plastic surface of the vessel with a carved paddle or bound paddle, as well as designs impressed with a simple tool upon lips, shoulders, or flanges (fillet) of vessels, form a third major pottery type. *Tabon Impressed* may equal and exceed in number *Tabon Plain* and *Tabon Polished*, distinguishing the Tabon Pottery Complex from other prehistoric potteries found in the Philippines. And, *Tabon Impressed* usually exceeds incised potteries in number wholly unlike the Kalanay Pottery Complex.

This pottery type, as presently established, includes designs (and utilitarian) impressions made with both a carved and bound paddle (or stick) or with a simple tool.

*Carved Paddle Impressions.*—Carved paddle decoration, as Solheim (1964a) describes, is achieved by carving a negative design onto the surface of a paddle. Ethnographic examples of carved paddles are found in the collection of the National Museum which were obtained among the Subanum of Mindanao [Solheim (1952) 35], and carved paddles (each side of the paddle had a different design) were used prior to World War II by the local Pala'wan population.

The common designs which were impressed, evenly or irregularly, upon the bodies of vessels excavated in the Tabon Caves include: (a) squares of various sizes, rectangles, and diamonds (the so-called "checker" or "rhombus" patterns); (b) ribbed (or "grooved") and cross-ribbed impressions; and (c), though rarely, combination of ribbed patterns with other impressed designs (Figs. 21 and 22). Frequently, impressed designs were wiped or smoothed before firing which obliterated much of the design.

The author has been puzzled as to why the paddle impressions were deliberately obliterated to partially remove the surface design. Mr. J. R. Specht, a visitor to Manila, has suggested that it might have been done to achieve symmetry of irregular contours. At least, the casualness with which impressions were treated is further evidence that impressions were made in part for utilitarian purposes and not wholly for decoration.

Vessels with designs on the rims, corner points [Shepard (1957) 226], and flanges which had been impressed with a *simple tool* are typical of all periods, Late Neolithic to Developed Metal Age. The portion of the rim impressed with a design is related to the form of the rim (Fig. 23); on vessels which have flaring rim, the design is impressed on either the inner or upper edge; on those with a straight neck, on the outer edge (Fig. 22). Scalloping of rims, although uncommon, also occurs.

Basket impressions have not as yet been encountered in the pottery of the Tabon Caves, but the presence of basket-marking in the Niah Pottery Complex of nearby Borneo would suggest that it will likely be found in Palawan. One pottery coffin from Manunggul Cave (Chamber A) had a mat impression.

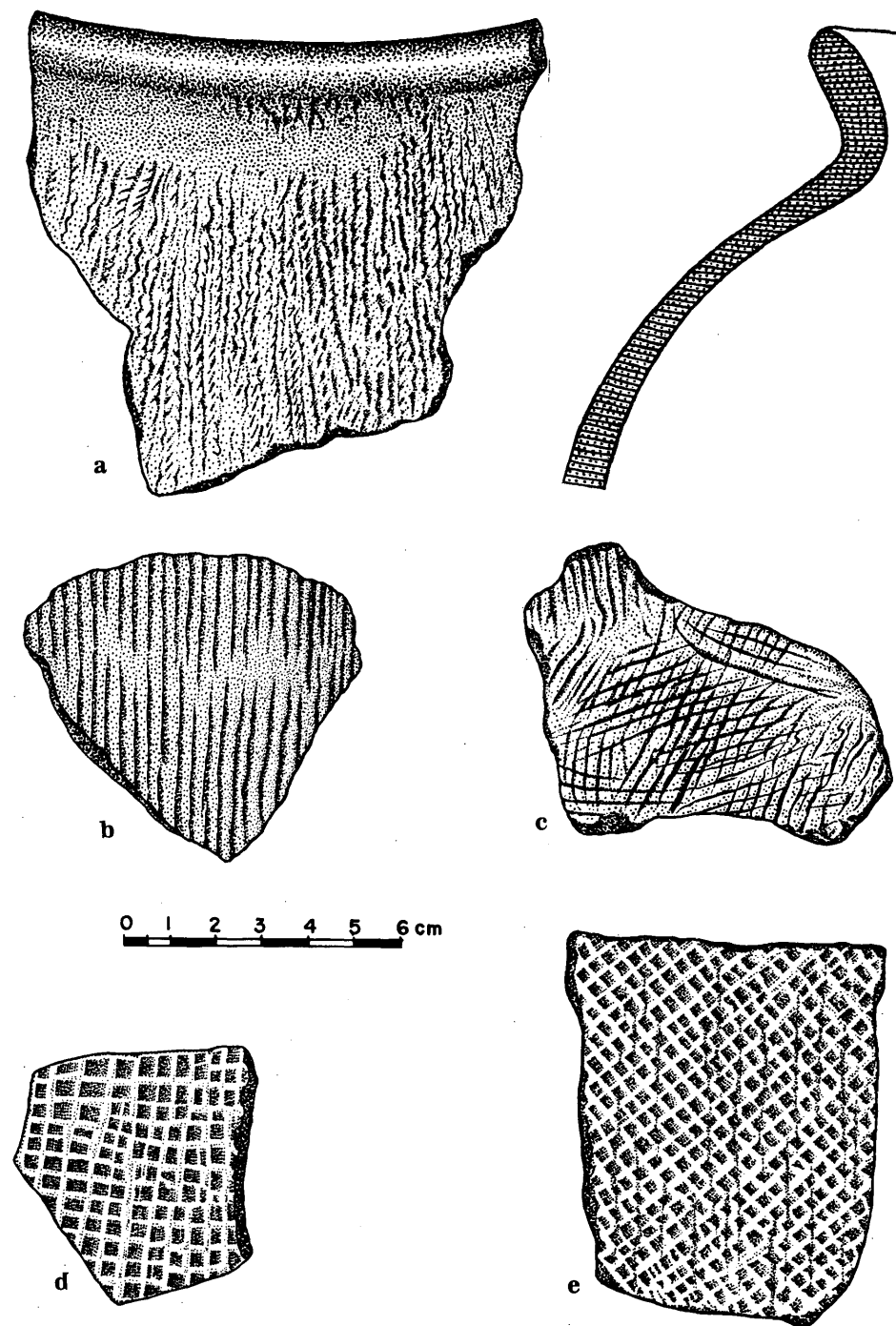


Fig. 21. *Tabon Impressed*: Representative sherds from Duyong Cave of this pottery type, including bound paddle and carved paddle.

*Cord Marking.*—Cord impressions made with a bound paddle (or stick) are also common. These are achieved (Solheim 1964), it would appear, by wrapping a paddle with twine of various sizes and spacings. The cord design was then transferred to the plastic surface of the vessel by paddling which produces negative impressions. It has been suggested that cord marking could also be produced by rolling a bound stick across the surface, but no ethnographic examples of this technique from the Philippines are known to the writer. Two common variations of cord making are encountered: (1) vertical, evenly spaced impressions on the body of the vessel; and (2) impressions which tend to be irregularly spaced and made at an angle to the body (Fig. 21-a and 21-c). Crossed cord marking is also seen but is rare.

Small angle-bodied vessels are sometimes cord impressed from the "corner point" over the entire base (Plt. XV). It may well be, as Peacock (1959: 149) notes in his discussion of Malayan pottery, that cord marking was "...more utilitarian than decorative in intent..." for it provides a more secure grip. This could also be true for the angle-bowls from the Tabon Caves which were apparently more for household than ritual use. Examples of *Tabon Impressed* occur largely on smaller spherical and angle-bodied vessels—utilitarian forms—but there are a few large jars with irregular spaced rib impressions.

It is noteworthy that cord marked vessels are most characteristic of the earlier pottery from the Tabon Caves—Late Neolithic and Early Metal Age—which suggest significant relationships with the pottery of Malaya [Peacock (1959) 149] where it forms the most common prehistoric type. It is also present in Borneo [Wall (1962) 425]. Cord marking is absent or very rare, on the contrary, in the Metal Age sites of the central and northern Philippines (e.g., the Kalanay Pottery Complex), and had probably disappeared in Palawan by Chinese contact, about the 11th century A.D. Cord marking appears to have been fading out in Palawan, during even the Developed Metal Age.

#### TABON INCISED

Vessels with only incised designs—these are distinguished from impressed designs in being cut into the surface of the unfired clay and producing sharp ridges on the edges of the incisions—are relatively uncommon. The incised designs are made with either (1) a *simple tool* (e.g., a pointed instrument of bamboo or wood),

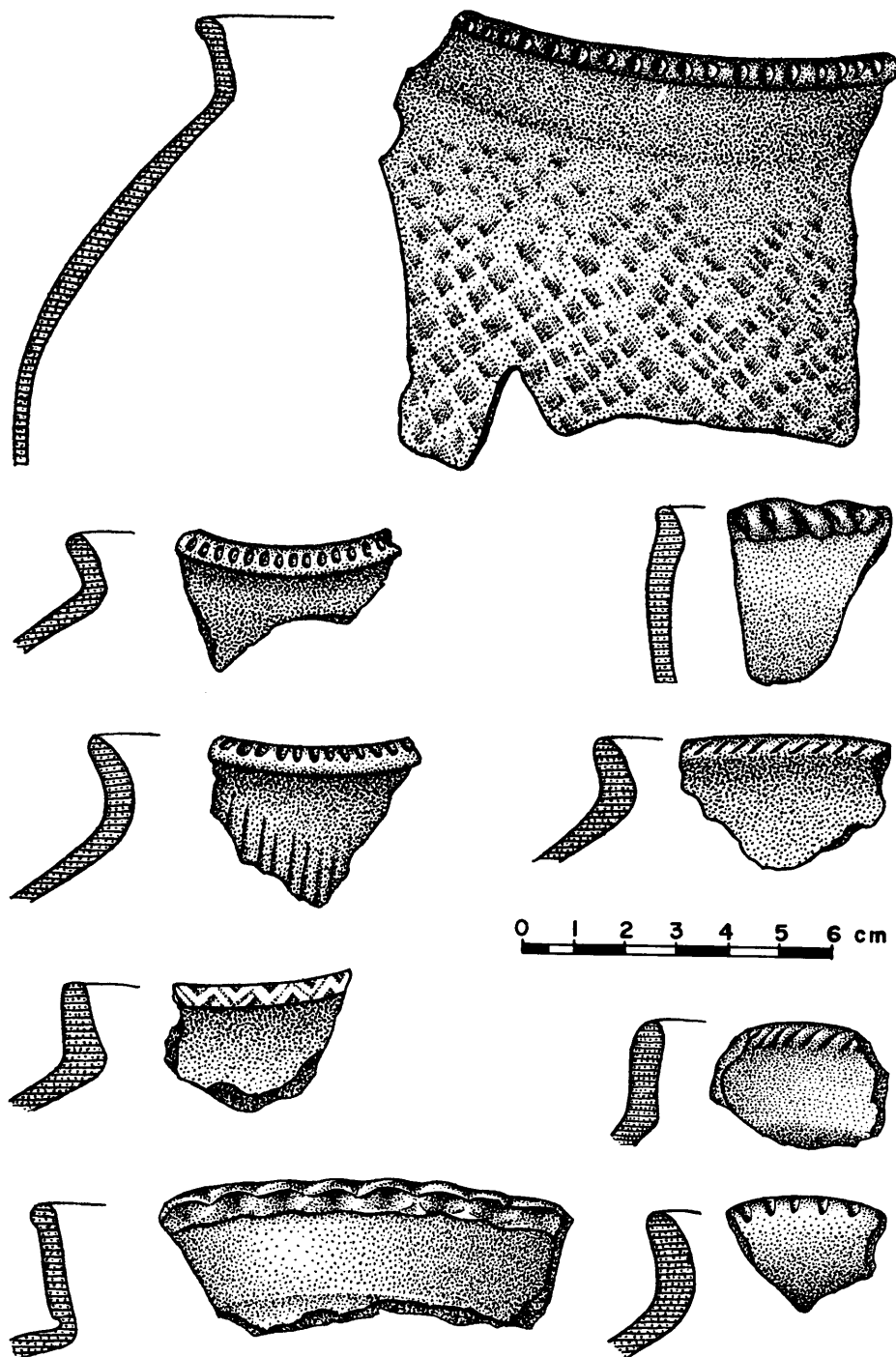


Fig. 22. **Tabon Impressed:** Examples of Rim Impressions and Scalloping of this pottery type from Duyong Cave.

or (2) a *multiple pointed tool* (Solheim 1964) which could produce comb-like designs (Fig. 24-a).

Some of the types of designs which were incised with a simple tool include: (1) radiating lines (rare), (2) cross-hatching, (3) circles, (4) diamonds in bands, (5) curvilinear scrolls, and (6) variations of the triangle. A few freely drawn zoomorphic and floral patterns were encountered. Scrolls and triangles form the most common incised design, and are frequently combined with dashes incised (or impressed) within the scrolls or in triangles (Fig. 23). An inlay of lime was sometimes found in the lines of the incised designs. Wave and scroll designs between bands, were made with multiple pointed instruments having two or more prongs. (Fig. 23-a). These are relatively rare.

#### TABON INCISED AND IMPRESSED

Lineal, scroll, and triangular design elements incised with a simple tool were sometimes combined with impressed designs. The impressed designs were usually placed within incised lines or within other incised design elements, such as triangles, and include: (1) hole-like marks made with a pointed instrument; (2) wavy marks made with the edge of an *Arca* shell; (3) dashes (these were incised as well as impressed); (4) chevron-like impressions, particularly on flanges and lips; (5) punctations, and others, all of which emphasized and heightened the effect of the design patterns. Incised designs made with simple or multiple pointed tools on the shoulders of vessels (i.e., above the corner point of vertical tendency of restricted vessels) were also combined with cord marking or carved paddle impressions on the lower portion of the body (Fig. 27-c).

The most attractively decorated pieces are *Tabon Incised and Impressed* (sometimes, as will be seen, with painting in hematite between lineal bands), but this pottery type is uncommon (see Table VII); never constituting more than 10 per cent, usually much less, of the vessels in any cave.

#### TABON PAINTED

The inclusion of this type is perhaps unjustified, for it has been found with certainty only in Manunggul Cave, Chamber A, where pottery surfaces were relatively protected from fading and decay. At least nine vessels—jars, covers, and the pottery coffin

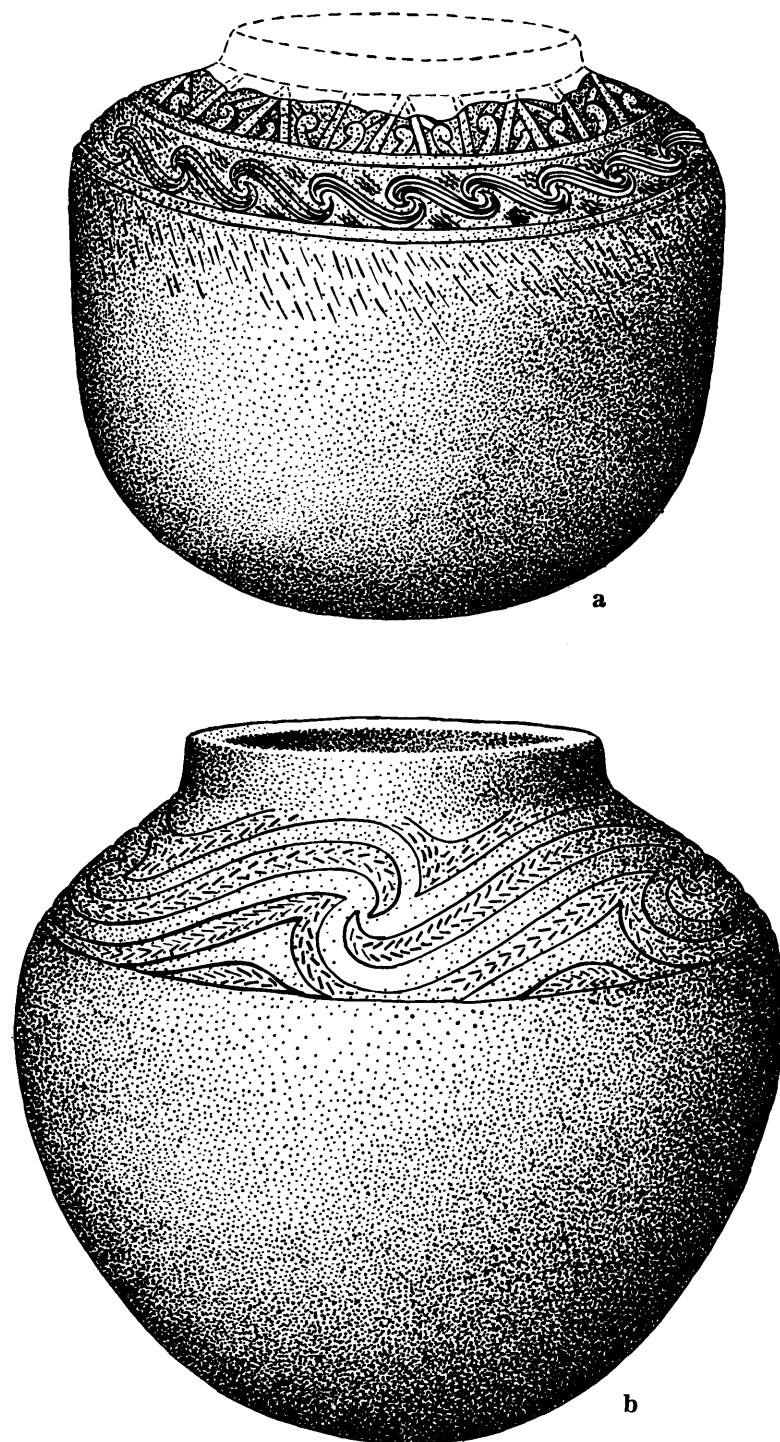


Fig. 23. Two Burial Jars from Manunggul Cave (Chamber A).

—in this cave were completely painted with hematite after firing. Other caves have also yielded large sherds which were painted with lime (?) after firing. Unfired painting with hematite and lime (?) may actually have been more common, but disappearing as the result of fading and decay where vessels and sherds have been exposed. Painting with hematite after firing was usually combined with incised or incised and impressed designs.

One spherical vessel, chipped around the lip, was excavated in Manunggul Cave (Chamber A) which has criss-crossed lines in white around the body forming diamond patterns (Plt. XV-a). This unique vessel was painted either before firing or after firing with secondary heating.

#### TABON ORGANIC GLAZED

One large vessel—probably a burial jar for it has a flange below the rim to support a cover—which had been glazed with a translucent organic substance giving the surface a distinct sheen was excavated in Duyong Cave. The glaze had apparently covered the entire body of the jar. A number of examples of *Tabon Organic Glazed* were also recovered in Tabon, Diwata, and Tadyaw Caves on Lipuun Point. In these latter caves, the glaze was used to form vertical, decorative bands on the bodies of large jars.

Although no laboratory identification has been made, it is certain that the material used for the glaze was a resin called *bagtik* locally and “Almaciga” or “Manila Copal” commercially which is obtained from a high altitude tree (*Agathia philippinensis* Warb.) in Palawan. Until metal cooking pots became common in recent years, the local Tagbanwa made pottery which was sometimes glazed with Almaciga (Fox 1954). Chunks of Almaciga have also been excavated in the Tabon burial caves.

#### TABON INCISED AND PAINTED AND TABON INCISED AND IMPRESSED: PAINTED

Vessels of these two pottery types are rare (Table VII) and were apparently highly prized, for sometimes only sherds of these pottery types were placed in the burial cave. The hematite was usually painted between incised lines or within incised design elements (see Frontispiece and Figs. 25 and 33). A few sherds were recovered with painting separating incised bands, notably when incised or impressed design elements (e.g., dashes) had been drawn within the bands.



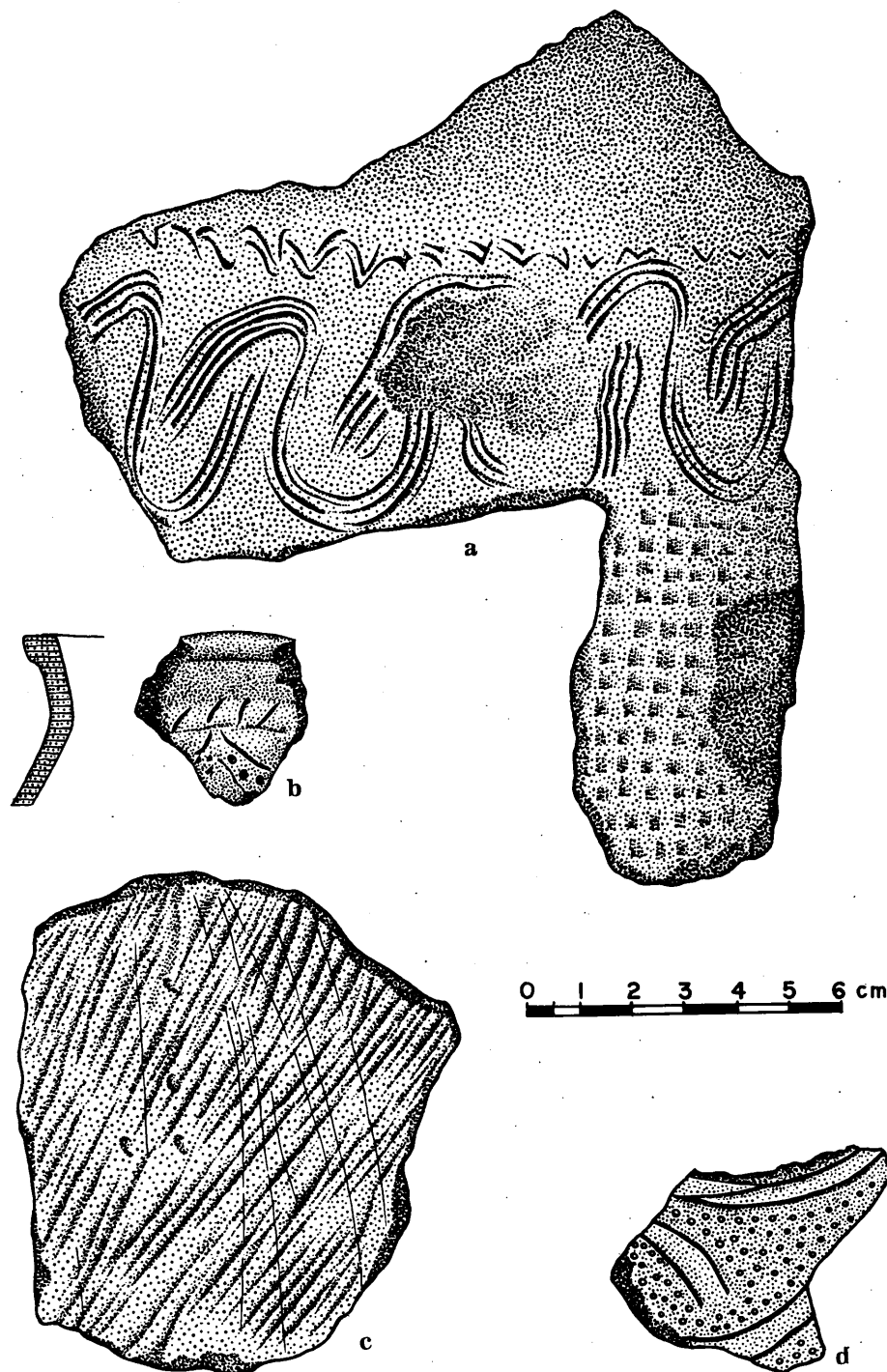


Fig. 24. Tabon Incised and Impressed: Representative Sherds of this Pottery Types from Duyong Cave.

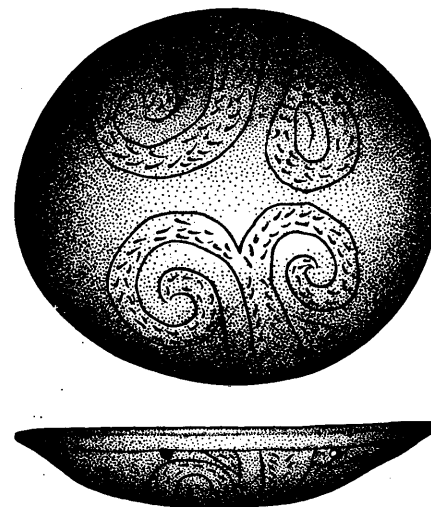


Fig. 25. Tabon Incised and Painted: a shallow bowl with four holes near the rim, probably for suspension during rituals.

As based upon a comparative study of the pottery from eleven Tabon Caves (see also Table VIII), these two pottery types are confined to the earliest phases of the Tabon Pottery Complex, the Late Neolithic and Early Metal Age, and fade out or disappear entirely during the Developed Metal Age when iron was present. The Late Neolithic at Niah is also associated with painted pottery, a "Three Colour Ware" [Solheim, Harrison, and Wall (1961) 172].

*Vessel Forms.*—The characteristic vessel forms of the Tabon Pottery Complex are shown in Figure 26, and outlines of all of the vessels found on the surface of Pagayona Cave are set forth in Figure 44. Other unusual vessel forms are shown in Figure 15, 27, and 33. Primary emphasis is placed on the description of the forms of jars and covers which dominate the pottery of this jar burial complex. The common and *diagnostic* form classes are as follows (the descriptive categories are tentative and no attempt has been made to describe in detail all of the forms):

(1) Jars:

- a. Cylindrical jars with rims which project inward or outward to support covers; flat bottoms (Fig. 26-a).
- b. Ellipsoidal or spheroidal jars with flaring rims, either concave or convex, and rounded bottoms (Fig. 26-b-c, and d). Covers fit into the concave rims.
- c. Ellipsoidal or spheroidal jars with relatively restricted orifices, flat shoulders, in-sloping necks and plain lips; rounded bottoms (Fig. 26-e).
- d. Ellipsoidal or spheroidal jars with short, slightly flaring or straight necks and plain lips; rounded bottoms (Fig. 26-f).



- e. Ellipsoidal or spheroidal angle-bodied jars with high corner points and an in-sloping shoulder above the corner points; plain lips and rounded bottoms (Fig. 26-g). Covers fit over the rims and on the shoulders of these jars.
- f. Others.

A decorated fillet at the throat (the angle of the juncture of the neck and body) of jars are common. Lips also have impressed or incised designs. One small angle-bodied jars from Manunggul Cave has a ring-foot. Jars and covers were tied together by means of (a) lugs with one or two perforations which were oriented either vertically or horizontally on the upper body of the jar and the lower portion of the cover (Fig. 15); (b) simple holes through the corner points of jars and covers; and (c) handles on both jars and covers. Horizontal handles are encountered on covers which are a part of a moulded flange on the lower portion of the cover.

Forms of the necks and lips of jars were greatly influenced by the use of jar covers. In fact, jars and covers were potted in some cases at the same time. They show similar clay and temper and have the same surface finish, as well as fitting together perfectly. Jars are largely Tabon Plain, as noted, but examples are found in all of the nine tentative pottery types.

#### (2) Jar Covers:

- a. Trunconical covers with sweeping unrestricted contours; or a sharp angle at the base with an in-turning rim. These covers may fit over the neck or into a concave rim of the jar (Figs. 26-h, 26-i, and 26-j).
- b. Ovaloid, sometimes spheroidal, bowl-like vessels with plain lips, inverted over the orifices of jars [described as vessel forms with "simple and dependent restricted" shapes and "simple contours" by Shepard (1957) 231]. These vessels frequently show chipping around the edge of the lips probably to enlarge the mouth to fit over the necks of jars. Necks of jars were likewise chipped, even removed, to accommodate covers. It is possible that these vessels were not always made as covers *per se*, being only large utilitarian bowls (Fig. 26-k, and 1).
- bb. Ovaloid, sometimes spheroidal, bowl-like vessels with corner points and in-turning "rims" (Fig. 26-m).

- c. Flat covers (Fig. 26-n).
- d. Miscellaneous covers with knobs, tripod arrangements possibly to support smaller vessels, and figurine covers (Frontispiece and Fig. 33).

Jar covers generally fall into the category of *Tabon Plain* but examples of other types occur including *Tabon Polished*, *Tabon Incised*, *Tabon Painted*, and *Tabon Incised and Impressed: Painted*. It is noteworthy that impressed and incised designs are rarely found on covers, these decorations being used primarily on vessel bodies. The trunconical covers show striking similarities with the pottery from Sa-huynh, Indo-China (Figs. 29 and 49).

#### (3) Bowls:

- a. Simple bowls; unrestricted vessels with simple contours and plain lips; round bottoms are characteristic, flat bottoms rare (Figs. 26-o, 26-p, and 27).
- b. Spheroidal or ellipsoidal shaped bowls; dependent restricted vessels with simple contours and everted lips, convex or concave; round bottoms (Fig. 26-q, 26-r, and 26-s).
- c. Angle-bodied (Wall 1962) or bi-conical (Peacock 1959) bowls; dependent restricted vessels with composite contours, everted lips, and round bottoms; the corner point may be high, mid-way, or low on the body of the vessel which gives them distinct forms (Figs. 26-t, 26-u, and 26-v). These are common forms of small bowls. A relatively few angle-bodied bowls are slightly unrestricted, the tangent at the lip being a little greater in diameter than the diameter at the corner point (Plt. XV).
- d. Angle-bodied bowls with high corner points and in-curving or in-turning "shoulders" on the upper body or on rims; flat or round bases and plain lips; rare (Fig. 26-w and 26-x).
- e. Carinated bowls [Peacock (1959) 128]; unrestricted vessels with flaring lips and high corner points; round bottoms; rare (Fig. 26-y).
- f. Others.

The simple bowls are usually plain; a relatively few polished. The angle wares, on the contrary, are polished and frequently have incised designs on the upper body (i.e., above the corner point) and/or impressed designs on the lower body and base (Fig. 27). Carinated forms are normally *Tabon Polished*. The vessels with in-turning upper bodies or rims are usually polished or have incised designs on the upper body.

(4) Independent Restricted Vessel [Shepard (1957) 250-231] or "pots" with distinct necks and restricted orifices:

- a. Ovaloid or spheroidal shapes with composite contours, short necks, and everted lips (Fig. 26-z).
- b. Spheroidal vessels with composite contours, relatively short necks, and plain lips (Fig. 26 z-1).
- c. Spheroidal vessels with inflected contours, short neck, everted lips, and round or flat bottoms; sometimes a moulded ridge occurs just above the point of vertical tangency (Fig. 26 z-2).
- d. Spheroidal vessels with complex contours, high corner points (sharp or rounded), short necks, exerted or plain lips, and round or flat bottoms (Fig. 26 z-3).
- e. Others.

All of the pottery types, except *Tabon Incised and Impressed; Painted*, are represented by these forms of independent restricted vessels. They are not commonly found in the caves probably because they were utilitarian forms and not usually associated with funerary pottery.

Other less frequent but diagnostic form classes include:

(5) Footed Vessels:

- a. Goblets (Fig. 26 z-4).
- b. Simple bowls with ring feet (Fig. 26 z-5).
- c. Angle-bodied footed vessels (Fig. 26 z-6).
- d. Others (Fig. 27).

(6) Boxes with covers (Fig. 27).

(7) Miscellaneous:

- a. Spouted vessels (Fig. 45).
- b. Coffin with square body and rounded cover.
- c. Others.

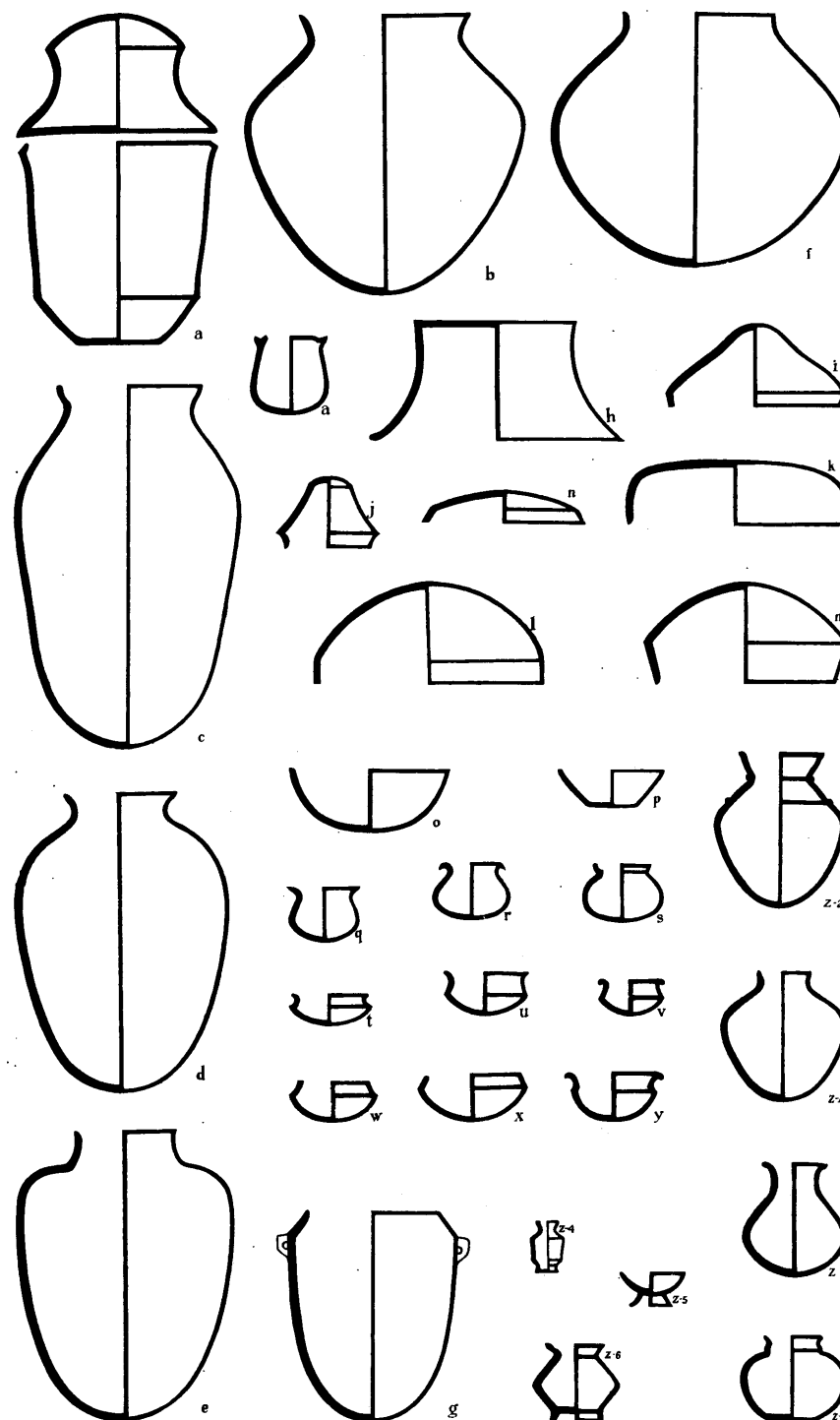


Fig. 26. Some Vessel Forms of the Tabon Pottery Complex.

The footed vessels sometimes have two holes or perforations on opposite sides of the foot. Similar arrangements of holes are diagnostic of the Developed Metal Age potteries of Batangas Province and elsewhere. Footed vessels with "cut-out" or carved designs are very rare when compared with the footed vessels from the Calamianes Islands, the Metal Age Pottery of Batangas Province, and the Kalanay Pottery Complex [Fox (1959a) Plt. 2; Solheim (1959a) Plt. IV-e] No vessels with legs, tripod or tetrapod, have been excavated; or double spouted vessels with stirrup handles. The former occur in Malaya and the central Philippines and the latter in Borneo.

*Relationships of the Tabon Pottery Complex.*—It would appear certain, as Solheim (1959c: 186-187) has set forth, that a widespread pottery tradition existed in Southeast Asia to which the pottery complexes of Sa-huynh in Indo-China, Niah in Borneo, Kalanay in the central Philippines, and others still undescribed show genetic relationships. This preliminary study would also indicate that the Tabon Pottery Complex has relationships with this widespread pottery tradition. Suggestions as to the specific time-and-space relationships of the Tabon Pottery Complex with this tradition are considered below. There were certainly other pottery traditions in Southeast Asia, however, as shown by the pottery of Malaya and that found by the Thai-Danish excavations in Thailand (Sørensen 1967) to which the Tabon Pottery Complex may also have genetic ties. This is suggested by the presence of cord marking in the pottery of Thailand, Malaya, Borneo, and Palawan, and its absence in the Kalanay Pottery Complex.

This pottery tradition, according to Solheim (1959: 187), appeared during the Late Neolithic by 1000 B.C. or earlier. The excavations in Manunggul Cave, Chamber A, which contained a pottery related to this tradition, yielded two C-14 dates of 710 B.C. and 890 B.C., indicating a Neolithic date for the first appearance of this tradition. The writer is assigning an even earlier date to the pottery of Leta Leta Cave, El Nido, about 1500 B.C. This tradition appears, however, to have spread into and throughout the Philippines primarily in association with the early metals and iron and not during the Neolithic, although it first appeared during the Neolithic. And, the tradition appears to have developed with numerous local specializations after iron had become thoroughly established in the Philippines.

This pottery tradition would also appear to have been distributed by the actual movements of people, as Solheim (1959b: 186-187) early argued, a view which is strongly supported by the excavations in the Tabon Caves. The writer would like to add that the Palawan data indicate numerous movements of the people into this area who,

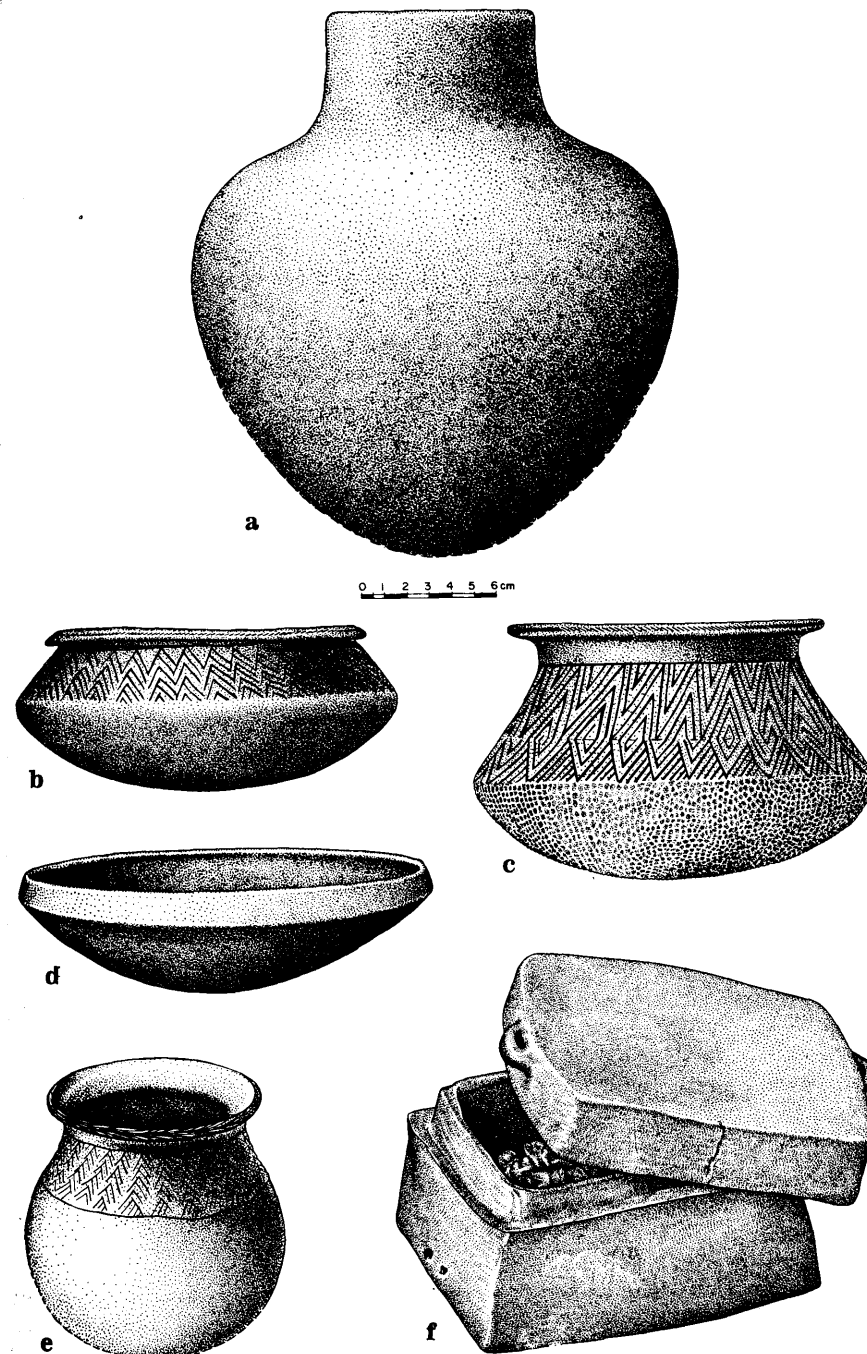


Fig. 27. Examples of Vessel Forms and Decorations of the Tabon Pottery Complex: (a) an example of Tabon Polished with highly burnished red slip, and unusually tall, restricted neck; from Diwata Cave; (b) angle-bodied Tabon Incised vessel from Diwata Cave with incised designs above the corner point; (c) Angle-bodied bowl from Diwata Cave with incised designs above the corner point and paddle impressed designs over the lower body and base; (d) an example of Tabon Polished, from Diwata Cave with unusual interturning rim; (e) further example of a vessel belonging to the pottery type Tabon Incised from Duyong Cave; (f) an unusual cover box from Bato Puti Cave which contained the painted teeth of more than one individual.

although making pottery broadly related to this tradition, brought with them distinctive assemblages of tool and ornaments which vary from one time period to another. It is, in fact, the larger objective of this study of the jar burial assemblages excavated in the Tabon Caves to discuss the total corpus of artifacts, not simply the pottery, which accompanied the successive movements of people into Palawan.

The comparative data, as both Solheim (1959: 186) and Wall (1962: 427) have stressed, would not indicate that the dispersal of this pottery tradition was through recurring trade, the result of "waves of migrations," or that the various pottery complexes which are related to this tradition "depended" | Wall (1962) 427 | upon each other for their development. Rather, the related pottery complexes appeared to have developed by and large independently from one another, showing many local specializations and elaborations in form and designs. Thus, the pottery of the Tabon Pottery Complex displays unique features and lacks as well some of the characteristics of probably related pottery found in neighboring areas.

The early prehistoric potters were usually fine technicians and not infrequently superb artists, in sharp contrast to the contemporary folk potters in the Philippines. The earlier people lived in a socio-cultural setting in which pottery had innumerable functions and uses—social and religious as well as utilitarian. Individual expression among the early potters was obviously expected, as shown by the great variety of forms and designs of the vessels produced, including some magnificent pieces (see Frontispiece).

There are, as noted, persisting features in the forms, methods surface treatment, and technique of manufacture of at least four pottery complexes which are widely scattered in Southeast Asia—Sa-huynh, Niah, Kalanay, and Tabon—pointing clearly to a shared tradition [see Table I, Solheim (1959b) 183]. But, the specific details

<sup>5</sup> The writer is choosing to ignore in the body of this report a recent publication by Solheim (1964b: 196) in which he has made a "major correction" in his analysis of the pottery from a site in Palawan, changing it from the Bau Pottery Complex to the Kalanay Pottery Complex and thereby adding "...impressed: carved paddle and possibly [see below] impressed: bound paddle to the inventory of early Kalanay pottery." This "major correction" is not justifiable on the basis of the archaeological data. The complete assemblage of artifacts from this site indicates that this "major correction" cannot be accepted as valid.

It has been apparent from Solheim's many excellent publications on South-east Asian pottery that he has been concerned with the absence of cord marking and paddle impressed "designs" in the Kalanay Pottery Complex, for these widespread methods of surface treatment are associated with the earliest pot-

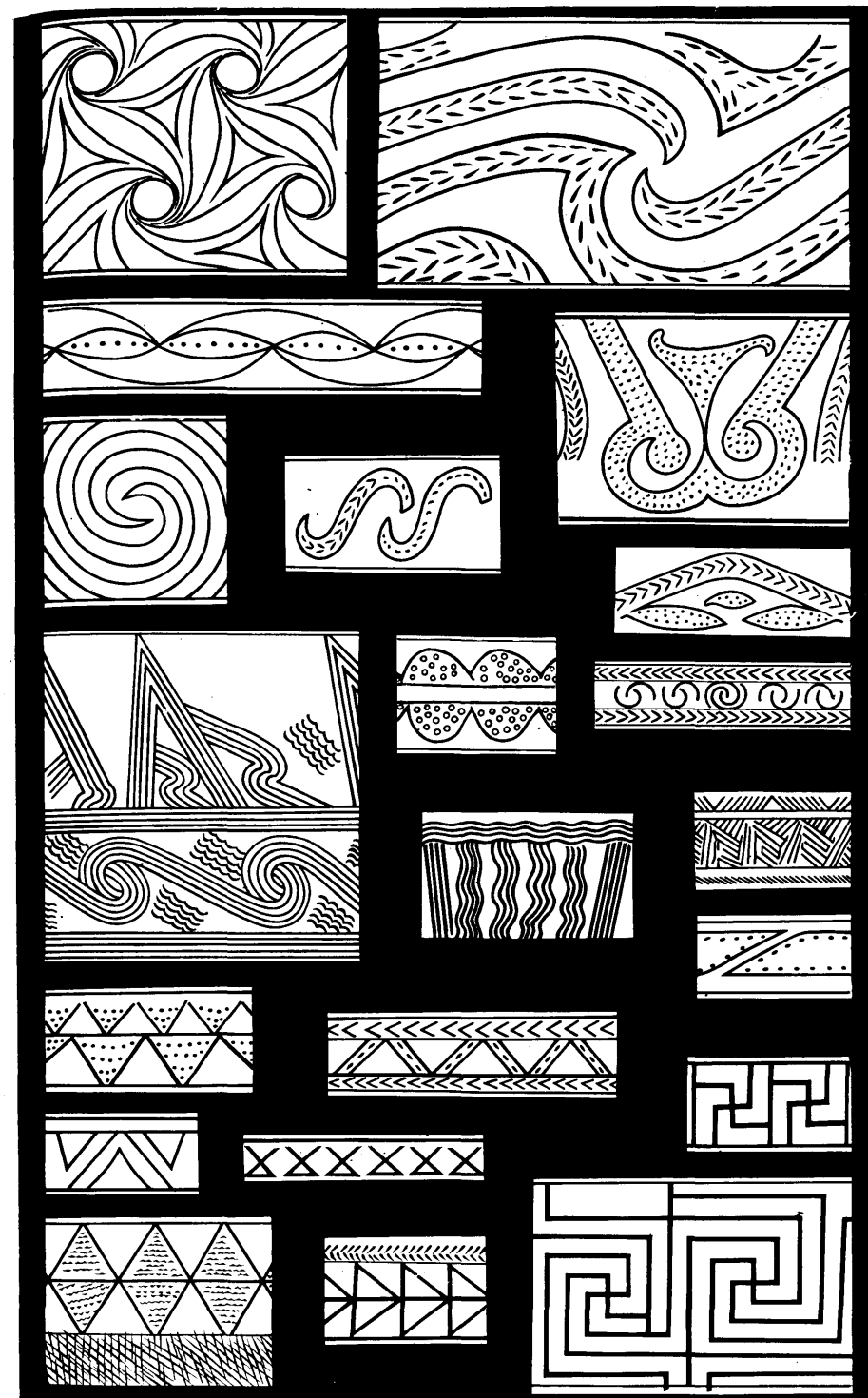


Fig. 28. Design Patterns of the Tabon Pottery Complex.

of the interrelationships of the various related pottery complexes are hazy, in particular their temporal relationships. This is due for the most part to an inadequate archaeological record. The following remarks concerning the broad relationships of the Tabon Pottery Complex are thus only highly general.

A brief comparative study would suggest that the primary ties of the Tabon Complex are with Niah in Borneo and Sa-huynh in Indo-China, less so with Malaya, Thailand, and South China; and only secondarily with the central and northern Philippines, at least as the Kalanay Pottery Complex of the Philippines is presently described by Solheim (1959a and 1964b). The primacy of the relationships of the Tabon Pottery Complex are clearly shown by the known distribution of cord marking and carved paddle decoration in Southeast Asia; specifically areas where these techniques have formed a significant element of the surface treatment.

In the Kalanay Pottery Complex of the central Philippines, carved paddle designs are "...not definitely present" and "...cord marking has not been found" [Solheim (1959a) 180]. Beyer (1948a: 75-79) early recognized the rarity of paddle marked, cord marked, and mat marked pottery in the central and northern Philippines. In knowing that these methods of surface treatment were associated with the Late Neolithic elsewhere in South and East Asia, Beyer consistently rejected a Philippine Neolithic pottery.

In Malaya and Thailand, cord marking achieved with a bound paddle (or by other means) forms probably the most common decoration in the early potteries, although carved paddle impressions are much less common [Peacock (1959) 140]. Cord marking and carved paddling are also widely encountered in South China [Finn (1958) 34-42; Maglioni 1952] and occur in Indo China [Solheim (1959b) 103]. Designs impressed with a bound paddle are "pre-

teries in Southeast Asia. If the Kalanay Pottery Complex is an early pottery complex—this would appear to be demonstrated by the C-14 date of 754±100 B.P. for Cave Number 2 at Batungan, Masbate—or the earliest pottery to reach the Philippines, than both bound paddle and carved paddle impressions would be expected in association with this pottery complex. If, on the other hand, as Solheim's many publications concerning the Kalanay Pottery Complex and as the type site itself show, this pottery complex is characteristically associated with iron and involves considerable local pottery development and specializations, then there must be (a) either early Kalanay sites which have pottery which is cord marked and/or carved paddle marked, or (b) other earlier sites with distinct pottery complexes which, however, would still be related to the larger pottery tradition to which Kalanay pottery also shows relationships. The writer's own bias, as stated, is that the

sent" in Borneo and variations of the carved paddle are "common" [Wall (1962) 425-426], and, as would be expected, surface treated by bound paddle and carved paddle has been reported from North Borneo [Williams (1962) 230-231]. Finally, as discussed above, cord and paddle impressions form a major category of surface treatment in the Tabon Pottery Complex, particularly in the pottery of the Late Neolithic and the Early Metal Age. This method of surface treatment—bound or carved paddle impressions—fades out in the fully Developed Metal Age sites when iron is present in significant quantities; and, as will be seen, impressed designs were apparently not common in the *earliest* Late Neolithic potteries. This method of surface treatment is, at any rate, the striking feature of Tabon pottery and rare or absent in the pottery of the northern and central Philippines.

Cord marked and paddle impressed surface treatment will probably be found in Luzon and the central Philippines, and certainly elsewhere in the southern Philippines. Mrs. Dorothy Main, volunteer associate in the National Museum for many years, has recently isolated a single sherd with rib impressions from a deep midden excavated by the writer, Messrs. Manuel Santiago and Leo Anthony Bennett at Dulangan, San Luis, Batangas. Comparisons of this sherd with pottery excavated in a nearby burial site at Butong, Batangas—the site had iron tools in the graves but no trade porcelains—indicates that the sherd dates from the Developed Metal Age. Cord marking and carved paddle designs were also found by Mr. Edward B. Kurjack, in association with the limestone urn burials found in caves in the Salangsang area, Cotabato Province, Mindanao (Fig. 1), and these designs have been reported from other areas of Mindanao both archaeologically and ethnologically.

Although the archaeological record from the central and northern Philippines is still extremely spotty, there are sufficient evi-

construct of the Kalanay Pottery is most useful to the archaeologist in the Philippines as describing a highly sophisticated "Iron Age" pottery which is characteristically without the elements of cord marking and carved paddle impressions.

The excavations in the Tabon Caves have clearly shown another early pottery complex—the *Tabon Pottery Complex* describe herein—which is distinct from the Kalanay Pottery Complex precisely because it has cord marking and carved paddle impressions as major pottery types (see Table VII), exceeding in number in one cave all of the other pottery types. Under these circumstances there is little need to force the categories of bound paddle and carved paddle surface treatment into the inventory of the Kalanay Pottery Complex; particularly, as in the areas of the central Philippines, as well as in the time period when the Kalanay pottery forms a diagnostic complex,

dences to indicate that paddle impressed surface treatment is extremely rare in these areas. Solheim's own excavations also demonstrate the rarity of paddle impressed pottery in the central Philippines and Luzon. Thus, one of the distinguishing and consistent features of the Kalanay Pottery Complex established by Solheim, as noted above, as well as the Metal Age potteries found in western Batangas, is the total absence or rarity of paddle impressed surface treatment.

Designs common to the Kalanay Pottery Complex are absent or not typical of the Tabon Pottery Complex. Variations of the "rectangular meander" are a primary design of the Kalanay pottery [Solheim (1959a) 159] but are rare or entirely absent in the pottery of the jar burial caves at Tabon. Curvilinear scrolls form a developed design pattern in both of these pottery complexes, but are also common to all of the pottery complexes of Southeast Asia which Solheim has described as forming a widespread pottery tradition. In general, incising is more pronounced in the Kalanay pottery, as well as other Metal Age potteries of Luzon and the central Philippines, than in the Tabon wares.

these methods are either not present or strikingly rare. And, if there is a Kalanay pottery site which includes these types of surface treatment as a typical feature (such an association is possible), than it would appear reasonable to the writer for Solheim to present detailed archaeological evidences, particularly as he has made a "major correction" of an established pottery complex. Any other approach would appear as data juggling to accommodate a preconception which was certainly not Solheim's intent. The writer also feels that there has been far too much concern with pottery relationships and not enough concern with dirt archaeology, at least in the Philippines, which would establish time as well as space relationships of the pottery and their associated artifacts. An early and widespread pottery tradition in Southeast Asia to which Kalanay and Tabon pottery is related has been brilliantly established by Solheim, but what is now needed is a "historical typology" of these relationships which can be achieved only through systematic excavations.

The site which formed the basis of Solheim's "major correction" of the characteristics of the Kalanay Pottery Complex is located at El Nido (Bacquit), Palawan, and was visited by Dr. Carl Guthe over forty years ago. Dr. Guthe recovered a small surface collection from this cave—designated site C67—which include shell beads and bracelets and a few sherds, including sherds with paddle impressed surface treatment. Originally, Solheim (1964b; 147-150) was in doubt as to the relationships of this pottery which showed both Kalanay and Bau characteristics but he classified the ware and site as "Early" Bau. Upon re-examination of photographs of these materials, he has now classified the site as having Kalanay pottery and being an early Kalanay site.

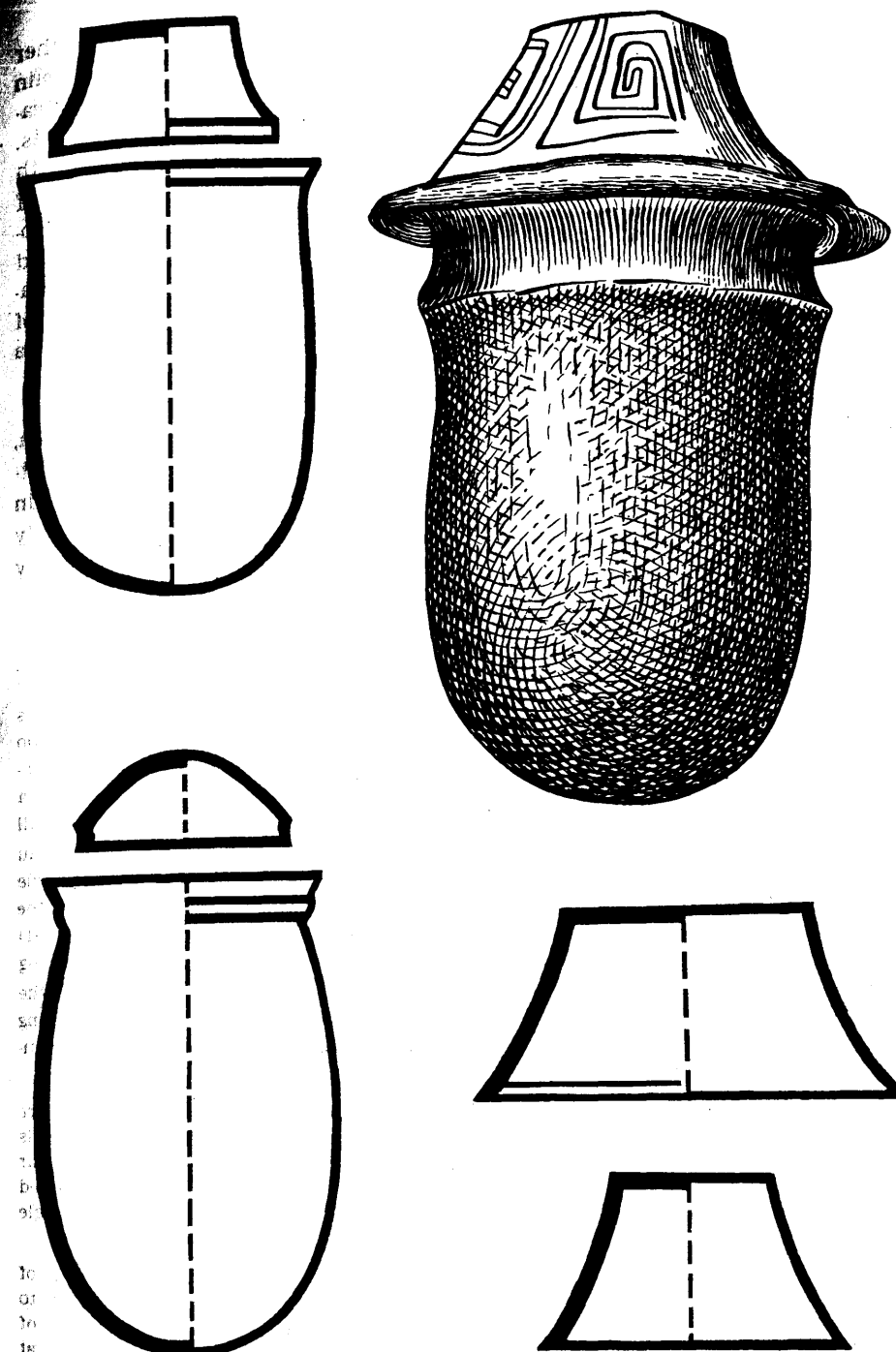


Fig. 29. Burial jars and trunconical jar covers from Sa-huynh, Indo-China (after Janse (1959) Fig. 1; and Solheim (1959b) Figs. 1 and 2) showing relationships with those of the Tabon Caves.

Facets cut on corner points, flanges, and rims form a further distinctive decoration in the Kalanay Pottery Complex, but again are either absent or rare in the Tabon Pottery Complex. Perforation or carved designs in footed vessels occur in the Tabon Caves, but in only three examples of hundreds of vessels. Vessels with carved stands, in contrast, are typical not only of the pottery of Kalanay but of the Calamian Islands and Central Luzon at Novaliches [see Beyer (1947) Plt. 14]. Designs which were impressed (or incised) with a simple tool on rims are common to both Kalanay and Tabon pottery, but these are also common features of all time periods of the pottery described by Solheim as forming a single pottery tradition in Southeast Asia.

Generally, the design elements and patterns encountered at Niah, Borneo, show the closest relationships to those of the Tabon Pottery Complex. An organic glaze of Almaciga was used both in Palawan and Borneo [Harrison (1957) 211], but this may only reflect a local specialization for the resins are common and today commercially exploited in both of these areas.

—o—

In October and November, 1965, the writer independently excavated this site (Guthe's C67; National Museum, 1965-L) while exploring the El Nido area. The site is briefly described in a following section of this report entitled "Explorations" and a detailed site report is in preparation. It is a classic Late Neolithic site with pottery. At this time only the pottery will be briefly described relative to Solheim's "major correction" of the Bau and Kalanay Pottery Complexes. First, both cord marked and carved paddle surface treatment is present but cord marking rare. Secondly, only one vessel of more than fifty (the exact vessel count has not been completed) has incised designs on the body; hardly a Kalanay trait which has incising as a characteristic feature. Impressions made with a simple tool on the rims are common. Polished surfaces are encountered. The most striking characteristic of the pottery, in contrast to Kalanay is that it is overwhelmingly *plain* or paddle impressed.

The forms too are highly distinct and include many vessels which were unquestionably used in ritual drinking. Small, flat bottomed, shallow bowls also stand out. Large vessels are rare and only a few are actually of jar size. It is not a jar burial site although jar burial is possibly present. Footed vessels occur, one having cutout (carved) designs on their ringfoot. Angle bodied wares are present. (see Plt. XVI).

The pottery shows closer relationships, as would be expected in terms of the geographical location of this site, to the Tabon Pottery Complex than to the Kalanay Pottery Complex, particularly in relationship to the presence of cord marking and carved paddle impressions. There is no justification at least for relating the pottery of Guthe's cave to the Kalanay Pottery Complex.

Forms too show closer relationships with the pottery of Borneo, Indo-China, and Malaya, than with the Kalanay Pottery Complex and the other Metal Age potteries of Luzon and the central Philippines. The similarities between the jar forms and trunconical covers of the Tabon Pottery Complex and Sa-huynh are particularly striking [Janse (1959) Fig. 1 and Plt. 1-a; and Figs. 29 and 49 herein]. Neolithic forms of pottery found in Malaya are identical to those of Tabon, including carinated bowls, simple bowls with flat bottoms, footed goblets, and others (see Peacock 1959). Angle-bodied vessels which have cord marking below the corner point and over the entire base are found in Malaya, Borneo, and in the Tabon Caves.

The more massive footed vessels of Kalanay, as well as tripod and tetrapod forms, are entirely absent in Palawan. These are also widespread in the early potteries of the Mainland of Asia and would be expected in the Tabon Pottery Complex. This again emphasizes the local developments and elaborations of forms and designs which characterized the various local pottery complexes.

The implications to the culture history of Palawan and the Philippines generally, as suggested by these brief remarks on the pottery, will be considered again when the characteristics of jar burial and the Tabon Pottery Complex are discussed through time. But it should be noted here that the Kalanay Pottery Complex is *typically* Developed Metal Age, after iron was established; the Tabon Pottery Complex, Neolithic and Early Metal Age.



## CHAPTER VI

### THE CULTURAL ASSEMBLAGES OF SIX JAR BURIAL CAVES AND CHRONOLOGICAL DEVELOPMENTS

A detailed comparative study of artifacts, including pottery types, from six of the Tabon Caves—Ngipe't Duldug, Manunggul (Chambers A and B), Duyong, Uyaw, Pagayona, and Tadyaw—follows and provides specific temporal details on the practice of jar burial, as well as a general picture of technological and cultural developments in Palawan from the Late Neolithic to the Developed Metal Age. Pertinent data from a number of other caves excavated also will be evaluated in the discussion of the cultural assemblages from these six jar burial sites.

#### NGIPE'T DULDUG CAVE

This cave is small, six meters in length and about three meters in width. The surface areas around the edges of the cave are formed by sloping limestone shelves with no deposits. The deposits and cultural materials were restricted to the center and front center of the cave and reached a maximum depth of about 70 cm. (Fig. 30). The deposit was not stratified and it would appear that the jars and other vessels had originally been placed on the limestone shelf around the edges of the cave and then tumbled down into the depression in the center of the cave. The cave is located on the east side of Lipuun Point facing Malunot Bay (Fig. 5) and is approximately 250 feet in elevation above sea level. The cave was completely excavated and the deposits screened with 1/8 inch wire mesh.

Sherds of at least eight vessels were recovered, including four *small* burial jars with a plain, smoothed surface. One jar has a relatively straight neck and an ellipsoid shaped body (Fig. 31). Another small vessel has an impressed design on the rim, and a reconstructed bowl has straight, flaring sides and a flat base similar to vessels found in Neolithic sites in Malaya [Wall (1962) 419]. One distinctive vessel has a highly polished red slip and a flaring ring-foot, an impressed line-and-punctuate design being found on the outer edge of the rim and the edge of the ring-foot (Fig. 31). Typologically, the Ngipe't Duldug earthenwares fall into three groups: *Tabon Plain*, *Tabon Polished*, and *Tabon Impressed*. The vessel count from this cave is too small for definitive observations on this pottery which is probably the earliest pottery found in the Tabon Caves. However, the recent excavations of a Late Neolithic site, Leta Leta Cave, at El Nido, Palawan, yielded a large number



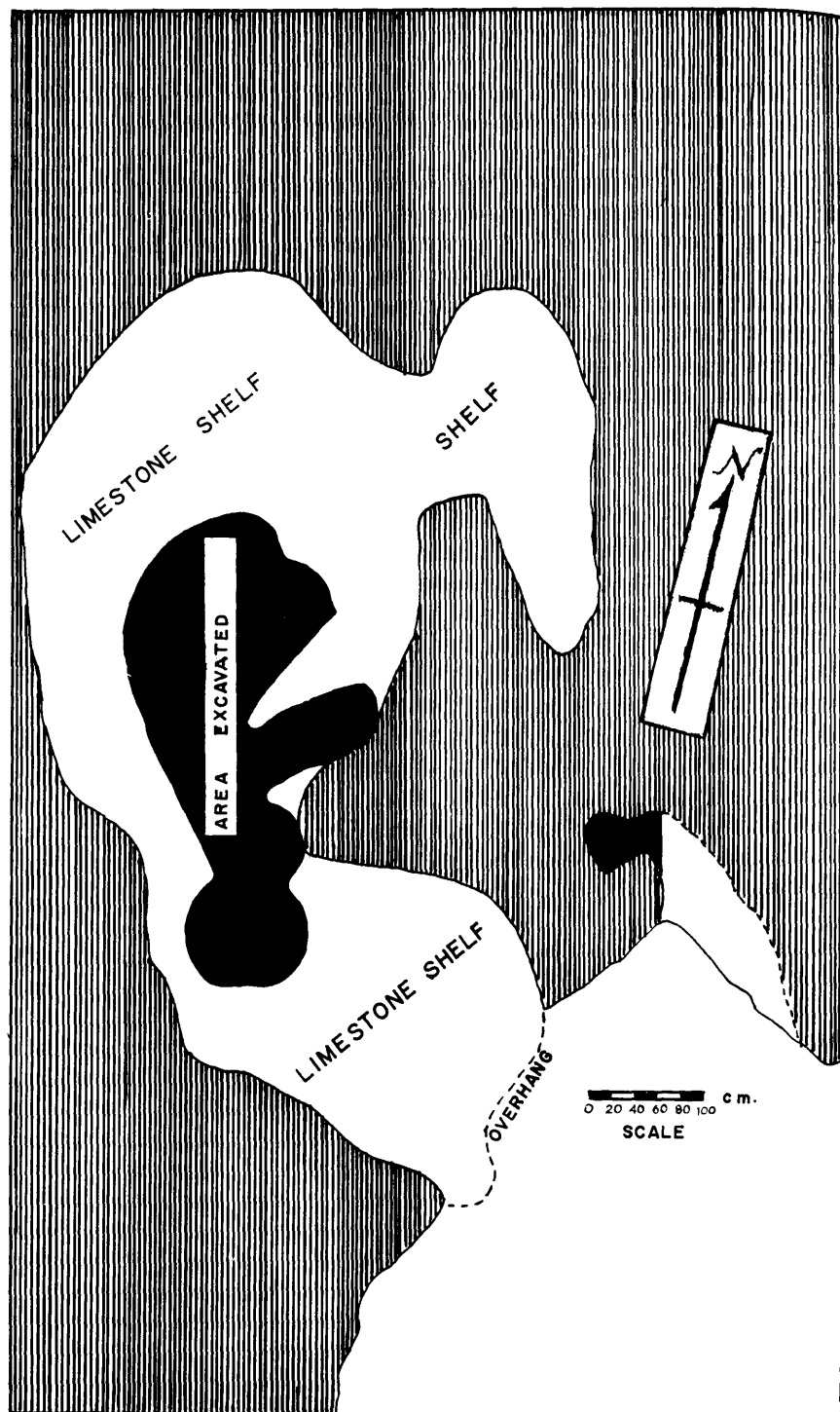


Fig. 30. Floor Plan of Ngipe't Duldug Cave, a Late Neolithic Jar Burial Site.

pottery vessels as well as an assemblage of stone tools, shell bracelets, and stone and shell beads (Table VIII) which are similar to those of Ngipe't Duldug Cave. The excavations of Leta Leta Cave provide relevant data as to the probable characteristics of the earliest pottery of the Tabon Pottery Complex. These data will be discussed again below with a summary treatment of jar burial in Palawan.

Found with the pottery was one stepped adze, a type which Beyer (1948a; 82) recognized as Late Neolithic; one scoop made from the "Baler Shell" (*Melo diadema*) which are associated with sites in Palawan (and elsewhere) that range in date from the Late Neolithic to the Developed Metal Age; one bracelet, oval in cross-section, made from the top of a Cone shell, probably *Conus litteratus*; and beads of shell and stone including jade (Table VIII). No metals, glass, or carnelian beads were found in this cave. The shell and stone beads found in Ngipe't Duldug Cave are identical to the types of beads recovered in Leta Leta Cave at El Nido and are certainly representative of the beads of the Late Neolithic in Palawan (see Table VIII).

Table VIII

LATE NEOLITHIC BEAD TYPES FROM NGIPE'T DULDUG CAVE, QUEZON, AND LETA LETA CAVE, EL NIDO, PALAWAN

DESCRIPTION	NUMBER	
	Ngipe't Duldug	Leta Leta*
<b>SHELL:</b>		
<i>Cypraea annulus</i> and <i>C. moneta</i> with dorsal surface removed (Color Plate I-A:1);	11	12
<i>Nassarius</i> spp., with dorsal surface removed (Color Plate I-A:s);	27	2,425
Small, thin, flat shell disks (Color Plate I-A:t);	210	3,041
<b>STONE</b>		
Green shale (?); round, flat, and relatively thin (Color Plate I-A:i);	9	29
Jade	4	1
Totals	261	5,508

\* This enumeration includes 94% of the stone and shell beads from Leta Leta Cave but not all types; and all of the beads from Ngipe't Duldug Cave.

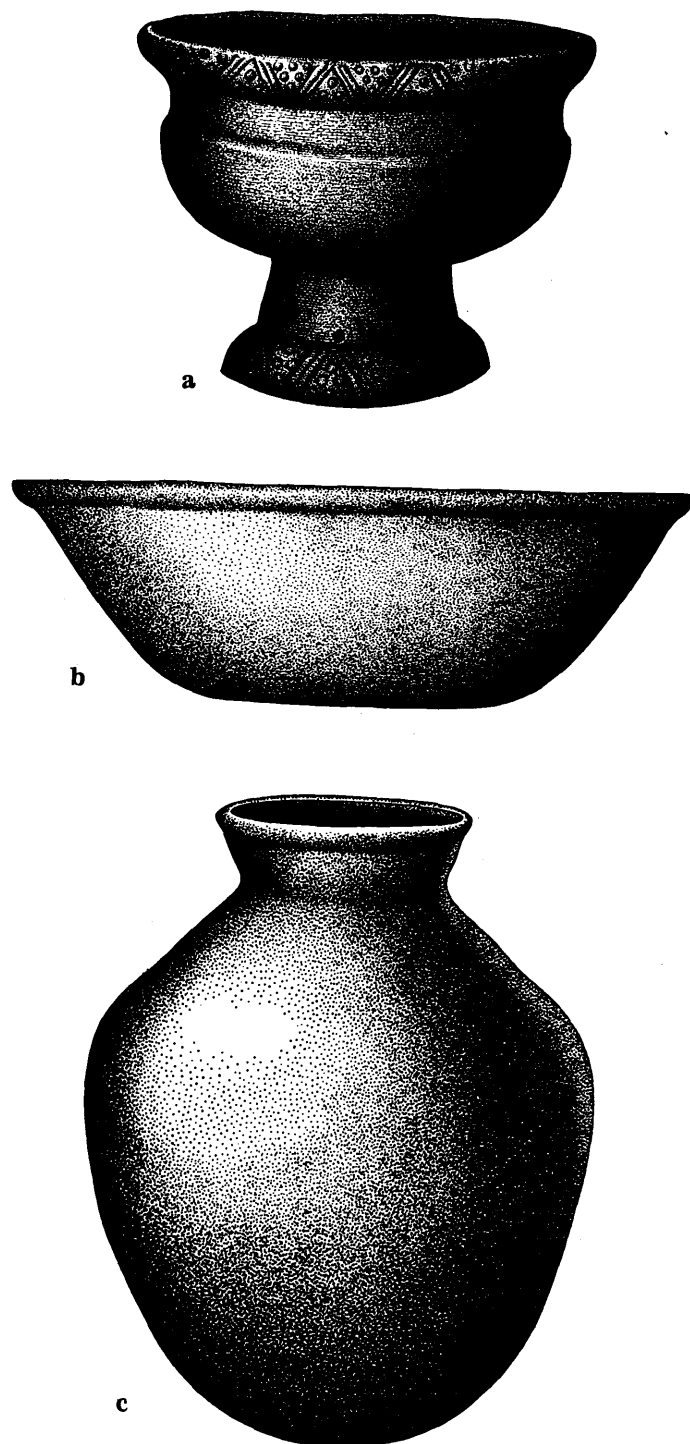


Fig. 31. Restored Vessels from Ngipe't Duldug Cave.

Analyses of the badly fragmentary and scattered skeletal remains show the presence of two juveniles and two or possibly three adults. The teeth were heavily stained probably from betel chewing. Painting with hematite is present which indicates secondary burial.

#### MANUNGGUL CAVE

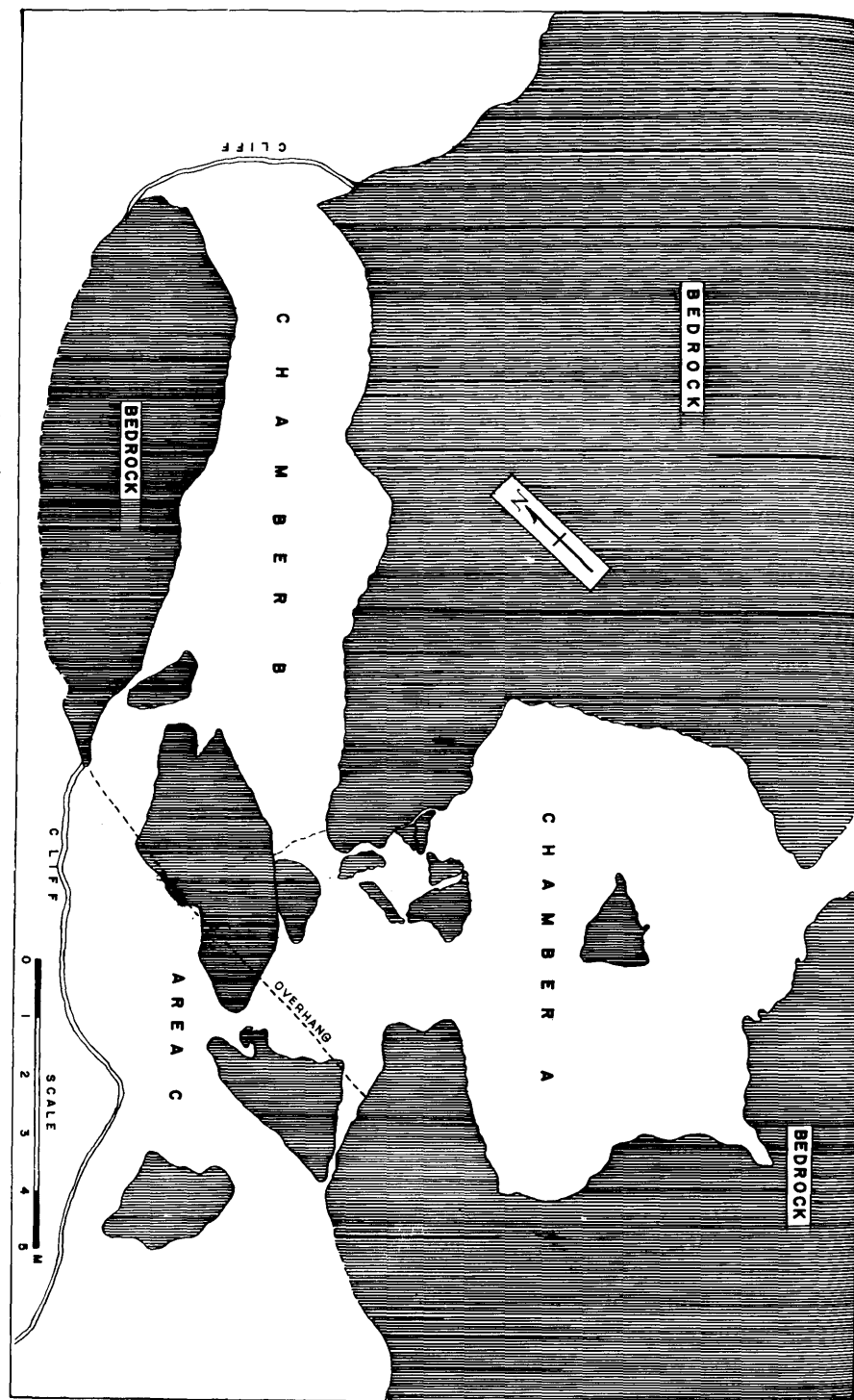
The setting of this burial cave is spectacular, being tucked into the face of a sheer cliff overlooking the South China Sea on the western side of Lipuun Point. Manunggul Cave is 375 feet high and to the south of Tabon Cave, and was not discovered until nearly two years after the excavations were begun in nearby Tabon Cave. The cave can only be reached from the side by passing through a gap in the cliff under an overhanging limestone bridge and then by climbing a sheer cliff. It was necessary to construct a perpendicular ladder, ten meters in length, in order to work in the cave. The view from the mouth of Chamber A of the South China Sea and nearby islands is truly magnificent. Certainly this cave was selected as a burial site, as were others, because it formed a majestic setting for the dead, and in spite of the difficulties which would have been encountered in placing the many large jars in the cave.

The discovery of Manunggul Cave by Mr. Victor Decalan, Mr. Hans Kasten, and volunteer workers from the United States Peace Corps in March, 1964, led to a re-exploration of all of the high cliffs of Lipuun Point. Before the discovery of Manunggul Cave it was not believed that such inaccessible caves could have been used for jar burial. Subsequent explorations, still not completed, led to the discovery of Pagayona Cave and three other very high caves.

The cave is composed of four chambers with three openings, but only two were used for jar burial. Chamber A, seven meters wide and nine meters in length, has a large round mouth. It is light and dry throughout. Chamber B is tunnel-like having a second opening on the northeast side of the cliff. This sloping chamber averages about two and one-half meters in width and is ten meters in length (see Fig. 32).

The first view of Chamber A was as dramatic as its setting; numerous large jars and covers, smaller vessels, skulls and portions of painted human bones scattered over the surface of the cave (Plt. X). Many of the vessels were either perfect, in nearly perfect condition, or had merely collapsed in their original positions. Striking too was the large number of decorated and painted vessels.

Fig. 32. Floor plan of Manunggul Cave: Chamber A is Late Neolithic and Chamber B and Area C are associated with iron implements.



The pottery in Chamber B, in contrast, was badly broken and scattered on the sloping floor, and the sherds were neither decorated nor painted.

Excellent charcoal samples, apparently from ritual fires, were obtained during the earliest phase of the excavations of Chambers A and B which were forwarded immediately for radiocarbon analysis. The field estimates of the relative age of the assemblages from the two chambers which were sent with the C-14 sample were later revised, however, for it was originally thought that the plain pottery in Chamber B was the earliest. The final C-14 determinations show, on the contrary, that the assemblage of Chamber A was the earliest. The C-14 dates as published [Berger and Libby (1966) 479] for Manunggul Cave, Chambers A and B, are thus reversed. The completed excavations of these two chambers also revealed highly distinct assemblages (see Table IX)—Chamber A being late Neolithic and Chamber B, Developed Metal Age with iron.

Table IX

COMPARISON OF TYPES OF ARTIFACTS FROM  
CHAMBER A AND CHAMBER B OF MANUNGGUL CAVE

Types of Artifacts	Chamber A Late Neolithic (710-890 B.C.)	Chamber B Developed Metal Age (190 B.C.)
Iron Fragments	0	30
Glass Beads	0	13
Glass Bracelets	0	3
Jade Beads	83	50 (?)
Carnelian Beads	0	21
Misc. Stone Beads	48	19
Shell Beads	(17)*	(17)*
Jade Bracelets	4	1
Agate Bracelets	3	0
Shell Braclets	2	0

\* Beads from the two chambers of this cave were accidentally mixed during analysis.

The C-14 date from Chamber B, Manunggul Cave, is the first absolute date for the presence of iron in the Philippines and agrees with Beyer's (1947: 208) estimate for the beginning of the "Iron Age" in the Philippines; "...about 250-200 B.C." It must be stressed, however, that the island of Palawan was probably one of the first areas to be reached by iron (if not the first) and although iron and its manufacture unquestionably diffused with great rapidity, there were undoubtedly many coastal and lowland areas of the Philippines which continued to use stone tools until well into the Christian era. One of the Bato Caves in Sorsogon Province, southern Luzon, yielding a Late Neolithic assemblage of primary burial jars, polished tools, blades of chert, and stone and shell beads had a C-14 determination of 179 A.D. (Fox and Evangelista 1957a). Too, although "drift" iron implement, may have diffused rapidly, the actual production of iron in the Philippines probably occurred at a much later date. The two radiocarbon dates for Chamber A of Manunggul Cave, 710-890 B.C., are also consistent with the C-14 date from Batungan Cave, Number 8, Masbate, of 754+ 100 B.C. for a Late Neolithic assemblage of stone tools and pottery [Solheim (1959a) 162 and 165].

*Chamber A.*—Seventy-eight jars, jar covers, and smaller earthenware vessels were found on the surface and in the subsurface levels of this chamber. The range of forms and designs is remarkable and to the writer, at least, presents a clear example of a *funerary pottery*; that is, vessels which for the most part were potted specifically for burial and ritual purposes. Eight of the nine pottery types tentatively established for the Tabon Pottery Complex were recovered in this Chamber; *Tabon Organic Glazed* was not found. In contrast, only three pottery types were definitely established for Chamber B: *Tabon Plain*, *Tabon Polished*, and *Tabon Impressed* (see Table VII). As the pottery from Chamber A will be describe in a detailed site report now in preparation, only brief remarks will be made at this time about the outstanding pieces (see Frontispiece and Fig. 33).

The burial jar with a cover featuring a ship-of-the-dead (Color Frontispiece and Fig. 34) is perhaps unrivalled in Southeast Asia; the work of an artist and master potter. This vessel provides a clear example of a cultural link between the archaeological past and the ethnographic present. The boatman (Fig. 34) is steering rather than paddling the "ship." The mast of the boat was not recovered. Both figures appear to be wearing a band tied over

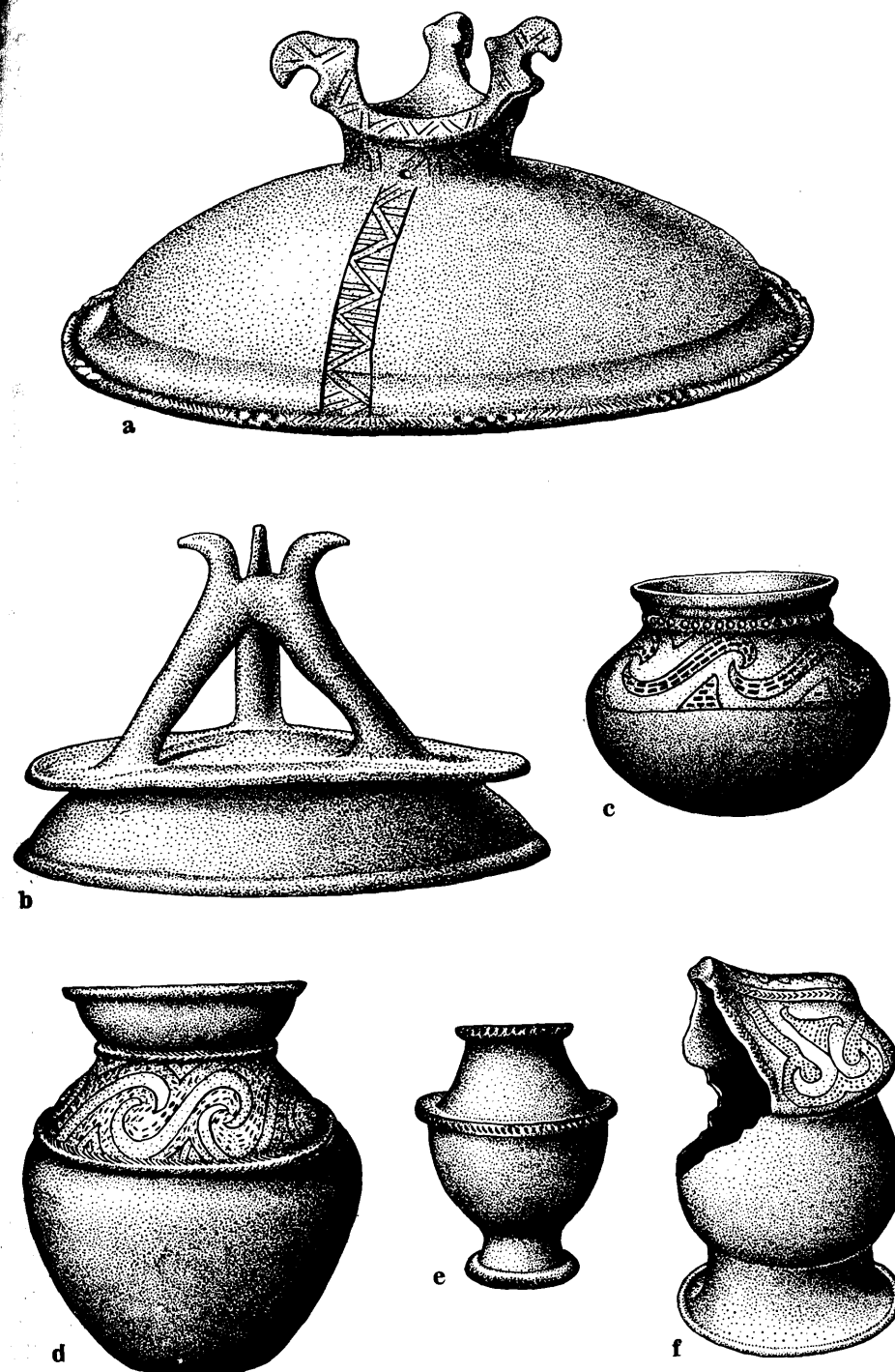


Fig. 33. Funerary Vessels from Chamber A, Manunggul Cave.

the crown of the head and under the jaw; a pattern still encountered in burial practices among the indigenous peoples in the southern Philippines. The manner in which the hands of the front figure are folded across the chest is also a widespread practice in the Islands when arranging the corpse.

The carved prow and eye motif of the spirit boat is still found on the traditional watercraft of the Sulu Archipelago, Borneo, and Malaysia. Similarities in the execution of the ears, eyes, nose, and mouth of the figures may be seen today in the wood-carving of Taiwan, the Philippines, and elsewhere in South-east Asia (Chen 1962).



Fig. 34. Details of the spirit boat on the jar cover from Manunggul Cave.

Among the Tagbanwa of Palawan, the souls of people who have died from epidemic sickness are believed to be carried to a sky world in a similar ship-of-the-dead. Informants speak of seeing these boats in their dreams filled with the departing souls of their loved ones [Fox (1954) 217]. During rice wine rituals a wooden turtle is floated in the mouth of wine jars to provide a vehicle for the "sailors," a class of deities that combat the evil deities of epidemic sickness. On Pawikan Ledge, below Tabon Cave, a small turtle carved from old ivory (?) was excavated (Fig. 35). This artifact may well have had a similar ritual meaning although not used. This jar and figurine cover is closely linked with a cult-of-the-dead; a cult, as noted, which is still a principal element of religious beliefs and practices among the minority peoples of Palawan and throughout the Philippines.

Two other jar covers from Chamber A are noteworthy: one has three animal or bird heads surrounding an opening; the other, a unique tripod construction (Fig. 33). Smaller vessels containing ritual offerings could have been supported by the tripod arrangements on these covers. There are fewer covers than jars in Manunggul Cave suggesting, as noted, that wooden covers may have been used. All

outer surfaces of one large jar and its cover, as well as other vessels, had been painted with hematite. These were painted after firing and possibly painted in the cave.

Another unusual ritual vessel from Manunggul Cave is a red slipped bowl with a foot-ring and roof-like construction which was intricately incised and painted. The stirrup design featured on the "roof" of this vessel (Fig. 33f) is unique. One pottery coffin for secondary burial, 73 cm. in length and 34 cm. in width, was excavated. This coffin has a mat impression on the base. This is the first coffin made of pottery, insofar as the writer knows, found in the Philippines, although highly decorated pottery and wooden skull-boxes have been recovered [Solheim (1959a) 164 and Plt. 5 (b); Evangelista

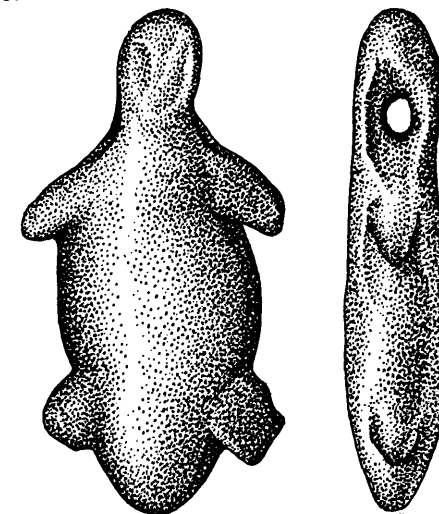


Fig. 35. Carved turtle from Pawikan Shelf; the medium is possible old ivory.

(1963) 53]. In the Philippines, wooden coffins are of Metal Age or proto-historic in date; but at Niah, Harrison recovered a tree trunk coffin with a C-14 determination of  $2,460 \pm 70$  years ago which is well into the Neolithic [Solheim, Harrison, and Wall (1961) 238]. It is highly likely that wooden coffins of the Late Neolithic will also be found in Palawan, for the pottery coffin from Manunggul Cave has the form of a tree trunk.

Curvilinear scrolls designs on the upper body of the vessels, including large jars, from Chamber A, Manunggul Cave are common (Figs 23 and 33-c and 33-d); either (a) patterns formed by incised lines or incised and impressed design elements made within the lines, (b) incising and painting, or (c) incised patterns made with a multiple pointed comb-like instrument (Figs. 23 and 33). These designs show close affinity with the Kalanay and Sa-huynh Pottery Complexes.

The beads associated with the pottery in Chamber A include a few shell beads of two types, principally the thin, flat shell disks which occur in other Neolithic sites (Colored Plate I-A:t); possibly barrel shaped beads of a black-and-white banded onyx (Colored Plate I-A:

a); and 83 jade beads of three basic types. The three types of jade beads recovered were (1) roughly polyhedral in cross section, long or short; (2) roughly rectangular in cross section, long or short (Color Plate I-A:e), and (3) disk shaped, fairly thin, with rounded edges (Color Plate I-A:c). Beyer (1948a; 63-64) records similar types of jade beads from the Late Neolithic of Batangas.

Although it is recognized that beads of stone, shell, and glass are almost useless for dating purposes, surviving for hundreds of years after their initial appearances—e.g., the Ifugao, Kalinga, and other groups in Northern Luzon still wear and prize stone beads which date largely from the Metal Age or later—a comparative study of the types of beads from the Tabon Caves for which there are reliable absolute or relative dates shows that great differences exist between the beads of the Late Neolithic and those of the Metal Age, as well as differences between the beads of the early phase of the Metal Age and those of the later Developed Metal Age when iron was present.

Stimulated by these initial comparisons, a thorough chronological study, including method-of-manufacture, of the Palawan bead types is being completed by the writer, Messrs. Ruperto Santiago and Manuel Santiago of the National Museum, and others. This report will be published in the near future with descriptions (chemical analyses of glass) and color illustrations of all bead types. Only two observations for comparative purposes on the jade beads from Manunggul Cave are included at this time: (1) they were generally drilled from both ends in long sections of jade which could form two or more beads, and then (2) "broken" into individual beads. This was done by drilling one or two tiny holes at right-angles to the axis of the beads (Color Plate: I-A:e). The ends of the beads were then smoothed leaving only faint grooves made by the drilling. The ability of the stone-age people to work and drill extremely small holes in the jade beads is phenomenal, for jade is a hard stone which cannot be scratched with an ordinary metal knife. An analysis made under the direction of Mr. Cecilio R. Sison, Chief, Metallurgical and Laboratory Services Division, Bureau of Mines, of ten fragments of beads, bracelets, and earrings from the Tabon Caves of the rock described herein as "jade" shows that it is specifically *nephrite*, one of the types of "true jade" [Zim and Shaffer (1957) 88].

Fragments of eight distinct bracelets were also found in Chamber A of Manunggul Cave: four of jade, three of an agate, and two made from large Limpet shells. One perfect jasper ear-pendant

was recovered, and a superb thin and translucent, ellipsoid-shaped pendant of a red colored chalcedony (?). No metals—bronze, copper, iron—glass beads or bracelets, or other artifacts characteristic of the Metal Age were found in Chamber A of Manunggul Cave; and the two C-14 dates for this assemblage of 710 B.C. (UCLA-992B) and 890 B.C. (UCLA-992A) fall into the Late Neolithic of Palawan and the Philippines.

*Chamber B.*—This chamber yielded a Developed Metal Age assemblage of artifacts (see Table [X]) and a C-14 determination consistent with past estimations for the date of the first appearance of iron in the Philippines—190 B.C. The open ledge in front of Manunggul Cave, designated as Area C (Fig. 32), as well as Chamber B, was also used by the people having iron.

The pottery of Chamber B (and Area C) is distinct from the highly decorated funerary pottery of Chamber A, notably in the limited range of pottery types. The pottery of Chamber B, however, still displays the basic and diagnostic features of the Tabon Pottery Complex — method-of-manufacture, sand tempering, surface colors, forms of burial jars, trunconical jar covers, smaller vessels with notches on the rims made with a simple tool, angle-bodied wares, slipping, and so forth. Three pottery types are certain: *Tabon Plain*, *Tabon Polished*, and *Tabon Impressed*.

The *Tabon Impressed*, however, consists solely of vessels with designs impressed on the rims or on flanges at the throats of the jars. There is no cord marking or carved paddle impressions on the bodies of vessels. The absence of paddle decorations on the pottery of Chamber B, Manunggul Cave, is highly significant, for it is also absent or rare in the late phases of other Developed Metal Age cave sites in Palawan. In short, paddle decorated in Palawan is characteristically Late Neolithic and Early Metal Age; not Developed Metal Age. It is likely that this temporal trend—the fading out of paddle decoration during the Developed Metal Age—continued into the central and northern Philippines, explaining its rarity or absence in these latter areas.

One sherd of *Tabon Incised* was found in Chamber B, but it is likely that it came from Chamber A. One, possibly, two, vessels had perforations forming designs on the ring feet (a study of the perforations show that they had been made with a round instrument after the pottery had been thoroughly dried). Another simple bowl had perforations below the rim and one trunconical cover had perforations at the corner point of the in-turning rim. Perforations

forming design patterns on ring feet are rare in the Tabon Pottery Complex.

The artifacts associated with Chamber B and Area C are typical of Metal Age sites throughout the Philippines which are associated with iron. Iron fragments were common (Table IX) and included one piece with a mat impression in the rust-oxidized crust. Four types of glass beads were found during screening: (1) round, red-brown, opaque glass beads which are found everywhere in the Islands in sites with iron (Color Plate I-B:t); (2) small, round, light-blue glass beads (Color Plate I-B:g); (3) round, slightly opaque, and larger green glass beads (Color Plate I-B:r); and (4) round, small, translucent, and dark ultramarine glass beads (Color Plate I-B:h). Jade beads, a long and short cylindrical form, were common; as well as, barrel-shaped carnelian beads (see the discussion below of carnelian beads under the description of Duyong and Uyaw Caves). Two sizes of barrel-shaped onyx beads were also recovered (these could have come from Chamber A), and the Neolithic type of green, disk-shaped shale (?) beads. Three types of shell beads were sifted: (1) large ring-like beads which were also found in Batu Puti Cave (Color Plate I-A:u), (2) tiny disk beads which first appear during the Neolithic in great numbers, and (3) the typical small Cowry beads (*Cypraea annulus*) with the dorsal surface removed.

Five faceted black-and-white stone beads which were found are possibly unique to Island Southeast Asia, according to Dr. Alstair Lamb, but are known from the Mainland of South Asia. The white bands bordering the facets were made by etching with acid (see Color Plate I-A:j). Fragments of three clear, green glass bracelets, triangular in cross section, were excavated in Area C. These are encountered in Metal Age and proto-Historic sites throughout the Archipelago.

Shell spoons made from the Chambered Nautilus (Fig. 42) were found in Chamber B and in Batu Puti Cave. The striking similarities of the glass and shell beads, glass bracelets, the shell spoons, as well as pottery between Chamber B of Manunggul Cave and one assemblage of artifacts from Batu Puti Cave clearly indicate that these two sites were used for jar burial at approximately the same time. Spoons made from the Chambered Nautilus, however, have a long history in the Philippines. They first appeared in the Late Neolithic, possibly earlier, and are still being made and used by indigenous peoples in the Philippines. In 1948, the writer collected a number of these spoons among the Agta ("Negritos") of Polillo Island, Luzon, and they are made even by the Ifugao.

Other recoveries in Chamber B included two round pebbles which were undoubtedly used as polishing tools in pottery-making, for each has a brilliant sheen on both sides; as well as two ellipsoid-shaped pebble hammers showing marked abrasion on the ends.

Thus, although there is continuity in the types of artifacts from Chamber A and Chamber B of Manunggul Cave, notably in the pottery and beads, the basic technology and the total assemblage of artifacts from each cave are highly distinct; that of Chamber A being Late Stone Age with two C-14 dates of 890 B.C. and 710 B.C., and Chamber B, Metal Age, with a C-14 determination of 190 B.C.

#### DUYONG CAVE AND UYAW CAVE

The surface and sub-surface levels of Duyong Cave at Iwaig (see above) and Uyaw Cave on Lipuun Point yielded an almost identical assemblage of artifacts and date from the same period—a cultural sequence following the Neolithic which is described herein as the Early Metal Age, circa 500 B.C. (?) to 200 B.C. The physical features of Duyong Cave were discussed above.

Uyaw Cave is located on the north side of Lipuun Point, along the steep trail between Guri Cave and Pagayona Cave (Fig. 5). The one small chamber is almost square measuring about 5½ meters at its greatest width and length (Fig. 36). The surface of the cave is flat and the opening large. The cave is light and dry throughout. When discovered, the floor of the cave was covered with disturbed sherds of jars and smaller earthenware vessels, indicating that it had been frequently used as a nesting place by porcupines and probably wild pigs.

The major portion of Uyaw Cave was excavated in March, 1965. The excavations did not reveal any stratigraphy although a few pieces of chert and some flake tools were found on the surface and in the sub-surface level mixed with the jar burial assemblage. There was no midden area within the cave and, in fact, little accumulation of deposits since the cave was first used. It is probable that more or less the present disturbed floor was frequented by the flake tool people of nearby Guri Cave and then used again, thousands of years later, for jar burial.

Both Duyong Cave and Uyaw Cave yielded a remarkable wealth of identical jade ornaments — the "lingling-o" type of ear-pendant [Beyer (1948a) 68-69]; bracelets; beads; and stud-like objects, either saddle or cone shaped, which were probably set in wooden orna-



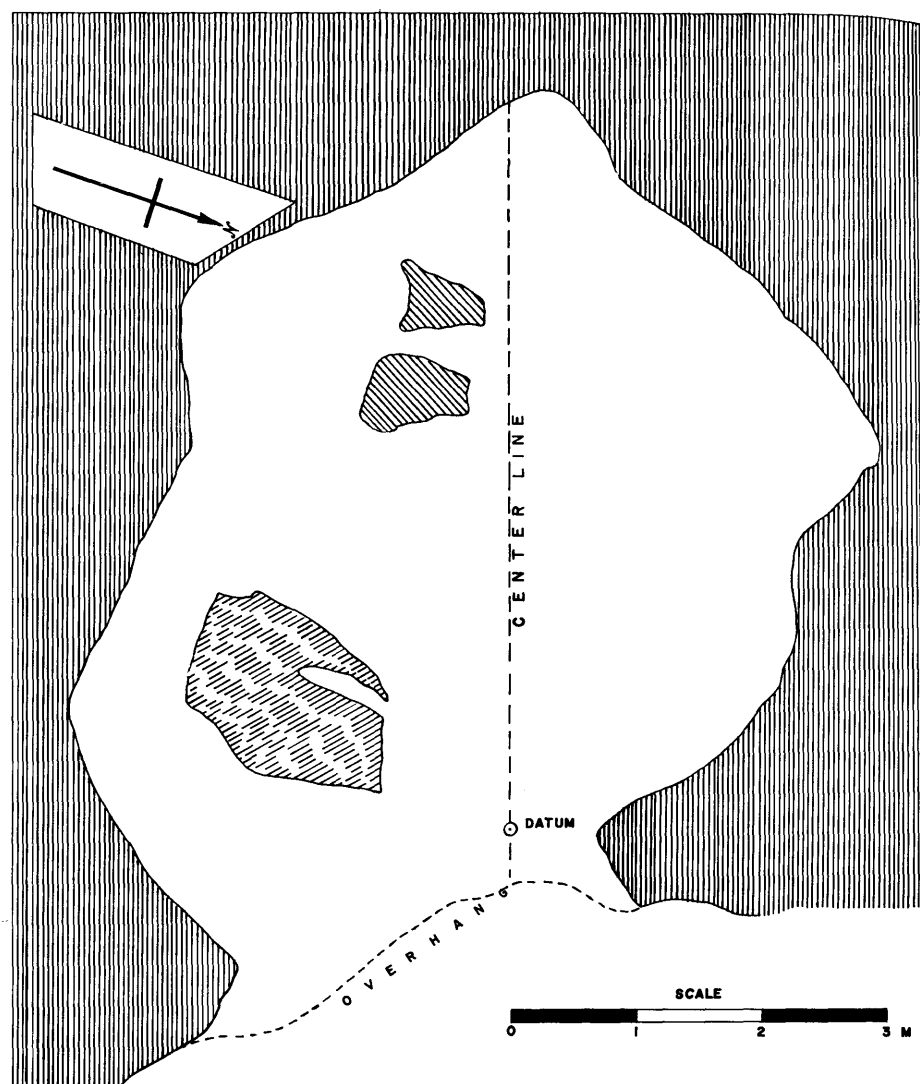


Fig.36. Floor Plan of Uyaw Cave.

ments such as ear plugs. These beautifully carved ornaments (Fig. 37) of an extremely hard, green nephrite form a key trait, as will be seen, of the Early Metal Age. Small, polished stone tools and bronze were found in both cave and iron (?) in Duyong Cave.

All of the pottery types of the Tabon Pottery Complex, except *Tabon Painted*, were represented in Duyong Cave (Table VII and Figs. 21 and 22). Fewer pottery types were found in Uyaw Cave, undoubtedly reflecting the relatively few vessels placed in the cave, but the pottery of this cave is also intimately related to the Tabon Pottery Complex.

*The Early Metals and Problems Concerning the Definition of this Cultural Sequence.*—The excavations in Duyong and Uyaw Caves, as well as others, have yielded a unique assemblage of cultural materials which include the early metals—bronze, copper, gold—in limited quantities in association with many ornaments of jade and distinctive jade ear-pendants, ancient glass beads, and a developed pottery complex associated with jar burial. This cultural assemblage may also be found with either small Late Neolithic stone adzes or with iron implements and sometimes both.

The writer (Fox 1967) toyed with the use of the term "Chalcolithic" to describe this period, for it was *brief* and *transitional*. But, it would not appear logical to introduce a special terms for a transitory period of prehistory, at least in the Philippines, when the basic change was from the use of stone tools to metal tools, particularly to the use of iron and eventually the knowledge of iron making [see Child (1953) 195ff]. The jar burial caves of this period all contained metals and even though there might have been a brief period when bronze and copper predated iron (see below), the sites having a metal assemblage are by definition "Metal Age" or some such terminology which distinguishes the Stone Age from the following cultural sequence when metals were used. The term "Chalcolithic" is thus unnecessary.

Likewise, as the writer has pointed out elsewhere [Fox (1959a) 21], the archaeological evidences from the Philippines and now Palawan do not justify the recognition of a "Bronze Age" or a "Copper-Bronze Age" in the Islands. The usage of these descriptions by Beyer, even though he notes that the "Bronze Age" was limited and probably only a phase of the Late Neolithic having relationships with the Yangshao of China [Beyer (1948a) 91-96], has been uncritically elaborated upon by many historians (e.g., Zaide, 1949). Without archaeological evidences, a "Bronze Age" has been improperly



established as one of the major periods of Philippine culture history (see Tangco 1951).

The brief period when bronze and copper first appeared (and "drift" iron may have appeared together with these metals) did not represent a major phase of technological development in the Philippines, although the period was accompanied by new and extensive movements of people into Palawan and the Philippines. Objects of prehistoric bronze and copper are extremely rare in Philippine sites. As Beyer (1948a: 54) noted, his extensive survey of southwestern Luzon yielded only "...four whole celts, five fragments of celt, two fragments of spearheads, and several ornamental objects..." The excavations in Palawan have greatly increased this inventory but even in the Tabon Caves bronze and copper objects are limited in numbers.

Tin, moreover, which is a basic constituent of bronze, has not been mined in the Philippines. Bronze (or copper) adzes were cast in Palawan by the jar burial people as shown by the recovery of fire clay moulds, but the bronze used was probably obtained from either imported metals or from old tools which were reworked. There is no justification, based upon present archaeological data, of speaking of a prehistoric bronze industry in the Islands; although copper and gold were recovered and worked by the mountain peoples of northern Luzon possibly, it would appear, in pre-Spanish times.

Finally, the early appearance and rapid diffusion of iron and iron-making precluded the development in the Philippines of a true "Bronze Age." For Borneo, Harrison (1959: 7) has expressed a similar view: "...the rapid advance of iron helped shorten and submerge the 'bronze age' which even Niah has not been able to show as a major technological phase in Borneo."

Professor Beyer, apparently confused by the uncertainty of the association of artifacts from surface collections, variously ascribed the appearance of the early metals to a phase of the Late Neolithic, as noted, or to a "Bronze Age" [Beyer (1948a) 54-56 and 91-96]. The artifacts which Beyer (1948a: 65) associated with the "...third and fourth phases of the Late Neolithic horizon..." in Batangas Province were socketed bronze adzes and spears, beads of ancient glass, and ornaments of a developed "jade cult," including the unique "lingling-o" type of jade ear-pendant (see Fig. 37). In contrast, not a single bronze object, glass bead, or the unique ear-pendants of jade has been found in Palawan in a Late Neolithic site (see Tables VII and X), and in fact these artifacts form a diagnostic

assemblage of the Early Metal Age. The jade (nephrite) ornaments associated with the Late Neolithic sites in Palawan are confined wholly to beads and bracelets. A few small, quadrangular nephrite adzes have also been excavated in the jar burial sites in Palawan in both Late Neolithic and Early Metal Age sites.

Rito-Fabian Cave has recently produced striking varieties of the "lingling-o" ear-pendants made of jade, shell, and a beautiful green glass (Fig. 41). The site is relatively early Developed Metal Age in date and significantly includes iron. Beyer (1948a: 69) writes that a copper-blue glass ear-pendant of this type was found in an "Early Iron Age" site in Rizal Province. The assemblage of the Early Metal Age—bronze, copper, ancient glass and the distinct jade ornaments—persisted into the Developed Metal Age when iron was present, but these artifacts do not occur in the Late Neolithic sites of Palawan and it is questionable, regardless of Beyer's statements, that they ever occurred in the Late Neolithic of Batangas.

The excavations in the Tabon Caves have still not demonstrated with certainty when the Metal Age in Palawan began. Manunggul Cave, Chamber B, has provided a finite C-14 date for the appearance of iron in Palawan—190 B.C. The same cave but in Chamber A yielded C-14 dates for a Late Neolithic assemblage of 890 B.C. to 710 B.C. This would provide a maximum time-span for the period of the Early Metal Age of from about 700 B.C. to 200 B.C. These dates agree closely with Beyer's estimate "...for the Batangas bronzes as coming between 1000 and 500 B.C. (and most probably near to 800 B.C.)," and of the "lingling-o" type of jade ear-pendants as dating "...sometime between about 500 B.C. and the beginning of the Christian Era" [Beyer (1948a) 55 and 69]. The sites in Indo-China and South China which contain a similar assemblage of early metals and iron, ancient glass, and the same jade ear-pendants are also dated as falling between 400 B.C. and 100 B.C.

The C-14 determination for Chamber B of Manunggul Cave appears to represent one of the earliest appearances of iron, for its usage was certainly not widespread in the Philippines much before 190 B.C., and probably later. It is likely, moreover, that the Late Neolithic in Palawan persisted to after 700 B.C., shortening the length of the period of the Early Metal Age. Elsewhere in the Philippines the Late Neolithic persisted into the Christian Era, as noted, followed directly by the appearance of iron, the early metals of bronze and copper having little impact upon many of the peoples in the Islands (Fox and Evangelista 1957a and 1957b). It is the writer's opinion that further excavations in Palawan will con-

tinue to reduce the duration of the period of the Early Metal Age; at least to shorten the period which had the distinct assemblage of bronze tools and weapons, ornaments of jade, and ancient glass, although stray bronze objects may have appeared at an earlier date. It is even possible, as suggested by comparative data from Indo-China, that rare iron implements—"drift-iron" but not the knowledge of iron-making—accompanied the first appearance in the Philippines of bronze and copper. Iron is found in the key Indo-China sites such as Sa-huỳnh which show close relationships with the Palawan jar burial sites.

In Northern Luzon, copper was extracted locally and made into tools, weapons, and ornaments up until recent times. Professor Beyer (1948a: 55) believed that this copper industry is ancient and was associated with the introduction of terrace building some 2,000 years ago. But in the complete absence of an archaeological record from northern Luzon, it is not even known when in relationship to the appearance of iron that the local production of copper began. Much speculation and few data still characterize the larger archaeological record of the Philippines.

An attempt has been made to establish a chronology for jar burial sites which fall into the period of the Early Metal Age, that is, from the first appearance of bronze and copper to the presence of iron in quantity. This preliminary cultural chronology is based upon a seriation analysis of the total assemblage of artifacts, excluding pottery, found in the type jar burial sites. Thus, Duyong Cave and Uyaw Cave have been assigned to the earliest phase of the Metal Age, for in both bronze was found with Late Neolithic quadrangular adzes, and numerous ornaments of jade. No glass objects were found in Duyong Cave and only six glass beads and two fragments of a glass bracelet in Uyaw Cave. Two of the bead types from Uyaw Cave have appeared only in this cave and are probably representative of the earliest glass to reach the Islands (Color Plate I-B:d and e).

A disturbed portion of Duyong Cave yielded iron, and one iron fragment was found in front of Uyaw Cave. These iron associations are open to doubt but still may be valid associations of an early "drift iron." Assemblages excavated in Tabon Cave and Guri Cave had bronze fragments and glass beads but no iron. Guri Cave had two gold beads suggesting that gold (trade ?) ornaments predated the appearance of iron in the Philippines. The jar burial assemblage of these four caves—Duyong, Uyaw, Tabon, Guri—have also been assigned to the first phase of the Early Metal Age.

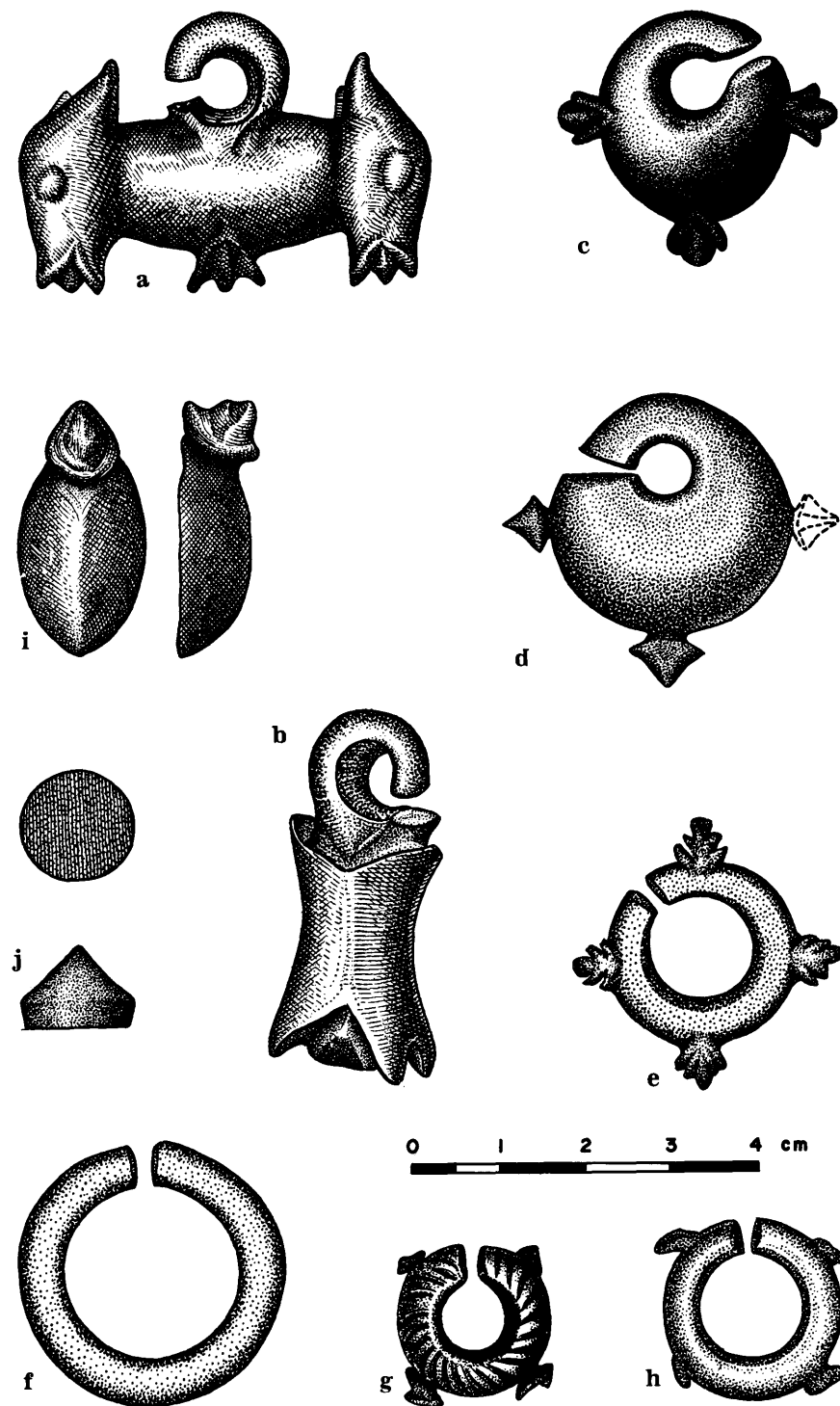


Fig. 37. Nephrite (Jade) Ornaments of the Early Metal Age.

Rito-Fabian cave had bronze and copper fragments, ear-pendants of jade, shell and glass, glass and carnelian beads, and a positive association of iron. This cave would appear to be an early representative of the Developed Metal Age with iron. It is noteworthy that beads of carnelian are typically Developed Iron Age, although they first appear in the Early Metal Age sites. Later burial caves, such as Pagayona and Tadyaw, are fully Developed Metal Age with iron, and the distinctive types of jade ear-pendants and other ornaments are no longer present. In addition, the glass and stone beads found in Pagayona Cave and Tadyaw Cave are of the types that are found throughout the Philippines in "Iron Age" sites.

These quantitative data on the associations of stone tools, bronze objects, iron implements, the distinctive jade ear-pendants and ornaments, glass beads and bracelets, and beads of carnelian and jade form the basis for this chronological arrangement of the jar burial caves summarized in Tables VI, X, and XII.

*Jade.*—The two small caves, Duyong and Uyaw, yielded an astonishing quantity and quality of green nephrite ornaments, in particular types of ear-pendants which heretofore have been rarely collected in Philippine sites and not outside of the central Philippines, particularly Luzon [Beyer (1948a) 68-69]. This type of ear-pendant (Fig. 35-c to h), described herein as "lingling-o" following Beyer, are related to ear-pendants made of metal and still worn by the Ifugao of northern Luzon. The "lingling-o" is the diagnostic ornament of the Early Metal Age in the Tabon Caves. Beads, earrings, bracelets, and stud-like objects were also made of jade.

Beyer (1948a) has clearly demonstrated that nephrite was known and worked in the Philippines during the Late Neolithic; he collected thousands of nephrite adzes-axes as surface recoveries during his surveys of Batangas, Rizal, and Laguna Provinces. A few "lingling-o" jade earrings were also recovered in Batangas during surveys that Beyer associates with the "third phase" of the Late Neolithic which also includes stray finds of a few bronze celts and spear points [Beyer (1948a) 94-95].

The archaeological data from the Tabon Caves are more precise as to the association of the "lingling-o" type of ear-pendants. Ngipe't Duldug, a Late Neolithic site, yielded no jade ornaments but jade beads; Manunggul Cave, also Stone Age, four fragments of jade bracelets and 83 jade beads. Leta Leta Cave, El Nido, which is believed to be a still earlier Late Neolithic site, had only one jade bead and one jade pendant made by drilling a hole in a fragment

Table X

CHRONOLOGY OF THE "LINGLING-O" TYPE OF JADE  
EAR-PENDANTS FROM THE TABON CAVES

<i>Caves and Chronology</i>	<i>"Lingling-o" Ear-Pendants</i>			<i>Socketed Bronze Adzes</i>
	<i>Jade</i>	<i>Other Stones</i>	<i>Shell</i>	
<i>Late Neolithic</i>				
Leta Leta (El Nido)	0	0	0	absent
Ngipe't Duldug	0	0	0	absent
Manunggul (Chamber A)	0	0	0	absent
<i>Early Metal Age</i>				
Duyong	18	1	6	pottery mould for making bronze adzes present
Uyaw	14	0	6	present
Tabon (jar burial assemblage)	0	2	0	absent (excavations not completed)
Guri (jar burial assemblage)	6	0	2	absent
Batu Puti	0	0	1	pottery mould for making bronze adzes present
<i>Developed Metal Age</i>				
Pagayona	0	0	0	absent
Tadyaw	0	0	0	absent

<sup>6</sup> Batu Puti Cave contained cultural sequences extending from the late phase of the Early Neolithic to the Metal Age in shallow and generally badly disturbed deposits. The areas and levels of the different assemblages could not be distinguished with certainty except for one interior grotto.

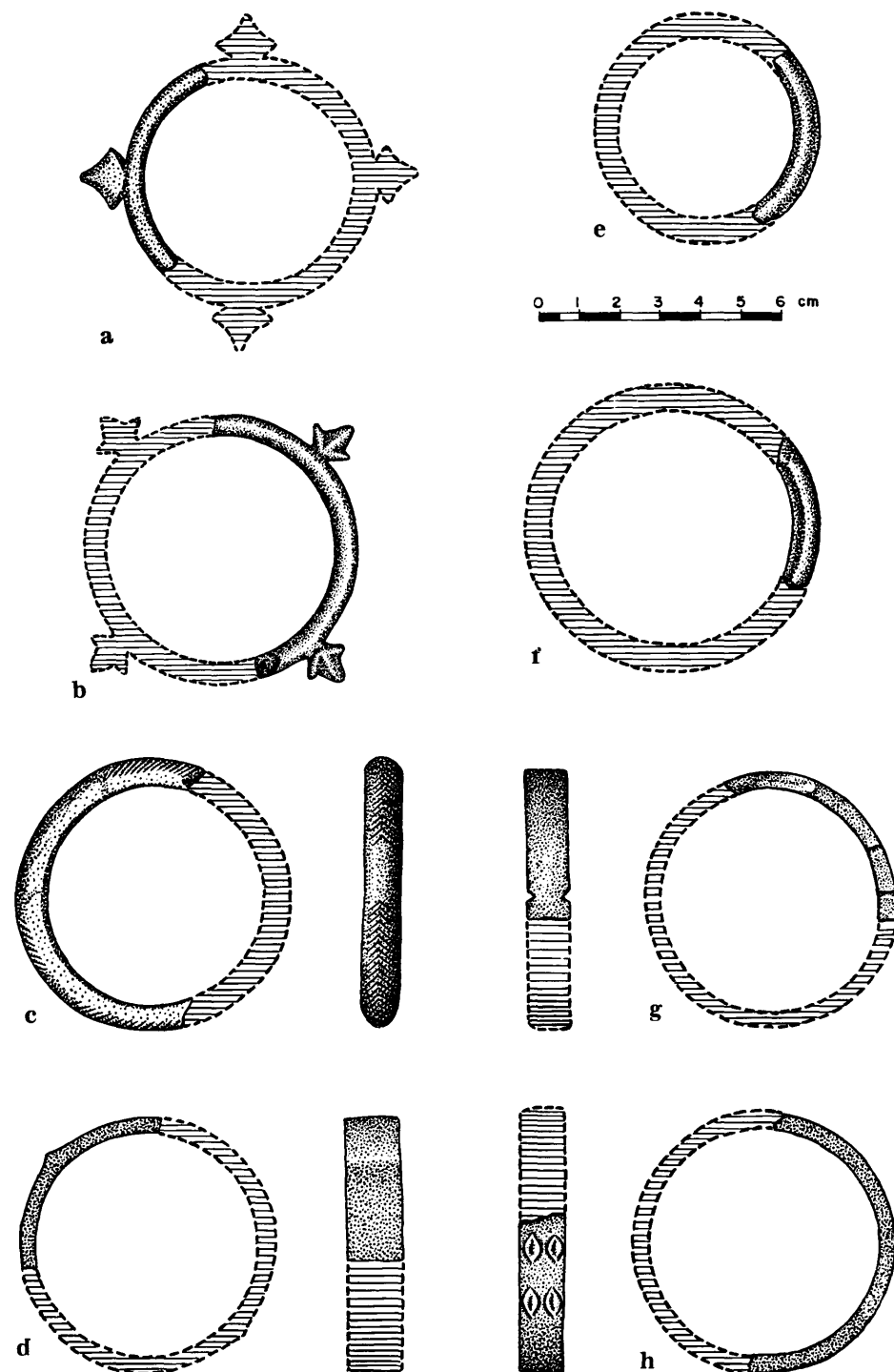


Fig. 38. Nephrite (Jade) bracelets from the Tabon Caves.

of a broken jade bracelet. Thus, as shown in Table X, the diagnostic “lingling-o” ear-pendants are not found in Late Neolithic sites but in sites with bronze objects, including socketed bronze adzes, and ancient glass of the Early Metal Age.

Two types of the “lingling-o” ear pendants excavated in the Tabon Caves are common. One type (Fig. 37-a and d), the usual form found in Palawan, was recovered in Duyong and Uyaw Cave as well as other caves on Lipuun Point (Table XI) and is identical to a type found in Indo-China at Sa-huỳnh [Malleret (1959) Plt. VII-e; Beyer (1948a) Fig. 27-1]. These—the “Sa-huỳnh type”—were also recovered in the Tabon Caves made of shell and hard stones other than jade.

The other type (Fig. 37-e-g-h) of “lingling-o” ear-pendant, found to date only in Uyaw and Guri Cave, is similar to a type found in Hongkong [Finn (1958 Plt. 46-H; Beyer (1948a) Fig. 27-4], although these may also be from northern Indo-China. All examples of the “Hongkong type” found in the Tabon Caves are made of jade. The surfaces of the ring of the “Hongkong type” may be grooved or plain (Fig. 37-g-h). The projections of the “lingling-o” ear-pendants appear to have been originally derived from a stylized bud design, becoming in many instances a simple point with concave sides (contrast Fig. 37-c and 37-d). Jade bracelets from Duyong Cave and Tabon Cave also have these distinctive projections (Fig. 38-a and b).

Other unique forms of ear-pendants (Fig. 35-a) executed in jade were also found in Duyong Cave. The double headed ear-pendant (Fig. 35-a)—probably horse heads—is perhaps the finest jade ornament found to date in the Philippines, a superb and beautifully proportioned example of ancient carving in jade. Simple ring-like ear-pendants of jade (Fig. 35-f) were excavated in Duyong and Uyaw Cave which are also identical to a type found in Hongkong [cf. Finn (1958) Plt. 46-G and 46-I]. “Lingling-o” slotted jade ear-pendants have also been reported in Taiwan by the late Dr. Tadao Kano (1946), and are known from elsewhere in East Asia.

Bracelets of jade appear for the first time in Late Neolithic sites, as in Manunggul Cave (Chamber A), and continue to be found in jar burial caves until the Developed Metal Age. The jade bracelets are most common, however, in the Early Metal Age sites and bracelets with distinctive projections occur only during this transitional period (Fig. 38-a and 38-b). A sample of 12 jade bracelets from Duyong Cave indicate that they could have been worn by all

age groups; the largest being 9 cm. in maximum diameter, the smallest 5 cm., and the remaining 10 average 6 cm. in diameter. Still smaller jade rings with slots, as noted, were unquestionably ear-pendants or earrings.

Two basic forms of the jade and chrysoprase bracelets were recovered in Duyong Cave and the other Early Metal Age cave sites, in addition to the types of bracelets which have projections. The first is rectangular in cross-section and relatively thin and wide (Fig. 38-d, g and h). A few of these have widely spaced corner-points or facets on the outer surface and some are decorated with grooves (an X-design is also common but not illustrated) made by sawing (Fig. 38-c). The second form of the bracelet is narrower and thicker with convex sides made by grinding and polishing the edges. The forms and cross-sections of the bracelets are shown in Figure 38 and a beautifully decorated example from Tadyaw Cave in Figure 48. Readily recognized marks on the inner edges of the bracelets, notably in the first basic form where the marks have not been removed by grinding, show that the bracelets were made by cutting out a plug with a *tubular* drill. The central opening was made by drilling from both sides of a sheet of nephrite [see Beyer (1948a) 83-97 and Finn (1958) 140-163 for comparative notes on the sawing and drilling of nephrites and other hard stones].

Two types of stud-like objects of jade were also excavated in Duyong and Uyaw Cave, possibly being used to inlay wooden ornaments such as ear plugs. Wooden ear plugs with inlaid designs in mother of pearl were formerly worn by the Tagbanwa and may still be seen among the isolated Pala'wan groups. One type of stud is disk-shaped and pointed with concave sides (Fig. 35-j). The other is oblong with a saddle-shaped crown which may be either plain or have parallel grooves cut with a saw in the concave crown. The stud, Figure 37-i, appears to be a reworked portion of a "lingling-o" ear-pendant.

Jade beads have been found in all of the Tabon jar burial sites except Pagayona Cave (this cave was undoubtedly looted in pre-historic times). Beads of jade are common, however, only in burial caves representing the latest phase of the Late Neolithic and in sites of the Early Metal Age which contain bronze and copper objects and ancient glass ornaments (see Table XII). Ten types of jade beads have been tentatively established which will be described in detail in a separate study of all of the beads encountered in the Palawan excavations. At present, reference will be made only to the five common types of jade beads appearing in Duyong

and Uyaw Cave. These are: (1) large with a diamond profile, regular polygonal cross section, and blunt ends (Color Plate I-A:g); (2) cylindrical with squarish cross section; (3) cylindrical with cross section of irregular polygon and more or less rounded corners; (4) short cylindrical with cross section of irregular polygon, also with more or less rounded corners; and (5) round with large holes (see Color Plate I-A;b through h).

Strangely, few beads of jade were encountered in Duyong Cave which had many beautiful jade ornaments and ear-pendants, but similar types of beads made of chrysoprase or talc were encountered in this cave. With one or two exceptions, there would appear to be little chronological distinction in the types of jade beads, unlike the other beads and ornaments of stone. The jade beads which were first introduced during the Late Neolithic survived into later periods, or the more recently introduced types were similar to the earlier types. Jade beads of the Palawan types were also recovered by Beyer (1948a: 64 and Fig. 27) in Batangas Province.

Ancient beads of stone and glass are a common heirloom item among many indigenous groups in the Philippines and Borneo, but a collection of contemporary beads made by the writer among the local Tagbanwa and Pala'wan have revealed no ancient jade or stone beads, due probably to the practice even today among both groups of including beads, porcelains, jars and other effects as *talang* or "grave furniture."

Although there is no question that nephrite was worked extensively elsewhere in the Philippines, notably in Batangas Province where the writer believes a local but still undiscovered source of nephrite was known and worked, the ornaments of jade found in Palawan appear to have been *introduced* at different periods. Thus, jade beads and bracelets, as well as small quadrangular adzes of nephrite, first appeared in Palawan during the late Neolithic. The distinctive "lingling-o" ear-pendants, however, have not been found in Late Neolithic sites, appearing for the first time in association with bronze tools and weapons and ancient glass beads of the Early Metal Age. Beyer (1948a: 68-69) associates the "lingling-o" ear-pendants with "...mixed Late Neolithic-Bronze Age sites," but it is not clear from his publications whether or not these ornaments appeared in Batangas before or with bronze. The data from Palawan, as noted, shows clearly that they were not brought into this area until the Early Metal Age and were probably made elsewhere. The sites in Indo-China which have yielded identical types of these ear-pendants are Metal Age and apparently usually associated with iron.

*Bronze and Copper.*—The Early Metal Age burial caves such as Duyong and Uyaw have yielded a few implements of bronze, fragments of copper, and Late Neolithic stone tools. Iron is absent or very rare (Table VI) in the Early Metal Age sites. Unfortunately, most of the pieces of bronze or copper were fragmentary, disintegrated, and unidentifiable as to their original forms. The inventory of bronze objects from all of the Tabon Caves excavated to date, including sites with iron is as follows:

- (a) *Socketed Adzes*; a perfect socketed bronze adze was excavated in Uyaw Cave (Fig. 39a) and pottery moulds for making similar forms of adzes were recovered in Duyong Cave and Batu Puti Cave.
- (b) *Socketed Spear Points*; a bronze spear point was reconstructed from fragments found in Uyaw Cave (Fig. 40) and parts of spear points were recovered in Duyong Cave and Tadyaw Cave.
- (c) *Tanged Arrow Point*; an almost perfect arrowpoint (Fig. 40) with winged barbs was excavated in Batu Puti Cave and it is similar in form to types found near Hongkong [Finn (1958) Fig. 26].
- (d) *Blades*; small, plain knives—the cutting edges may be seen—were recovered in Duyong and Pagayona Cave, and the latter cave yielded a long (12.5 cm.) and narrow blade-like fragment.
- (e) *Harpoon (?)*; a narrow length of bronze, triangular in cross-section, which has a barb was excavated in Pagayona Cave, and is probably a harpoon point (Fig. 40).
- (f) *Wire*; fragments of small, round wire of various sizes were found in Duyong Cave and Pagayona Cave.

Tadyaw Cave also yielded two large fragments of what appears to be a crescent-shaped blade with a grooved tang. No ornaments of bronze or copper have been identified, although the wire may have been used for bangles or finger rings.

A small bronze adze (Fig. 39-c) was also recovered from a Pala'wan living in the village of Tagbai, near Quezon, who knew only that it was found by her grandparent. It is certainly from one of the archaeological sites in the Tabon area. Another even smaller bronze adze was excavated in Paredes Rock Shelter, Langen Island, during the National Museum explorations in the El Nido area. This adze was associated with a jar burial assemblage which

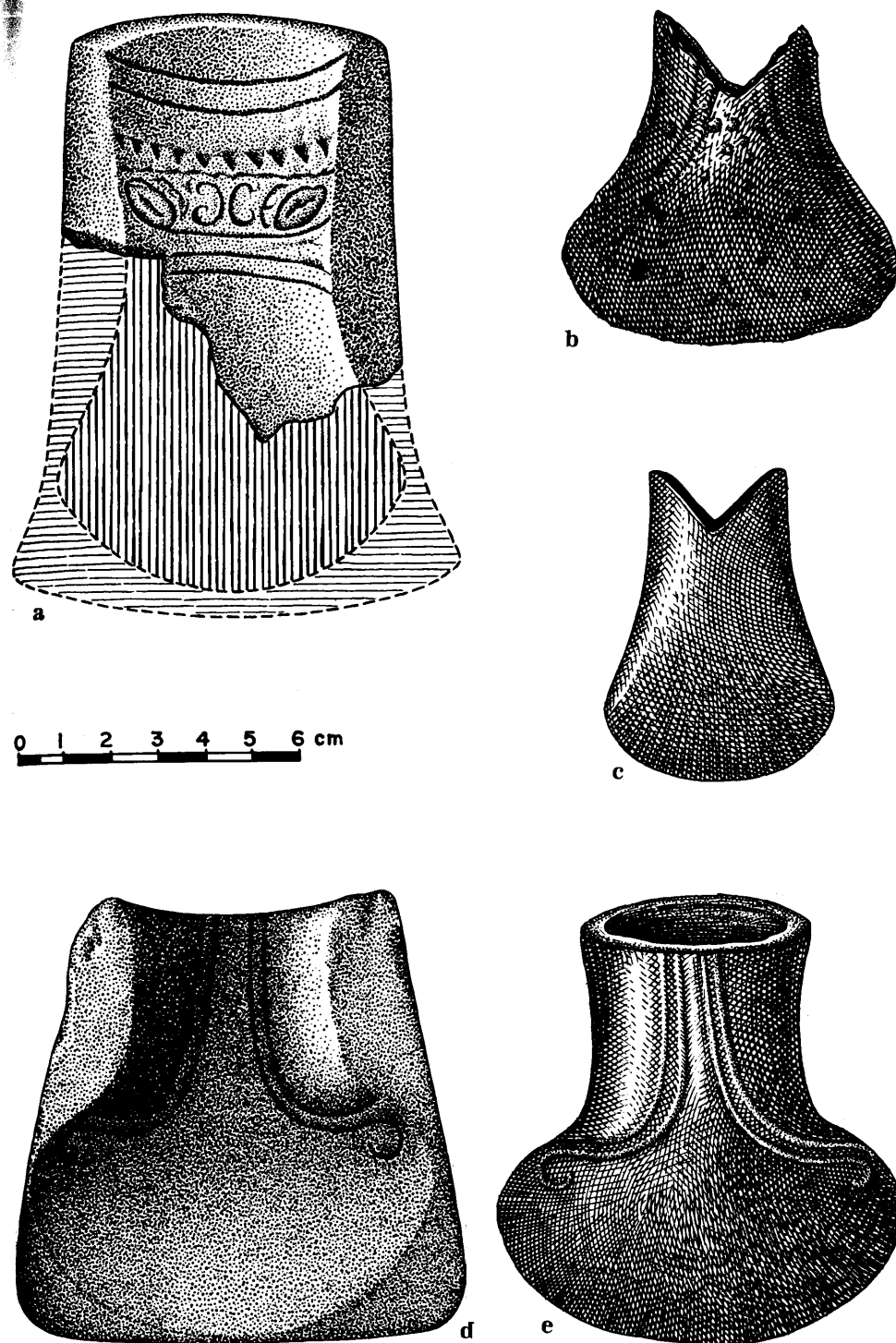


Fig. 39. Bronze Adzes and Fire-Clay Moulds for making Adzes from the Tabon Caves.

included a large barrel-shaped and faceted jade bead identical to a type found in Uyaw Cave. The socketed bronze celts or adzes forms a diagnostic trait of the Early Metal Age in Palawan and probably throughout the Philippines.

An analysis in the Bureau of Mines by Telesforo A. Ejercito and Mrs. Maria Luz M. Bihis made under the direction of Mr. Cecilio R. Sison, Chief, Metallurgical and Laboratory Services Division, of 11 fragments of patinated metals selected at random from eight of the Tabon Caves show that 9 are bronze and 2 copper. Two socketed adzes were also analyzed by them (Table XI) and proved to be bronze.

These preliminary analyses (a more thorough study is planned) suggest that bronze, and not copper which could be obtained locally and worked, was the typical metal of the brief Early Metal Age in Palawan. As bronze contains tin (Table XI) and as tin has not been mined in the Philippines, it is evident that the original bronze was brought into Palawan; further evidence for the extraneous character of the Early Metal Age culture and new movements of people into Palawan and the Philippines at that time. The recovery of two pottery moulds in Duyong and Batu Puti Cave for casting socketed bronze adzes (Fig. 39-a-d) indicates, nevertheless, that the people of the Early Metal Age shaped bronze adzes in Palawan, probably re-using the bronze obtained from damaged or destroyed implements. One fragment of bronze slag was recovered in Duyong Cave. As copper is relatively rare in the Tabon Caves, it would also suggest that the copper implements excavated were also introduced, although there are local sources of copper in the Philippines (and Palawan?).

The shape of the mould for a socketed adze found in Batu Puti Cave (Fig. 39-d) is closely related in form and design pattern to the adze recovered in Uyaw Cave. The two pieces of a pottery mould excavated in Duyong Cave show a unique design pattern (Fig. 39-a) but have generally the same form. Fire clay moulds and bronze adzes from the Hongkong area of South China are illustrated by Finn (1958: Plts. 36-37 and Fig. 12). These show a similar method of manufacture but rather different shapes. It is more likely that the prototypes of the Palawan bronze adzes will be found to be in Indo-China (unfortunately, the writer has not been able to obtain for comparative purposes the early publications of Goloubew, Colani, Mansuy, and others of the "Bronze Age" sites in Indo-China).

Table XI

# ANALYSES FOR COPPER, TIN, AND ZINC OF TWO SOCKETED ADZES FROM QUEZON, PALAWAN

Specimen	Analyses and Percentages		
	Copper	Tin	Zinc
Tagbai Collection	75.65	6.48	0.38
Uyaw Cave	78.75	11.07	0.09

*Carnelian Beads.*—In past excavations on Luzon of Late Neolithic sites, the writer and Mr. Alfredo Evangelista had both been puzzled by the total absence of carnelian beads. Carnelian is a relatively clear chalcedony which is red or reddish-brown in color. Carnelian beads, however, are common in Philippine sites of the Metal Age, as well as in burial sites of the protohistoric period which contain trade potteries from China, Siam, and Annam [Fox (1959b) Color Plate B].

Table XII

# CARNELIAN AND JADE BEADS IN RELATIONSHIP TO THE CULTURAL CHRONOLOGY OF THE TABON CAVES

Cave and Cultural Period	Number of Carnelian Beads	Number of Jade Beads
<i>Late Neolithic</i>		
Ngipet's Duldug	0	0
Manunggul (Chamber A)	0	83
<i>Early Metal Age</i>		
Duyong	8(?)	3
Uyaw	11(?)	27
Tabon*	4(?)	42 (in one infant jar burial)
Guri (Chamber B)	0	6
<i>Developed Metal Age</i>		
Pagayona	19	0
Manunggul (Chamber B)	21	58
Tadyaw*	93	28



Thus, it was not a surprise in Palawan when no carnelian beads were found in burial caves which dated from the Late Neolithic (see Table XII.) Carnelian beads appear in the Tabon Caves for the first time in the Early Metal Age sites, but are most numerous in the later jar burial caves of the Developed Metal Age which contain significant quantities of iron and are a diagnostic bead of this latter period.

Equally significant is the evidence from the excavation of Leta Leta Cave at El Nido, a rich Late Neolithic site. In all, 5,836 beads were recovered in this cave, but only one jade bead and not a single carnelian bead. The archaeological record from Palawan, as well as that from Luzon which is based upon controlled excavations, shows that carnelian and other colorful cryptocrystalline quartz beads appeared during the Early Metal Age in association with bronze and copper, specific types of jade ornaments, and ancient glass; not during the earlier Stone Age. And, in fact, Carnelian beads are common only during the Developed Metal Age and later.

Eleven basic types of carnelian beads, as based upon a preliminary study, have been recovered in the Tabon Caves. These beads are uniformly red in color and translucent (other less common stone beads with mixtures of opaque colors, such as red and cream, are probably jasper). The similarities in the basic forms of these beads with other earlier types of stone beads, as well as the fact that carnelian is not known in the Philippines in these colors, suggest that the carnelian beads were also introduced and possibly had a common origin. The typical and most numerous types are: (1) *round* beads of various sizes some being unbelievably tiny, less than 2 mm. (!), and it is amazing how they were made and drilled from this hard stone; (2) *barrel-shaped*; (3) *bi-conical*; (4) *cylindrical* and long but sloping slightly towards the ends; and (5) *flat with a triangular* profile (see Colored Plate I-A:1 through p). These and the less common types of carnelian and stone beads will be published in color in a future study, as noted, of all of the types of beads recovered in Palawan as well as elsewhere in the Philippines.

The carnelian and jasper beads from the Tabon Cave are very similar to those found near Sa-huynh in Indo-China [cf. Janse (1959) Plt. VI], further evidences of the close relationships between these two areas. The principle source of carnelian is in the south mainland of Asia [Wheatly (1959) 93-93], and carnelian beads are still being made commercially in India. The carnelian beads are drilled in Neolithic fashion and they may date from the Late Neolithic in their places of origin; but, as based upon the excavations in the

Tabon Caves, they did not appear in Palawan until the Metal Age and are most frequently associated with sites containing iron and after formal trade had developed between the Philippines and the Asian mainland.

*Ancient Glass.*—Glass beads and bracelets although very rare (see Table VI) from another diagnostic trait of the Early Metal Age. No glass artifacts were recovered in Duyong Cave. Three unusual glass beads and two fragments of a glass bracelet were screened in Uyaw Cave. An opaque red glass bead from Uyaw is incredibly small, about 1 mm. in size. The red opaque glass beads are typical of Philippine Metal Age sites having iron, but it is now apparent that the smaller types also appeared in very limited quantities during the Early Metal Age.

The other two glass beads from Uyaw Cave are the largest which the writer has excavated in the Philippines, and are rare and unusual types which should be relatively easy to trace to their points of origin. The sides of one of these large beads, a transparent light green glass, are formed like the wings of the cicada and are identical to the designs of the jade ear-pendants (Color Plate I-B:d). The other is a darker green glass, also transparent, and polyhedral in cross-section (Color Plate I-B:e). The glass of both of these beads is impure with many minute bubbles. The two fragments of a bracelet from Uyaw cave are almost colorless. This bracelet, badly eroded and crazed, appears almost round in cross-section although slightly flattened on the inner surface. A handle-like object (ornament ?) found in Tabon Cave, also an Early Metal Age jar burial site, is identical in color and appearance and possibly composition to the bracelet from Uyaw Cave. The quantitative study of more than 160 ancient glass beads from pre-Spanish sites dated by C-14 determinations or associated trade pottery is now in preparation, and will include determinations of the composition of all of the bead types by specific gravity tests, neutron activation analyses, and many chemical analyses; providing data on the origins of the bead types, and other glass objects.

Brief remarks concerning prehistoric glass beads and bracelets found in the Philippines are apropos at this time. Beyer (1947: 234; 1949: 6 and Fig. 12) has argued that glass was made in the Philippines during the "Iron Age," at least in Central Luzon, but he has not presented data to support this view. He notes that Site A in Rizal Province, a major "Iron Age" site, "...dates pro-



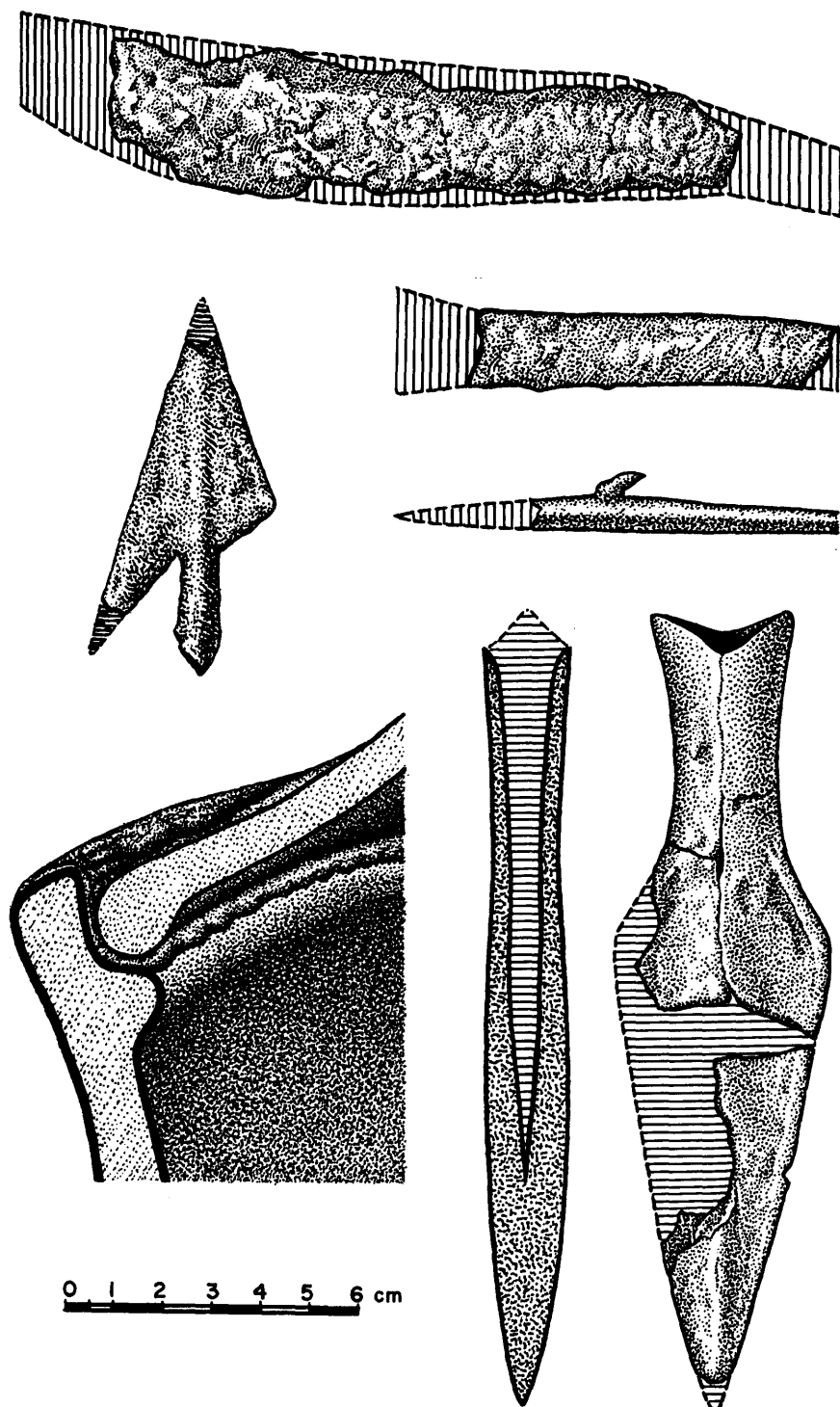


Fig. 40. Bronze Implements of the Early Metal Age and cross-section of Sherds showing cover sealed to jar.

bably between 100 B.C. and 100 A.D." where translucent green and blue glass beads and bracelets "...were locally made..." [Beyer (1949) 6]. In conversations with the writer, Beyer indicated that the evidence for a local manufacture of glass was the recovery of slag and repaired bracelets. He also pointed out that the cobalt-blue beads and bracelets were not made locally, as cobalt has not been mined in the Philippines.

Still, the case for a local manufacture of a translucent green and blue glass is far from settled, at least as based upon the available archaeological evidences. Was the glass made entirely from locally procured raw materials, indicating considerable know-how, or simply by reworking imported glass objects, such as bracelets and beads? Similar and possibly identical types of translucent green glass bracelets from Brunei, Borneo, are found in the Sarawak Museum (other places?). Were the Filipinos during the Metal Age exporting glass bracelets? The entire subject of Philippine glass will require thorough re-study, including actual systematic excavations of key sites in Central Luzon and further analyses and comparisons of the glass materials recovered.

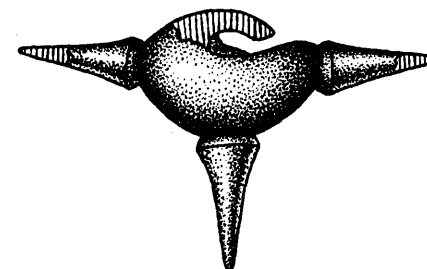


Fig. 41. Glass Ear-Pendant from Rito-Fabian Cave.

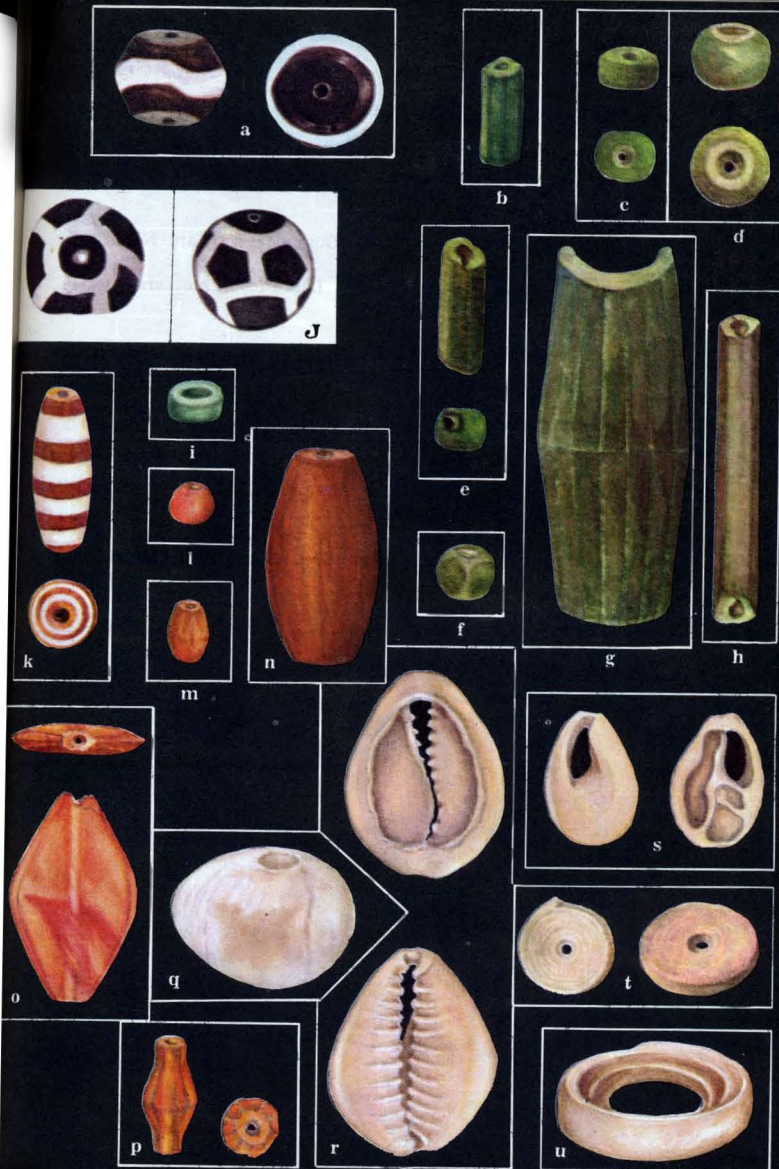
There is no doubt in the writer's mind that the Early Metal Age glass beads and bracelets found in the Tabon Caves were brought by new movements of people into Palawan from probably the south and southwest, along with bronze and copper, the "lingling-o" and other types of jade ear-pendants, carnelian and jasper beads, and a highly sophisticated funerary pottery; possibly shortly before iron appeared. The writer has no comparative data to suggest the origin(s) of the ancient glass found in the Tabon Caves; a guess would be South China and/or Indo-China. It is possible, nevertheless, that the Early Metal Age people brought with them a knowledge of glass-making. They knew bronze and reworked bronze tools in Palawan, as shown by the recovery of fire clay moulds. It is also possible that later external influences led to the development in Central Luzon, as Beyer believed, of a glass making industry during the Developed Metal Age. But, this is still to be documented.

*Shell and Clay Artifacts from Duyong and Uyaw Cave.*—Numerous shell beads of familiar types which date from the Late Neolithic were recovered in Duyong Cave, but were rare in Uyaw Cave. One bracelet made from the top of a Cone shell, probably *Conus litteratus*, was excavated in Duyong Cave, but not a single bracelet made of shell was found in Uyaw Cave. Shell bracelets are characteristic of Late Neolithic sites—14 were found in Leta Leta Cave, El Nido, made from the shoulders of *Conus litteratus* or Limpet shells with the dorsal surface removed—but are uncommon in the Metal Age burial caves of Tabon. It is possible that the shell bracelets and beads were too mundane to be placed in the burial jars with the superb ornaments made of jade and other colorful stones.

Bracelets, *galang*, made of *Tridacna* or large Cones are still fashioned by the Pala'wan people living near the Tabon Caves. These shell bracelets (anklets are also reported) are worn only by the women. As nearly a month is required to complete one bracelet, they are highly prized and expensive. It is noteworthy that the boring and polishing of the bracelets is still done with stone tools, after the bracelets have been roughly shaped and the center opening begun with an iron knife [Romero (1965) 1-12]. The present method of manufacture of these shell bracelets would appear to be closely related to the prehistoric technology.

Exact copies of the "lingling-o" ear-pendant and the pointed studs of jade were also made of shell (Table X), being found in Duyong, Uyaw, and other Metal Age cave sites. This suggests that as the imported jade ornaments were consumed for burial, destroyed or lost, identical forms were made locally with the use of other media, particularly shell. Professor E. Arsenio Manuel has also recovered a clay "lingling-o" ear-pendant in Marinduque.

Shell spoons made from the curved portion of *Nautilus pompilius*, the "Chambered Nautilus," were recovered in Duyong Cave and other metal age sites (Fig. 42). These are also found in Late Neolithic burial caves. Sea shells, probably food offerings, were found in Duyong Cave near collapsed burial jars. A number of bi-valve shells were excavated which had a high sheen along the edge of the shells and which were immediately recognized by the Tagbanwa and Pala'wan workers as "rice scrapers" (see Fig. 42-g). If these are actually agricultural tools, we have suggestive evidence for the appearance of rice or another grain during the Early Metal Age.



COLOR PLATE 1-A: STONE AND SHELL BEADS FROM PALAWAN

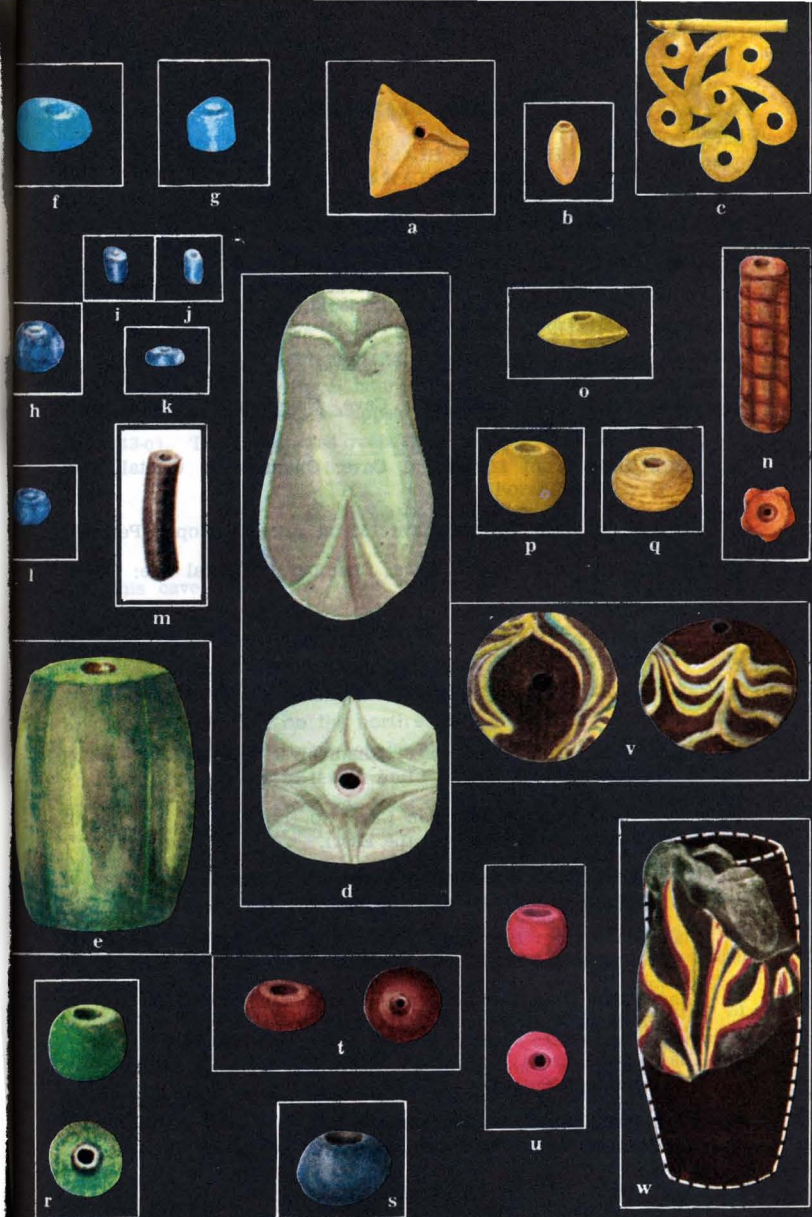
Size x 2: see description on back of page



COLOR PLATE 2-A:

DESCRIPTION OF STONE AND SHELL BEADS FROM  
PALAWAN (X-2)

- A. Onyx bead from Manunggul Cave, Chamber A (Late Neolithic).  
B-H Types of Jade Beads of the Late Neolithic and Early  
Period of the Metal Age.  
I. Shale (?) Bead from Leta Leta and Ngipe't Duldug Caves (Late  
Neolithic).  
J. Acid Etched Carnelian Bead from Guri Cave (Metal Age: Early  
Period).  
K. Acid Etched Stone Bead from Manunggul Cave, Chamber B  
(Metal Age: Developed Period).  
L-P: Types of Carnelian Beads from the Tabon Caves (Metal Age:  
Developed Period).  
Q-U. Characteristic Types of Late Neolithic Shell Beads from Palawan.



COLOR PLATE 2-B:

DESCRIPTION OF GLASS AND GOLD BEADS  
FROM PALAWAN (X-2)

- A-C. Gold Beads from Guri and Tadyaw Caves (Metal Age).
- D. Glass Bead from Uyaw Cave with cicada wing form similar to Jade Ear-Pendants (Metal Age: Early Period).
- E. Glass Bead from Uyaw Cave (Metal Age: Early Period).
- F. Glass Bead from Bato Puti Cave (Metal Age: Developed Period).
- G. Glass Bead from Manunggul Cave, Chamber B (Metal Age: Developed Period).
- H. Glass Bead from Manunggul Cave, Chamber B (Metal Age: Developed Period).
- I. Glass Bead from Tadyaw Cave (Metal Age: Developed Period).
- J. Glass Bead from Tadyaw Cave: Chamber D (Metal Age: Developed Period).
- K. Glass Bead from Tadyaw Cave: Chamber D (Metal Age: Developed Period).
- L. Glass Bead from Tadyaw Cave: Chamber B (Metal Age: Developed Period).
- M. Glass Bead from Guri Cave, Chamber B (Metal Age: Early Period).
- N. Glass Bead from Bubulungan Cave No. 1, Chamber B (Age of Contacts and Trade with the East).
- O. Glass Bead from Bubulungan Cave No. 1, Chamber B (Age of Contacts and Trade with the East).
- P. Glass Bead from Bubulungan Cave No. 1, Chamber B (Age of Contacts and Trade with the East).
- Q. Glass Bead from Bubulungan Cave No. 1, Chamber B (Age of Contacts and Trade with the East).
- R. Glass Bead from Manunggul Cave: Chamber B (Metal Age: Developed Period).
- S. Glass Bead from Bubulungan Cave No. 1; Chamber B (Age of Contacts and Trade with the East).

Two types of clay ear-pendants were excavated (Figs. 43-a and 43-b) which are reminiscent in shape to the jade ear-pendants. The clay ear-pendants were probably made locally. Eight of the first type of clay ear-pendant (Fig. 43-a)—round with a simple curved slot—were excavated in Duyong Cave, an Early Metal Age site; one in Pagayona Cave, a Developed Metal Age site. The second type of clay ear-pendant (Fig. 43-b) has been found to date only in Batu Puti Cave. The half-loop of this clay ear-pendant which fits into the hole of the ear lobe is identical to the loop of the jade ear-pendants (Fig. 37-b), although its overall form is unique. A third clay object—round with a lateral perforation and an impressed groove on the top surface—appears also to be a type of pendant (Fig. 43-c). The latter was recovered in Duyong Cave.

PAGAYONA CAVE

This cave—named in honor of the late Mr. Vicente Pagayona Sr., the modern pioneer of Quezon, Palawan—was discovered only in April, 1964, nearly two years after the Tabon excavations were begun. The cave contained the largest number of perfect or nearly perfect vessels found in any burial cave. Pagayona Cave is located at the base of a cliff on the northeastern face of Lipuun Point, approximately 200 feet above sea level. The cave has a single round chamber, 12.5 meters in length and 8.5 meters at its greatest width, and the floor of the cave was level except for an area in the center which had been disturbed by *tabon* birds (Fig. 44).

When discovered, this small cave was almost filled with jars and other vessels resting on its present surface; a thrilling and remarkable scene when it is remembered that the pottery vessels were about 2,000 years in age. Many of the jars, jar covers, and smaller earthenware vessels were in perfect condition; others composed of large fragments which had merely collapsed in place. A number of the smaller bowls were found nestled in stone cairns along the walls of the cave, and the jars with round bottoms were supported in some instances with stones placed around their bases. All of the forty vessels have been restored and the positions of the vessels in the cave are shown on the floor plan of the cave (Fig. 44).

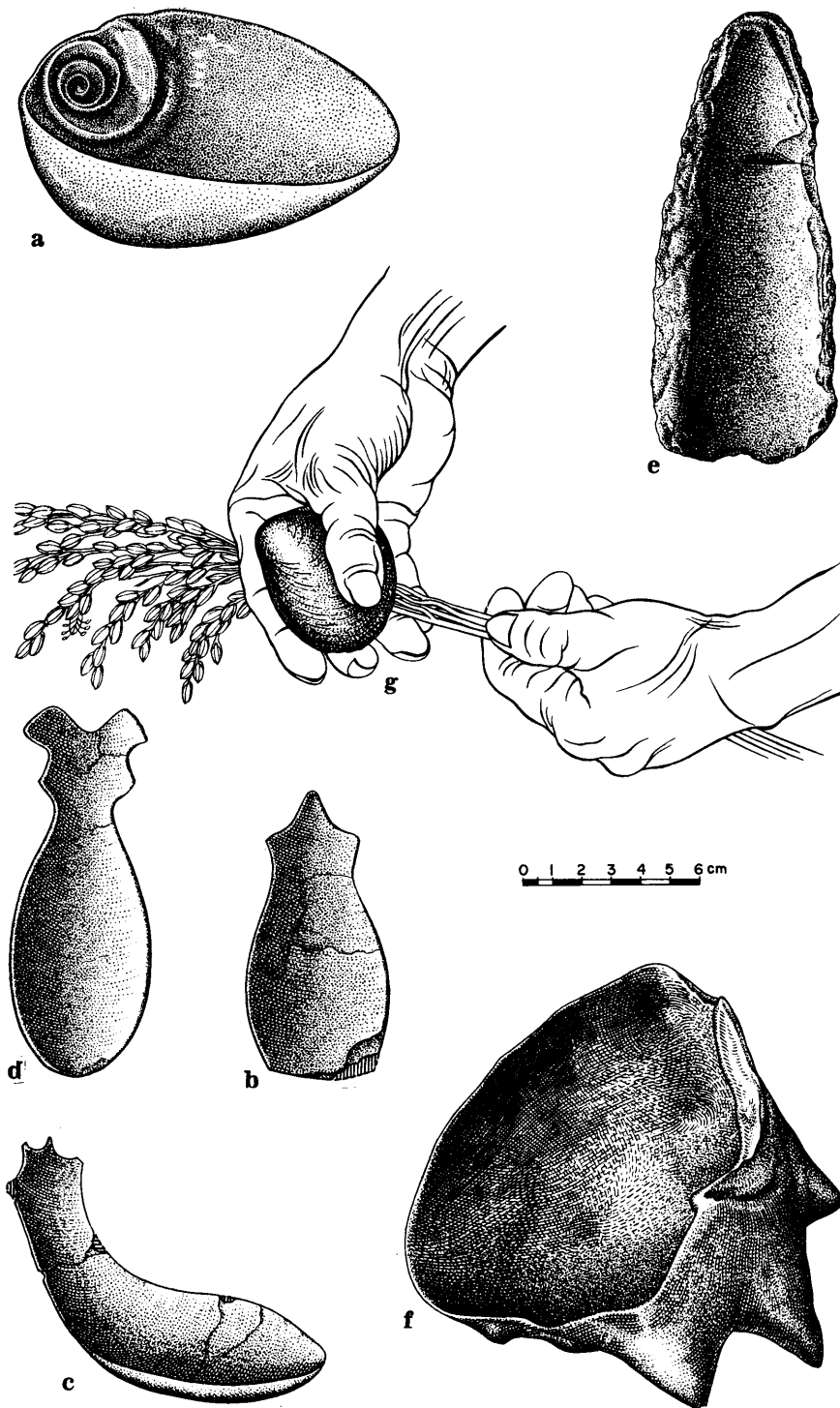


Fig. 42. Shell Artifacts from the Tabon Caves: (a) Scoop made from *Melo diadema*; (b-d) Chamber Nautilus Spoons; (e) Neolithic *Tridacna* shell implement from Duyong Cave; (f) Scoop made from *Cassis cornuta* from Batu Puti Cave; and (g) Shell rice scraper from Duyong Cave.

Few artifacts other than pottery were found on the floor of this cave, but included a shell spoon made from the Chambered Nautilus and a clay ear-pendant which was first found in association with the Early Metal Age assemblage of Duyong Cave (Fig. 43-a). Subsequent screening of the surface and sub-surface deposits also revealed a surprisingly limited number of artifacts; fragments of two iron objects, one of which appears to be a small projectile point; fragments of three bronze implements, a large and small blade and a "harpcon" (Fig. 40); two shell beads of *Nassarius* sp.; 19 carnelian beads of the usual types; and five glass beads, one a light blue glass and other four red opaque glass.

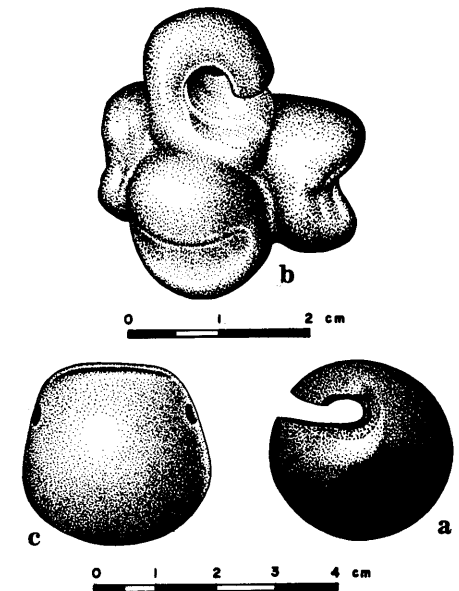
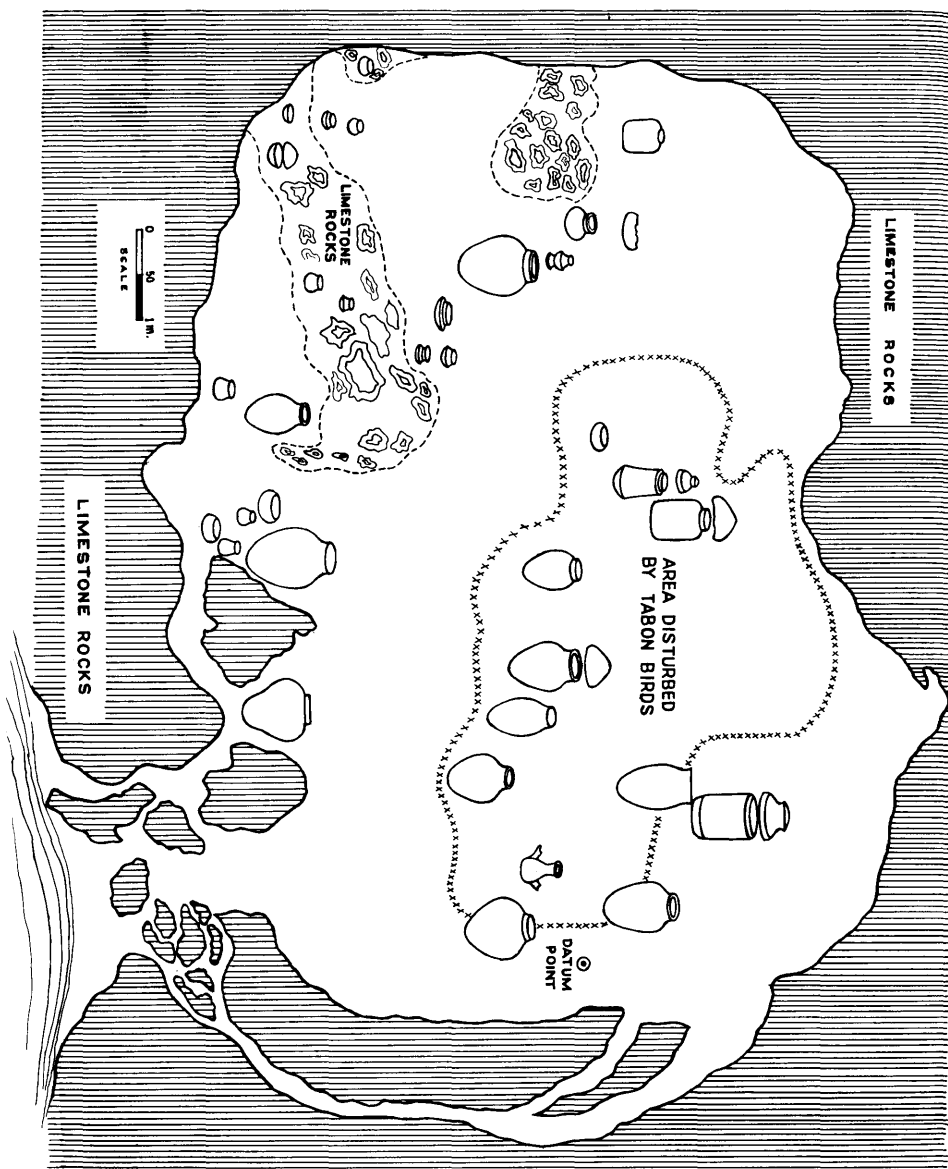


Fig. 43. Clay Pendants: (a) type of Ear-pendant from Pagayona and Duyong Cave; (b) Ear-pendant from Batu Puti; (c) Duyong Cave.

Although it is highly doubtful that Pagayona Cave had been disturbed in modern times, the scarcity of artifacts in the unbroken jars and on the surface of the cave surrounding the jars would suggest that the contents of the jars—ornaments, beads, weapons and tools—were removed or looted at an early date. Human bones scattered around the jars were plentiful indicating that the skeletal remains had not been transferred to another cave. Covers which had been sealed with lime or a compound of lime and resin to the jars had also been removed, providing further evidence of ancient "grave robbing."

Four pottery types of the Tabon Pottery complex were found in Pagayona Cave (see Table VII): *Tabon Plain* which included al-

Fig. 44. Pagayona Cave: Floor Plan Showing Forms of All Restored Vessels and their Positions in the Cave.



most half of the vessels; *Tabon Polished*, a matte finish being common; *Tabon Impressed*, mostly vessels with simple impressions on lips, cord marking and paddle impressions being rare; and only one example of a large bowl used as a cover of *Tabon Incised and Impressed*. This cover combined vertical cord marking below the maximum point of diameter which in turn was cut by incised bands, and an incised scroll design on the shoulder. One pouring vessel with a tall neck has a spout in the form of the head of an animal (dog?) and is illustrated in Figure 45.

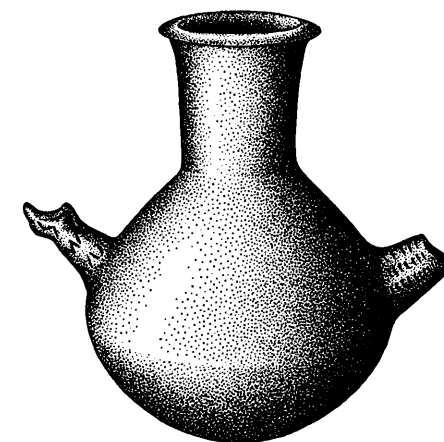


Fig. 45. Spouted effigy vessel from Pagayona Cave (x 2/3 natural size).

Trunconical covers occur and one cover has a unique knob (Fig. 44). Small angle-bodied vessels are common. The vessels used as covers were in most instances simply large bowls inverted over the jars. The bowls with restricted orifices were chipped around the edge of the opening (or the entire neck removed) to facilitate their use as covers.

Although the vessels in Pagayona Cave have noteworthy forms, the decoration is unimpressive. Designs made with a paddle are rare and cord marking is confined to only two vessels. The infrequency of incised design patterns, such as the curvilinear scroll is striking. Although the pottery of Pagayona Cave is related in basic forms and decorations to the Tabon Pottery Complex and typologically may still be identified with this pottery complex, changes in decorative style are apparent. Notable is the simplicity of the decoration, the rarity of paddle and incised designs, and the absence of painting. This trend towards simplicity of decoration may also be seen in the pottery of Tadyaw Cave which contains a related assemblage of artifacts.

Pagayona Cave is clearly Developed Metal Age in date as shown not only by the presence of iron but by types of glass beads which are found in "Iron Age" sites throughout the Philippines, and which are absent or very rare in the Early Metal Age burial caves of Palawan. The age estimate of the jar burial assemblage of Paga-

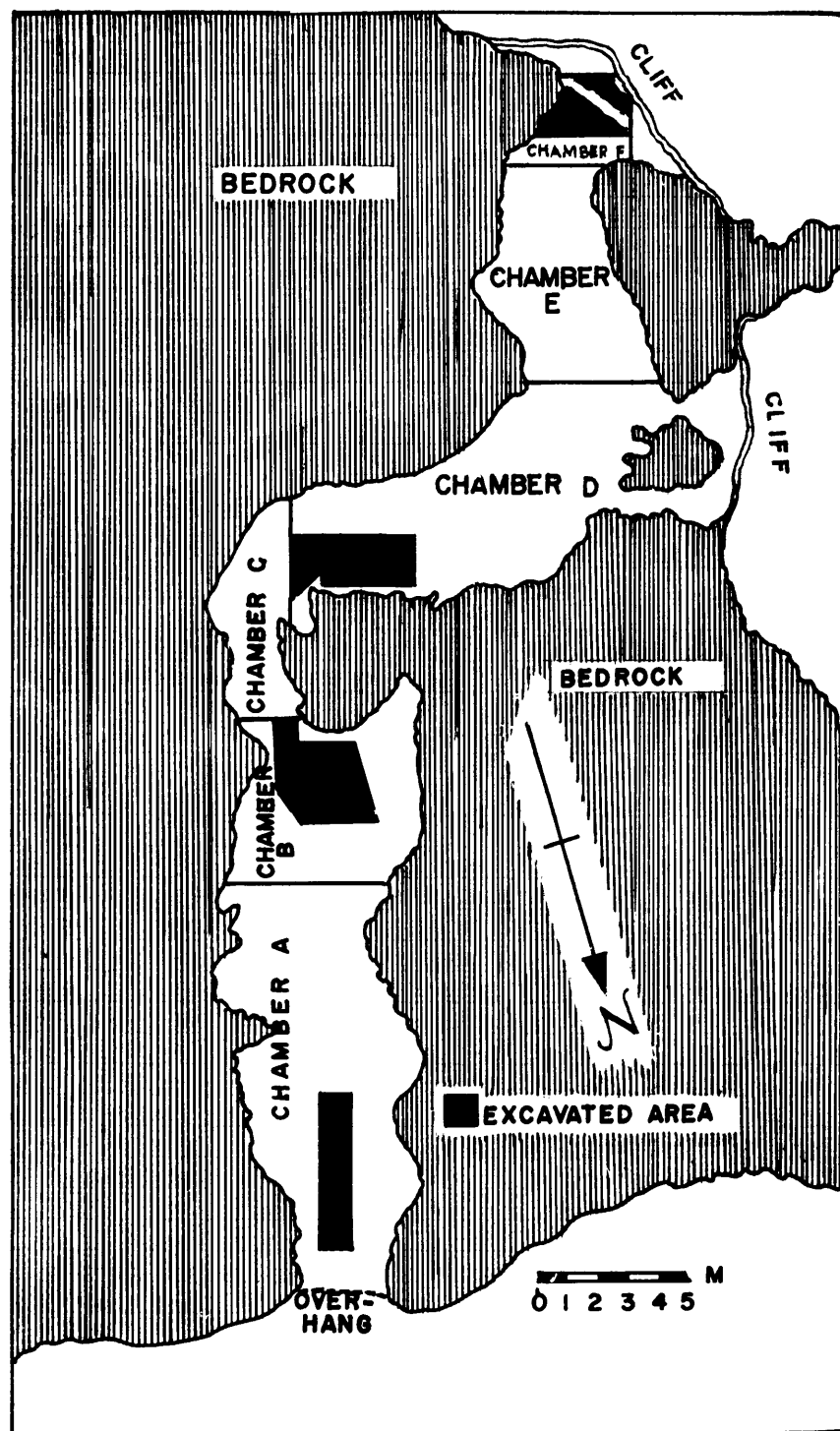


Fig. 46. Floor Plan of Tadyaw Cave

yona Cave is 200 B.C. to 200 A.D. If this dating is correct, then over one thousand years had passed since pottery first reached the Tabon Caves during the Late Neolithic, and changes in the styles of decoration and form would be expected.

#### TADYAW CAVE

This is one of the largest jar burial caves on Lipuun Point; a winding tunnel, 94 meters in length, which passes through a limestone cliff from one deep valley to another (Fig. 46). Tadyaw is the only burial cave on Lipuun Point with mouths which do not face the sea but interior valleys. The front entrance, however, is near a passageway through the towering cliffs which faces the South China Sea, and the cave is easily accessible from this direction. The limestone rocks in the trail through this passageway are worn and highly polished from continual use of the trail today by wild pigs and other animals and probably in the past by movements of people to this great burial cave.

It is estimated that at least 500 jars, jar covers, and smaller vessels are scattered on the surface of this cave. Most of the vessels are located in three dark interior chambers, only a few being found in the front and rear entrance chambers. The pattern in Tadyaw of placing burial jars in interior chamber is unusual. Whole jars, covers, and smaller pots were recovered, but most of the vessels had been broken and scattered by wild pigs and porcupines nesting in the cave (Plate XI). Jars broken while the cave was still being used for burial had been piled by the jar burial people on shelves along the edges of the chambers and the sherds weighed down with small rocks.

Excavations have been completed only in the "rear window" of this cave and preliminary testing begun in the three interior chambers. Completion of the excavation of this cave, extremely rich in artifacts, remains a major task. The excavations have shown, nevertheless, that all chambers of the cave were used for burial primarily during the Developed Metal Age. Numerous fragments of iron were recovered including sizable portions of spear points (47-a-b-e), blades of knives, and chisels (47-f). These have a projecting shank or tang to insert into a handle. The end of one blade is ornamented (Fig. 47-g). Although less numerous, fragments of bronze and copper were also excavated.

Portions of green glass bracelets, triangular in cross-section, were recovered which are similar in type to those excavated in Manunggul



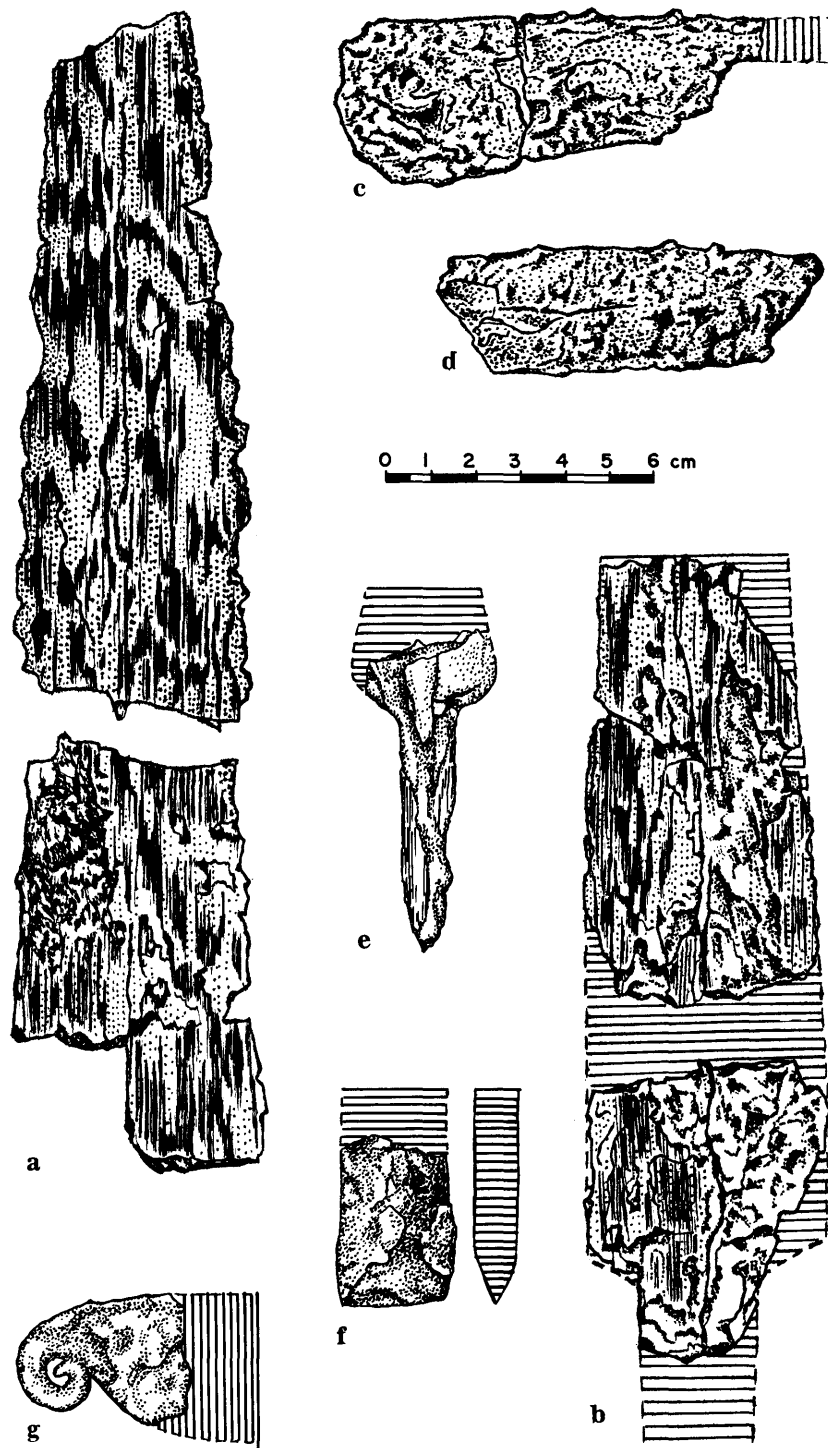


Fig. 47. Forms of Iron Spears and Knives from Tadyaw Cave.

Cave, Chamber B and Area C, the latter having an associated C-14 date of 190 B.C. Four types of Metal Age beads were common: (1) large, light blue glass beads; (2) dark (cobalt ?) blue glass beads; (3) small opaque red glass beads; and (4) large opaque red glass beads. The opaque red glass beads were first encountered in the Early Metal Age sites but are now a very numerous type, as noted, which are recovered in "Iron Age" sites throughout the Philippines.

Stone beads of carnelian, as would be expected (Table XII), are also common, as well as a few beads made of jade. Jade bracelets continue to be found including the half of one which was beautifully decorated (Fig. 48).

Two types of gold beads were screened, one being identical to a type found in Chamber B of Guri Cave (Color Plate I-B:b and c). Other artifacts excavated included shell scoops made of *Melo diadema* and *Cassis cornuta*, pendants of large Olive shells (*Oliva erythrostoma*) fashioned by removing the tip of the crown of the shell, bracelets of shell, and the Neolithic type of disk-like ear-pendant made from the top of a Cone shell (Fig. 19-d). These cultural associations would indicate that Tadyaw Cave was used principally during the Developed Metal Age, circa 100 B.C. to 300 A.D., although the initial period of use may have been during the Early Metal Age. The great number of earthenware vessels would further suggest that this cave was used for jar burial for a number of centuries during the Developed Metal Age.

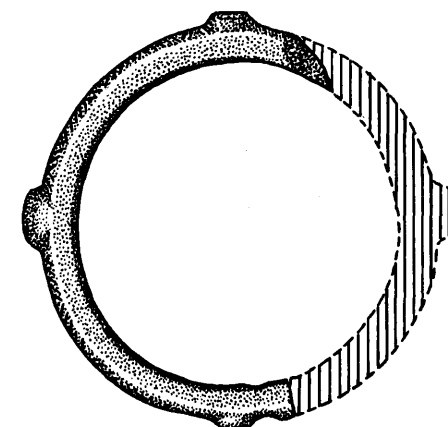


Fig. 48. Nephrite bracelet from Tadyaw Cave.

The simplicity of decoration which characterizes the pottery of Pagayona Cave is even more marked in Tadyaw Cave. Although tens-of-thousands of sherds were examined during the preliminary excavations in Tadyaw Cave, only a handful have incised or paddle impressed designs. One sherd has a rectangular meander incised design. This design is extremely rare in the Tabon Pottery Com-

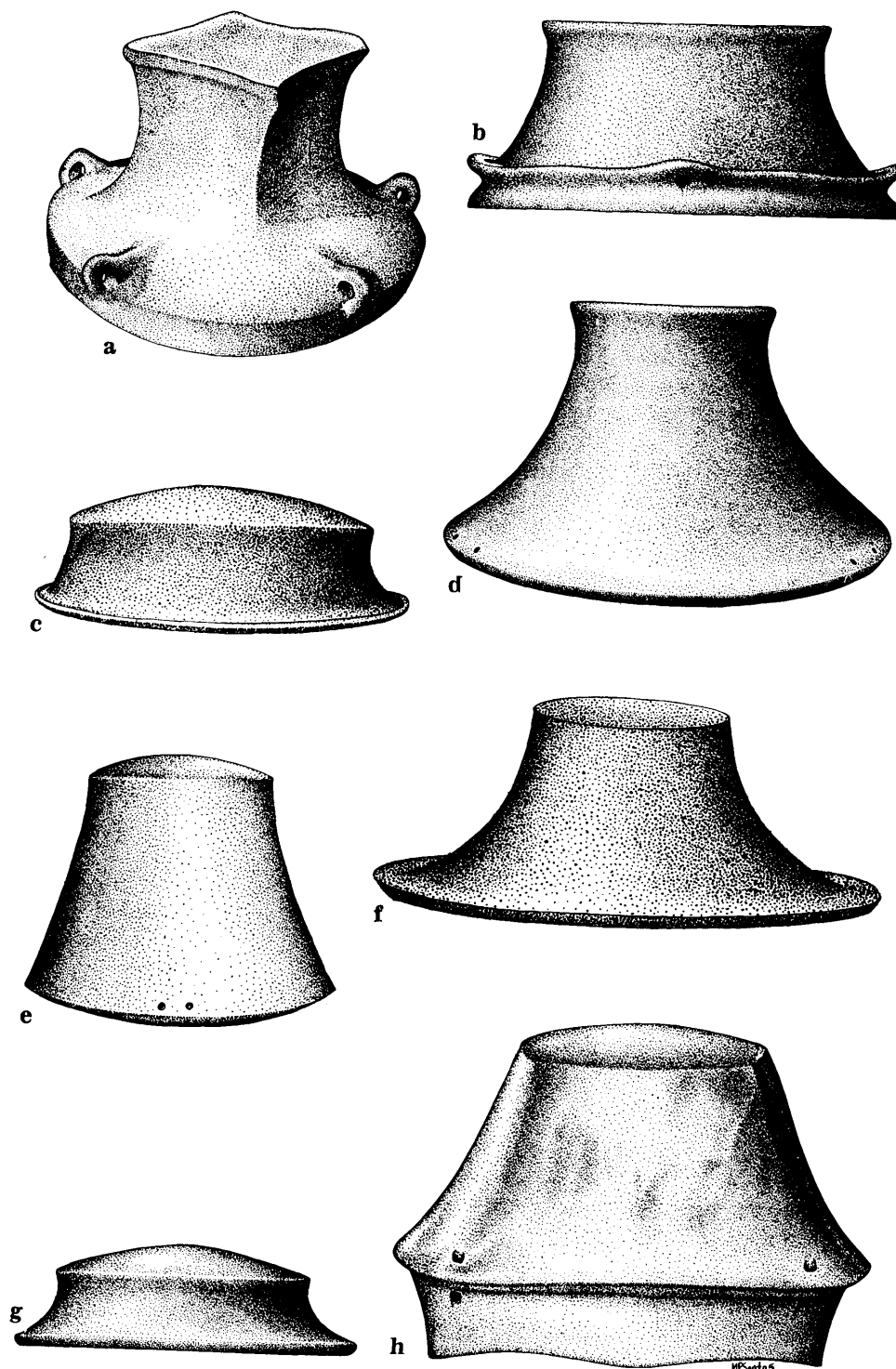


Fig. 49. Forms of Trunconical Covers from the Tabon Caves.

plex, being more characteristic of the "Iron Age" pottery of the Central Philippines. Chamber C of Tadyaw Cave yielded a few sherds with cross-ribbed impressions made with a carved paddle. A unique vessel, almost perfect, was found on the surface of this same chamber. This small spheroid-shaped bowl with a restricted orifice has criss-crossed incised lines on the everted lip and the entire body is covered with an impressed "herring-bone" design. Chambers B and C yielded a few examples of notched rims.

The pottery is predominantly *Tabon Plain* and *Tabon Polished*. Highly polished red-slip ware is rare. A few sherds, as noted, were recovered of *Tabon Impressed*, the designs being confined largely to rim impressions, a few cross-ribbed patterns made with a carved paddle, and one example of cord marking. *Tabon Incised* is represented by only one sherd—a rectangular meander design pattern—and *Tabon Incised and Impressed* by a large fragment of a cover (?) which has *Arca* shell impressions in triangles and bands. *Tabon Glazed* is present but not common. It is possible that the decorated sherds represent a very brief and limited use of Chamber B and C during the late phase of the Early Metal Age, as suggested, but it is more likely that these sherds simply represent traditional design patterns which have persisted despite the trend towards simplicity in decoration during the Developed Metal Age.

The pottery of Tadyaw is remarkable at least for the great number and variety of trunconical covers (Fig. 49), suggesting a local trend during the Developed Metal Age. Angle-bodied bowls are common as in Pagayona Cave. Further chronological relationships with Pagayona Cave are shown by the recovery of sherds of a second pouring vessel with an extremely tall neck similar to the vessel from Pagayona Cave illustrated in Figure 45. In short, significant stylistic changes—simplicity of design and elaboration of specific forms—are also seen in the pottery of Tadyaw Cave (quantitative data will be presented in the final site report on Tadyaw Cave).

The archaeological data presently available would strongly suggest that these stylistic changes were *local* ceramic trends which occurred primarily during the Developed Metal Age. The associated artifacts—types of ornaments in stone and glass and metal implements in bronze as well as some of the pottery types—found in Tadyaw Cave also occur in the Early Metal Age cave sites. Iron and glass, including new types of beads and bracelets, are now present in greater quantities. However, there are no unique horizon markers either in the pottery or associated artifacts which would indicate new and extensive movements into the area at the time that Tadyaw Cave was used.

for burial. Certainly, there must have been new movements of people into Palawan and the Philippines during the Developed Metal Age, increasing external contacts, and possibly the beginnings of actual external trade as Beyer has stressed. But these are strangely not reflected in the artifactual assemblages of Tadyaw Cave and other caves of the same period. More extensive movements of people into Palawan, as indicated by changes in the types of artifacts, seemed to have taken place during the Late Neolithic and the Early Metal Age.

One limestone pillar in Chamber C, Tadyaw Cave, provides the only example discovered of "wall decoration." Incised, parallel lines on this stalactite begin near the top and run down and circle around the pillar. The absence of wall paintings in the Tabon Caves has proved puzzling and disappointing, particularly in view of their presence in the "Painted Cave" of nearby Borneo (Harrisson 1959).

## CHAPTER VII

### NOTES ON THE CULTURAL CHRONOLOGY AND RELATIONSHIPS OF THE JAR BURIAL COMPLEX OF THE TABON CAVES AND PALAWAN

Burial in jars—primary and secondary, multiple and partial — has been encountered throughout the Philippine Archipelago in prehistoric sites which range in date from the Late Neolithic, beginning by at least 1000 B.C. (probably earlier), to the 16th century A.D. shortly before Spanish contact. Jar burial, in fact, is still practiced by some indigenous groups in the Philippines and Borneo [see Appendix I and Harrisson (1962) 10],

Jar burial ("urn burial," "bone jars," etc.) has been reported from throughout the Far East—Japan (Mori 1956), the Ryukyu's (Kokubu and Kaneko 1962), Taiwan (Kokubu 1956; Mabuchi 1956), China, Indo-China, Borneo (Harrisson 1962), and Indonesia (Heekeren 1956) and from South Asia and India. Beyer early recognized the presence of a widespread jar burial complex in the Philippines and identified a "Jar Burial Culture" with the migration of people from South China into the northern Philippines during the "Early Iron Age" [Beyer (1948b) x-xi]. Both Fox (1959a: 22-23) and Solheim (1960: 144-145) have introduced notes of caution concerning Beyer's interpretation of the origin and dispersal of jar burial; and, since 1956, much new archaeological data from Philippine sites have become available. Furthermore, the present data from the many jar burial caves in Palawan is not compatible with Beyer's earlier views. It is necessary at this time to review briefly the general subject of jar burial in the Philippines and the possible time and space relationships of the jar burial complex recovered in the Tabon Caves and Palawan with other regions.

*Background Data on Jar Burial.*—During the pre-war years, according to Beyer (1947), pre Spanish jar burial sites had been found in Babuyan-Batanes islands; Mindoro; Luzon, specifically in the provinces of Camarines Sur, Tayabas (Quezon), and Sorsogon; Masbate; Marinduque; Samar and Negros in the central Philippines; and Zamboanga Province and Basilan Island to the South. Jar burial sites were also discovered on many other islands and provinces by Dr. Carl Guthe during the University of Michigan Archaeological Expedition to the Philippines from 1922 to 1925. Dr. Guthe's data were not published or made available generally to Beyer, however, which greatly qualified Beyer's (1948b; x-xi) interpretation of the distribution and characteristics of jar burial in the Philippines.

*Primary* jar burial found in open sites was apparently considered by Beyer as the "early type" and the "true jar burial" [Beyer (1947) 268 and 350]. The "true jar burial," according to Beyer, was best represented by the recoveries in burial sites found near the town of San Narciso on the Bondok Peninsula, Quezon Province, Luzon; at Filar, Sorsogon, and near Catbalogan, Samar. The San Narciso area of Quezon, Luzon, was first excavated by Mr. Ricardo Galang of the National Museum in 1938, but no site report was published. Fortunately, in 1950, the excavations at San Narciso were renewed by Dr. Wilhelm G. Solheim II and Dr. E. Arsenio Manuel of the University of the Philippines. Preliminary statements on these excavations have been published by Solheim (1951; 1960).

Solheim's reports (1951; 1960) on the Recudo and Tumagudtud jar burial sites at San Narciso actually show at least two jar burial practices: (1) primary burial in large jars which have cylindrical forms, round bottoms, and high straight necks (it is probable that there was also multiple primary burial); and (2) secondary burial of infants in small globular jars. He notes: "All of the jars, at the one time, had stone covers made from a coral limestone..." and that "...each jar had either an iron point or points, or a few beads and possibly a glass bracelet" [Solheim (1960) 132]. The sites are thus Developed Metal Age in date.

Open jar burial sites have also been found in Sorsogon and Samar Provinces which Beyer (1947: 268) believes are of "...the same general type..." as those in San Narciso. Jars in these sites were also associated with iron tools, and the jars in the Samar site had covers of worked "stone" provided with grooves to fit over the rims of the jars. Solheim (1954) excavated another jar burial site at Makabog, Masbate, with glass beads and bracelets and with generally similar types of burial jars and limestone covers. He notes [Solheim (1954) 65] that the Makabog site "...probably dates from the Early Iron Age."

During the pre-war years a number of persons [see Beyer (1947), 210-212] made brief explorations and rather haphazard excavations in the jar burial sites of the Batanes and Babuyan Islands, north of Luzon, where the jars were commonly placed in stone cairns. With little evidence and probably influenced by the geographical location of these islands, Beyer (1947: 210) arrives at the rather contradictory conclusion that the Batanes "jar burial culture" was "...perhaps the oldest jar burial type in the Philippines—going back to the early centuries of the Christian Era." Brief excavations by Solheim (1960) in the Babuyan and Batanes Islands suggest, on the

contrary, that the jar burials there appear to be relatively late; the burials that he found being associated with either iron implements and glass and carnelian beads or associated with trade potteries from South China which are probably Sung (Early ?) in date. Manuel (1953) has also shown that jar burial in the Batanes Islands was practiced as late as the 18th century A.D.

The Babuyan-Batanes islands, as shown by the previous work, are extremely rich in jar burials, and the large number would indicate that the practice was followed for a considerable span of time [Solheim 1960 127]. It is possible that further systematic excavations in this area might reveal an even older Late Neolithic jar burial assemblage, but based upon the present evidence the Babuyan-Batanes jar burial assemblages are Metal Age in date and proto-historic.

Utilizing the data from pre-war recoveries, Beyer reached the conclusion that the practice of burial in jars was introduced by a "Jar Burial People," probably by a Hakka tribe or a closely related group, from Fukien Province or from "...some other area on the central China coast" [Beyer (1948b) x-xi]. He dates the movement from about the 3rd to the 8th century A.D., falling into the "Iron Age." Having its origin in the north, Beyer believes that the people of the "Golden Urn Burial" migration first reached the Batanes and Babuyan Islands where they passed down the east coast of Luzon, Samar, and Mindanao, crossing into the Celebes. An off shoot of this migration crossed southern Luzon, in the area of the Bondok Peninsula, passing into Marinduque Island and from there to Mindoro, the Calamian Islands, Palawan, and finally into Borneo where it died out according to Beyer (1948b: xi).

As pointed out by the writer [Fox (1959a) 22] and by Solheim (1960: 145), Beyer's description of the spread of a jar burial tradition by a migration of a people during the 'Iron Age' is not supported by the present far more detailed archaeological record. First, the excavations in the Bato Caves, Sorsogon Province, and on Cagraray Island, Albay Province [Fox and Evangelista 1957a and 1957b] and now in Palawan—excavations which have associated C-14 dates—show that pottery and the practice of burial in jars entered the Philippines during Late Neolithic times. Mr. Alfredo Evangelista of the National Museum also excavated a jar burial site in Carranglan, Nueva Ecija, which is Late Neolithic in date. The small, spheroid-shaped jars, obviously secondary burials, had similar spheroid-shaped covers. Stepped adzes were associated with these jars. The interior location of the Carranglan site is unique, for heretofore jar

burial sites have been found only along the coasts or near coastal regions of the Philippines.

Secondly, as Solheim (1960: 144) has pointed out, the pottery (and the writer would add the types of associated artifacts) recovered in the many jar burial sites throughout the Islands show marked variation which is not consistent with the view that the practice of jar burial was spread by the migration of a single people.

Finally, the present excavations in the Tabon Caves demonstrate that the closest affinities of the Tabon Jar Burial Complex is with Borneo and Indo-China, and came into Palawan, the author believes, from the south and southwest. Moreover, "urn burial" is encountered in Indonesia, as in west Java (Heekeren 1956), and did not die out in Borneo during its supposed movement from the Philippines to the south as Beyer (1948b: xi) writes. It is also far more likely that jar burial was introduced into Indonesia, as in Palawan, from the south mainland of Asia, rather than from the northern Philippines.

There is a considerable evidence, however, of a jar burial complex reaching the Philippines from the north, as Beyer argues. Suggestive relationships of the Babuyan-Batanes jar burials are seen with Formosa (Solheim 1960) and with jar burials in Japan (Mori 1956). It is not reasonable at present, however, to continue to attribute the presence of jar burial in the Philippines solely to the migration of a Hakka people from Fukien Province or the central coast of China during the "Iron Age." Rather, it is now apparent as the author has pointed out [Fox (1959a) 22-23] that jar burial has appeared in the Philippines as the result of a number of distinct movements of people, the influences coming from the south and possibly from the north and beginning in the Late Stone Age. Jar burial in the Philippines also involved much local development and specialization.

*Cultural and Temporal Sequences of the Jar Burial Complex Found in the Tabon Caves.*—That a number of actual movements of people were involved in the appearance and development of jar burial as found in the Tabon Caves and Palawan is clearly shown by the abrupt changes in the types and materials of tools and ornaments associated with the jar burial complex, as well as by some stylistic changes in the forms and decorations of the pottery. It has been possible on the basis of a number of C-14 dates and seriation studies to establish time sequences which are roughly equat-

ed with changes in the jar burial complex. Unfortunately, as noted in the *Introduction*, the archaeological data on the cultural sequences which include jar burials in the Tabon Caves, as well as elsewhere in Palawan, were derived almost entirely from the study of burial practices. No habitation sites of the people who buried their dead in jars in the Palawan caves have been discovered.

That the practice of jar burial as found in the Tabon Caves came from the south and southwest, not from the north, is suggested by a brief comparative study of the characteristics of the pottery, as well as of the associated tools and ornaments, with other pottery complexes and archaeological assemblages found in Southeast Asia. The Tabon Pottery Complex, as discussed, shows striking similarities with the pottery of Niah in Borneo, Malaya, and Sa-huynh in Indo-China and Thailand, but differs greatly from the pottery and artifacts of the central and northern Philippines. This is demonstrated by the absence (or rarity) of cord marking and carved paddle impressions in the Kalanay Pottery Complex of the Philippines. The Tabon Pottery Complex has cord marking (and paddle impressed designs) as a major feature of surface treatment which, as noted, appears among the early potteries of Thailand (Sørensen 1967) and Malaya (Peacock 1959).

It is now known that pottery was made in the Philippines during the Late Neolithic and that both cord marking and paddle marking were associated with the Late Neolithic of Palawan and very common during the Early Metal Age. Carved paddle and bound paddle decoration also survived into the Developed Metal Age of Palawan, but these types of decoration are relatively rare in the jar burial sites which contain iron. In short, this trend—the disappearance of paddle impressed designs in Developed Metal Age sites—may also have occurred elsewhere in the Philippines which explains the general absence of paddle decorations in the "Iron Age" sites of the Kalanay Pottery Complex. Or, more likely, if paddle impressed designs entered the Philippines from the southwest, as the writer believes, it may have faded out as a major type of surface treatment while diffusing to the central and northern Philippines during the Metal Age. It should also be pointed out that carved paddle decoration is still known to the peoples of Palawan and Mindanao, but is apparently not used by contemporary potters in the central and northern Philippines.

The archaeological evidences from the excavations in the Tabon Caves, specifically the temporal change in the basic technology and the types of ornaments, suggest a number of separate movements

of people into Palawan during the Late Neolithic and Metal Age. All of these people possessed in their cultural inventory a highly sophisticated pottery and practiced jar burial. The evidences for a few such movements are considered briefly at this time. By "movements" the writer does not mean a movement or "waves of migrations" as set forth in past discussions of Philippine culture history. The term "movements," as used here, implies small-scale movements by boat of probably kin-oriented groups along the coasts bordering the South China Sea basin. The ethno-historical record would suggest, too, that these groups were relatively mobile shifting cultivators, supplementing their daily diet with extensive food gathering, fishing, and hunting. They probably lived in small scattered hamlets near the coast and along rivers, and used the extensive limestone outcroppings which were honeycombed with caves for formal burial sites.

Four sharply demarcated periods of cultural change which reflect new movements of people (and ideas) into Palawan during the period when the Tabon Caves were used for jar burial are reflected in the archaeological record from Palawan and are considered herein:

(1) *Late Neolithic Period; Early Pottery Phase.* — Movements which began in the late Neolithic, at least 1000 to 1500 B.C., and probably earlier, when pottery was first (?) introduced into Palawan and the Philippines. These movements are represented by the recoveries in Ngipe't Duldug Cave, Lipuun Point, and Leta Leta Cave at El Nido. The pottery is associated with small quadrangular adzes-axes, gouges, and chisels, sometimes made of nephrite, including stepped forms. Stone sawing and boring was practiced. Ornaments—beads, pendants, and bracelets—were made primarily of shell. Jade beads and bracelets appeared in limited numbers for the first time, but the "lingling-o" types of ear-pendants were not yet known. Beads were also made of a shale (?) or microcrystalline quartz but principally shell. Household items such as awls, scoops, and spoons were also fashioned from shell.

The pottery was relatively plain when compared with the Early Metal Age wares but included cord marking, paddle impressed decorations, and rare incising. Red slipped vessels which were highly burnished were present. Simple flat bottom bowls were common. It is noteworthy that the pottery of Leta Leta Cave, El Nido, included numerous chalice and goblet-like forms which were undoubtedly associated with ritual drinking of wines (beers) made probably of rice or wild honey.

Jar burial was not common (absent ?) when pottery was first introduced into the Philippines during the Late Neolithic. Other types of burial which are associated with the early stone tool and pottery assemblages of the Late Neolithic included primary flexed burials and secondary "bundle" burials. The bones of secondary burials were painted with hematite.

(2) *Late Neolithic Period: Developed Jar Burial Phase.*—Movements into Palawan and elsewhere in the southern Philippines during the Late Neolithic which were associated with a highly decorated funerary pottery and a developed jar burial complex, being represented by the recoveries in Chamber A of Manunggul Cave. The Late Neolithic pottery of Manunggul Cave shows striking relationships with the Sa-huynh pottery of Indo-China. The unique trunconical jar covers found in Indo-China and Malaya appear for the first time as shown by the recoveries in Manunggul Cave. Cord marked and paddle impressed potteries are now common.

Chamber A of Manunggul Cave has two associated C-14 dates, as noted, of 890 B.C. and 710 B.C., but the classic sites in Indo-China with potteries similar to those found in the Tabon Caves are fully Metal Age in date and the "...Sa-huynh site is definitely of the iron age" [Finn (1958) 156]. It is highly improbable that the Metal Age sites of Sa-huynh in Indo-China would be ancestral to Neolithic sites in Palawan, and it would seem that there must be older sites with Sa-huynh pottery or related types of pottery on the south mainland of Asia—China, Indo-China, Malaysia or Thailand.

Jade beads and bracelets began to appear at this time in significant quantities (see Tables X and XII), as well as beads, pendants, and bracelets made of onyx, jasper, and agate; but there were no "lingling-o" type of jade ear-pendants.

(3) *Metal Age: Early Period with Bronze, Jade, and Ancient Glass.*—Movements during the Early Metal Age which saw the first introduction of metals—bronze, copper, and gold, possibly "drift" iron—many ornaments of jade including the diagnostic "lingling-o" ear-pendants, and beads and bracelets of ancient glass. The pottery continued to be highly decorated and had a great variety of forms. All of the types of the Tabon Pottery Complex were now present. Paddle decoration was characteristic of this period, as well as design patterns which were incised and then emphasized by painting with hematite.



Late Neolithic types of polished stone tools were still used during the earliest period of the Metal Age (Table VI). There was no "Bronze Age" as such in Palawan or, the writer believes, elsewhere in the Philippines. The typical burial items of this period—bronze implements and ornaments of jade and ancient glass—were obviously rare and highly treasured objects. These items disappeared quickly due in part to their being used as "grave furniture." Among the contemporary peoples of Palawan, it is the exotic and rare material culture that are used as grave furniture and linked with the cult-of-the-dead.

One gains the impression that the jade ornaments and ear-pendants were not locally made but were carried into Palawan through the actual movements of people. At the same time and later, these ear-pendants were duplicated in shell. Working in nephrite was extensively developed in Batangas during the Neolithic, as Beyer (1948a: 83-97) has shown. The "lingling-o" types of jade ear-pendants were also found in Batangas but in sites which apparently also yielded bronze objects. These ear-pendants are more common in Palawan than in Batangas, at least the largest number recovered to date in the Philippines being from the Tabon Caves and Palawan. If the origin of these ornaments is northern Indo-China, as Finn and others believe, then these ear-pendants may well have come into the Philippines through Palawan diminishing in numbers as they were carried into Batangas and the central and northern Philippines during the Early Metal Age.

The Early Metal Age was brief, a maximum time span as shown by the C-14 dates from the Tabon Caves of about 500 years, circa 700 B.C. to 200 B.C. If the Late Neolithic persisted in Palawan to after 700 B.C., then this transitional period would have been ever shorter, 500 B.C. (or later) to 200 B.C.

(4) *Metal Age: Developed Period With Iron.*—Movements also occurred during the Developed Metal Age when iron appeared, beginning about 200 B.C., as established by the C-14 date from Chamber B of Manunggul Cave. It should be emphasized that iron did not reach all of the areas and islands of the Philippines at this time, the Stone Age surviving into even the Christian Era in some regions. Jade beads and bracelets continued to be used in the Developed Metal Age, as in Tadyaw Cave, but in decreasing numbers. Many types of beads of glass, glass-paste, and carnelian were now common, and a few clear, green glass bracelets. The iron tools and weapons had a solid haft or tang, as Beyer (1948a: 65) has pointed out.

There were few striking innovations in the pottery of the early phase of the Developed Metal Age, at least these are not revealed in the excavations in the Tabon Caves. Stylistic trends may now be noted, however, as in the trend towards simplicity of design and in the elaboration of specific forms. Paddle decoration was rare in the Developed Metal Age of Palawan. Elsewhere in the Philippines during this period paddle decoration was also absent or very rare. Incised designs were typical of the pottery of the Islands at this time, as in the Kalanay Pottery Complex of the Central Philippines. Incising was also present during this period in Palawan, but less common than in the central and northern Philippines.

Beyer believes that "...a well-developed iron smelting and forging culture, as well as the arts of glass-making, weaving, and pottery manufacture..." came into Batangas "...from South India through the Malay Peninsula and Borneo [Palawan?], probably not earlier than the 2nd or 3rd century B.C." [Beyer (1948a) 66]. This estimate for the first introduction of iron agrees very closely with the archaeological record from Palawan. It is now known, however, that pottery was of Late Neolithic introduction into Palawan, as well as other areas of the Philippines, and appeared to have its closest relationship with the pottery of northern Indo-China, South China, Malaya, Thailand, and Borneo. Whether or not glass was made in the Philippines during the early phase of the Metal Age or simply reworked from introduced glass is still open to question. Iron, as well, may also have come from Indo-China or South China and not from India, although the association of iron and carnelian beads—the latter are probably from India or from South Asia—is highly suggestive of a South Asian origin of iron.

Generally, the archaeological record from Palawan indicates that it was during the periods of the Late Neolithic and the subsequent short lived Early Metal Age, not the Developed Metal Age, which witnessed extensive movements of peoples and ideas into Palawan; and that genetic ties were mainly with Indo-China and South China, secondarily with Malaya and Thailand. Indian influences appear to be much later in date, although the recovery of carnelian beads, and other unique types of Near Eastern (?) beads suggest, as noted, the beginning of influences from India during the early phase of the Developed Metal Age.

The southern and southwestern affinities of the cultural materials found with the jar burials in the Tabon Caves, that is, affinities with Borneo and the south mainland of Asia, may be explained to a great extent by the geographical characteristics of the South China



Sea basin which allowed for relatively easy movement of people by water. Mallaret (1959: 120) has described this circumscribed maritime area as an "Asiatic-Mediterranean" which "...from early times was crisscrossed by numerous navigators." Within the Philippines, the writer has shown how cultural and linguistic similarities developed and persisted around the margins of the inland seas, such as the Sulu Sea, due to the ease and rapidity of movements of people by water [Fox (1957) 3-4]. The term "crisscrossed," as used by Mallaret, probably describes more accurately however the later periods of proto-historic movements. The author would argue that the earlier peoples sailed along the coasts of the South China Sea basin, reaching Palawan via the north coast of Borneo. The many bays and mouths of rivers along the coasts offered not only protection but a ready source of protein foods for migrating peoples. The open South China Sea, swept by the winds of the prevailing monsoons during most of the year, is anything but pacific, and is in fact extremely dangerous to small boats.

The successive movements of people into the island world of Southeast Asia during the prehistoric period involved integrated complexes of culture traits, as Heine-Geldern (1932) early stressed, not simply the diffusion of a diagnostic pottery or the practice of jar burial. The excavations in the burial caves of Palawan clearly reveal such a trait complex—a *highly developed cult-of-the-dead*. Component traits of this cult-of-the-dead included jar burial, a ritual and funerary pottery, body maceration and bone washing, painting bones with hematite, the use of ships-of-the-dead, and grave furniture which was rare and highly valued. A cult-of-the-dead persists to this day in Palawan as an intrinsic feature of traditional religious beliefs and practices among the indigenous peoples, such as the Tagbanwa and Pala'wan, and still involves the use of spirit boats, elaborate grave furniture, and so forth.

In summary, as Chang (1962: 17) has emphasized, "...the civilizations of South China and northern Indo-China during the late first millennium B.C. and the beginning of the first millennium A.D. are of extreme importance to the study of the culture history of Southeast Asia as a whole." The excavations in the Tabon jar burial caves strongly support the view that developments in Indo-China and South China mediated through Borneo have had a great impact upon the culture history of Palawan and the Philippines generally. Although little archaeological data is available, Thailand and Malaya, too, certainly played an important role in influencing social and cultural developments in Palawan.

## CHAPTER VIII

### TEST EXCAVATIONS AND EXPLORATIONS IN PALAWAN

Explorations from time to time in the nearby Quezon area by members of the National Museum Field Team during the period from 1962 to 1966 have revealed thirty-five cave sites in addition to the twenty-nine cave sites found on Lipuun Point. Explorations were also made in the Ransang area south of Quezon and in the El Nido area on the northwest coast of Palawan which revealed nineteen additional cave sites. In all, eighty-four cave sites (see Table XIII) were found along the west coast of Palawan, and it is certain that many other cave sites will be discovered during future explorations of the many limestone exposures.

Table XIII

#### STATUS OF ARCHAEOLOGICAL EXCAVATIONS AND EXPLORATIONS OF CAVE SITES ON PALAWAN ISLANDS THROUGH 1966

Name of Area*	Number of Caves		Caves		Caves not excavated but which contained surface artifacts
	Discovered	Completely Excavated	Partly Excavated		
Lipuun Point	29	9	7		13
Iwaig	10	2	2		6
Kalatagbak	10				8
Kuruswanan	3	1	1		1
Taglumot	1				6
Tumarbong					
(Anunug)	6				6
Sareg	5				
Balabag Cliffs	1	1			5
(Ransang Area in Southwestern Palawan)					
El Nido	19	6	2		11
Totals	84		14		51

\* See Figures 2 and 5 for the locations of the areas described.

The principal objectives of the extensive exploration were to find new habitation sites of Palaeolithic Man, as well as cave sites which would fill in the gaps in the cultural chronology of Palawan, particularly Early Neolithic sites. And, as hoped, the test excavations and surface collections during the numerous periods of exploration did yield data on cultural sequences which were not encountered in the Tabon Caves. A number of these cave sites have been selected for systematic excavations in the future when funds and personnel are available. The relevant data obtained from the explorations of limestone areas and test excavations in areas other than Lipuun Point are sketched below.

### THE BALABAG CLIFFS

The Balabag Cliffs of the Ransang and Semerem watersheds (see Fig. 2), some 90 kilometers by water south of Quezon and a day's hike into the interior, were explored for one week in 1963 with negative results. Only one recently used cave site was discovered. This small cave located high on the face of an almost sheer cliff contained the skeletal remains of two adults, an iron knife, a wooden bowl and spoon, and a ladder-like frame used in carrying the bodies to the cave. The Pala'wan guides recognized the materials as "modern," but stated that these items were no longer made. The use of this cave may be safely dated to the late 19th or early 20th century. Many large caves were visited but the caves were either wet or had rocky floors which were generally unsuitable for habitation or burial. However, it will be necessary to resurvey the Balabag Cliffs, for the limestone exposure is huge—three-hundred hectares or more—and may well contain prehistoric sites. At least one or two months of daily explorations would be necessary to achieve an effective survey.

This area is of considerable interest anthropologically. During a few months of each year, local Pala'wan families live in the mouth of the Great Cave in the Balabag Cliffs, as well as in nearby rock-shelters. The people establish residence in the Great Cave in order to catch the tens-of-thousands of small edible bats which leave the cave in clouds just prior to sunset. The bats are impaled by a device which consists of a long bamboo pole at the end of which are tied many thorny lengths of rattan. The pole is simply whipped back and forth in the air impaling the bats as they fly out of the

cave. Pleistocene Man in Palawan, as noted, also used bats extensively for food. The Pala'wan in the area of the Balabag Cliffs may also flee to the caves during periods of intense thunder of which they have great fear. Neolithic stone tools which have been accidentally found by the Pala'wan are called, in fact, *ngipe't duldug* or "thunder teeth."

During an earlier aerial survey of this area when the Great Cave in the Balabag Cliffs was first seen—an aerial survey made possible through the cooperation of Mr. Lee German, pilot-missionary with the New Tribes Mission—possible cave sites were also seen at the towering Pagoda Cliffs near the headwaters of the Panalingaan River in southern Palawan. This area has not been explored from the ground.

### THE KALATAGBAK AREA

Ten caves and rock shelters in the rugged limestone exposures of the Kalatagbak area (Fig. 5) were found to contain surface artifacts. The artifacts found in the Kalatagbak caves range in age from edge-ground Neolithic tools to burial and habitation sites associated with monochrome trade potteries, probably Yüan, of Chinese origin. Caves here and in the Tumarbong area were also inhabited for brief intervals during the last war by the local Pala'wan population, specifically when there were rumors of approaching Japanese soldiers, and may be disturbed as a result of these activities. The Kalatagbak area is approximately one day's hike from the National Museum's Field Station at Quezon. The area was first explored by Mr. Angel Espeleta who worked briefly with the field team, and later by the writer and Mr. David Viola of the University of the Philippines.

Brief test excavations were made in two rock shelters at Kalatagbak—Sasak and Ulo. The shallow deposits in Sasak Rock Shelter were apparently stratified, yielding highly decorated Metal Age pottery in the lower levels and sherds of Chinese trade pottery near the surface. The sherds of the Metal Age pottery from Sasak are notably different from the pottery types of the Tabon Caves, although there are relationships. The most frequent design found on the shoulders of the smaller vessels from Sasak Cave, including angle-bodied forms, is a "Sloping-S" pattern (see Fig. 50). This distinctive design has been encountered to date in only one site on Lipuun Point—Pawikan Ledge. Design patterns made with an *Arca* shell are also found on the shoulders of small vessels from Sasak Rock Shelter. Corner points are notched or scalloped. A recurring

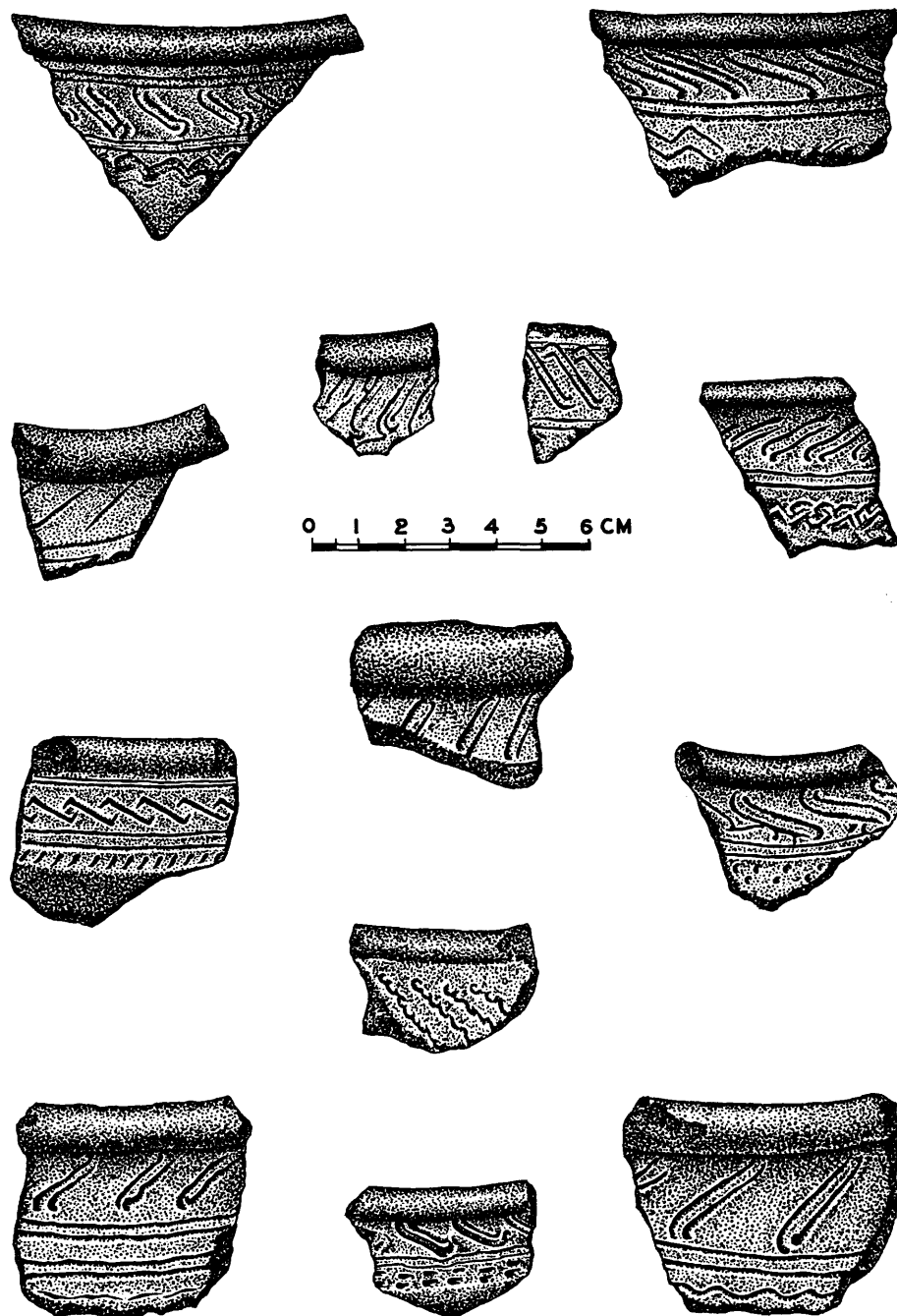


Fig. 50. Sasak Rock Shelter: rimsherds showing "Sloping-S" Designs.

design pattern features punctuations combined with incised lines or bands. Cord marking is present.

A few glass beads and iron fragments recovered with the decorated sherds indicate that the one level of cultural materials in Sasak Rock Shelter falls into the Metal Age. It is presently believed that this rock shelter was used during the Developed Metal Age and generally after the principal period of jar burial in the Tabon Caves, approximately 400 A.D. to 600 A.D. A more precise statement as to the chronological position of this site will not be possible, however, until systematic excavations have been made in this site.

#### THE KURUSWANAN AREA

Only one day's exploration in this area, which may be reached from the coast by following either the Isugod or Iwaig Rivers (Fig. 5), disclosed three caves sites. Two of these sites contained coffin burials, the first burials of this type to be reported from Palawan Island. The two coffin sites had been discovered nearly thirty years earlier by the present inhabitants of the Pala'wan village of Mara'may who had formerly lived in and farmed the Kuruswanan valley. There were no people living at Kuruswanan in 1963-64. It will be necessary to systematically re-explore the extensive limestone outcroppings at Kuruswanan.

*Lungun Cave.*—One log-coffin was found in this large, multi-chambered cave. The local Pala'wan name for this cave, *lungun*, means "coffin." The coffin had been cleverly hidden in an inaccessible interior chamber near a high opening which overlooked a small stream passing beneath a limestone bridge; a truly magnificent setting for a burial.

The coffin is made from the trunk of an extremely hard wood tree, *ipil* (*Intsia biyuga*), and is 115 cm. long and 32 cm. wide. Holes in the flanges at the ends of the body and cover had apparently held wooden pegs to pin the two parts together (Fig. 51). Although the cover had been removed and a few bones scattered on the nearby rocky surface of the cave, the contents of the coffin had not been badly disturbed.

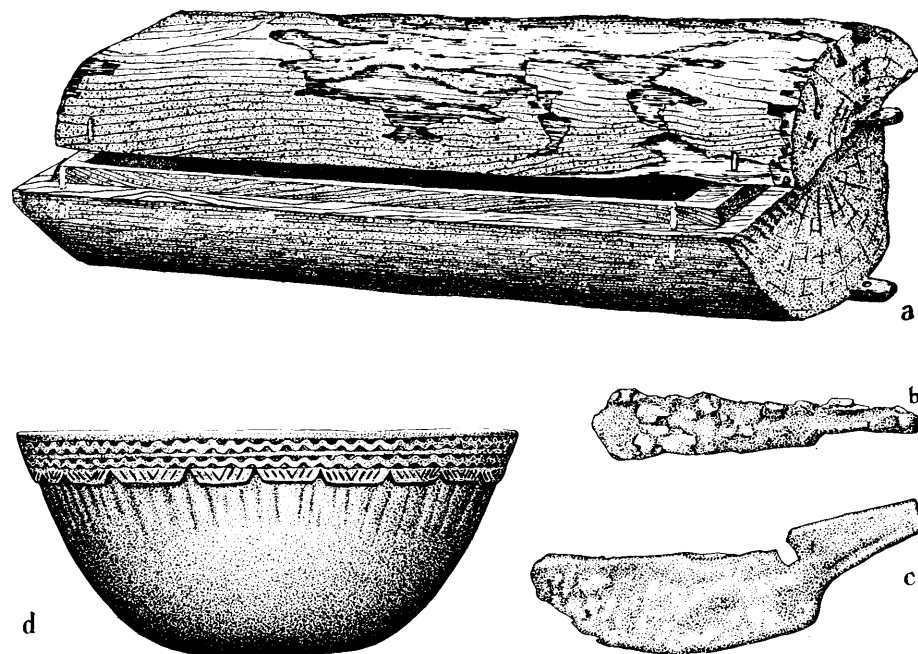


Fig. 51. Lungun Cave: (a) Log Coffin for secondary burial (x 1/5 natural size); (b and c) knives from the coffin; and (d) Decorated vessel believed to be associated with the coffin.

The small coffin contained the bones of two individuals — a young adult and a juvenile—being an example of a multiple, secondary burial. It also contained one fragment of a thin plain pottery, a rice knife of a type which is still used in Palawan, a small knife of a type which is also used at present for cutting betel, and a part of a spear with a tang (Fig. 51).

One decorated earthenware vessel (Fig. 51-d) was found in the same cave near the mouth of the chamber which led to the coffin. As no other cultural materials were encountered on the surface of the numerous chambers in this cave, it is probable that the coffin and the earthenware vessel are associated. The characteristics of this vessel do not show relationships with the earlier Tabon Pottery Complex.

Although the associated tools and weapons are modern in type, no proto-historic trade pottery was found in Lungun Cave, and the coffin burial is tentatively dated to the last phase of the Developed Metal Age, about 700 A.D. to 1000 A.D., just prior to trade with China.

*Kuruswanan Ledge.*—The second coffin burial was found in a nearby limestone outcropping. It had been placed at the end of a narrow ledge high on the face of a sheer cliff. An overhang above this ledge protected the coffin from the elements. The form of this coffin (Fig. 52) bears no relationship to the coffin found in

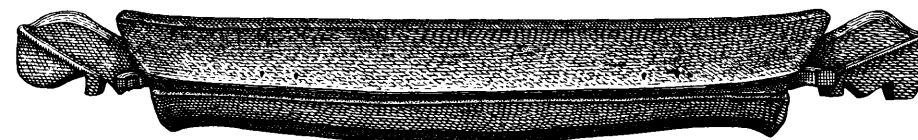


Fig. 52. Kuruswanan Ledge: Boat Coffin for Primary Burial.

Lungun Cave, being beautifully carved and resembling the form of a boat. It was described by the guides who had seen it many years before as a *banka* or "boat." Holes along the sides of the cover and the body of the coffin were used to peg or tie them together. The coffin measures 224 cm. in overall length, 37 cm. in width, and was also made of the hard wood *ipil* (*Intsia bijuga*). A few bones of a young adult were found on the ledge next to the coffin. These and the size of the coffin would indicate that it had been used for the primary burial of a single individual.

Sherds of a brown-glazed stoneware jar of Chinese origin and probably Yüan, late 13th or early 14th century A.D. in date, were found next to the coffin. Elsewhere in the Philippines coffins found in caves are invariably associated with Chinese trade pottery, dating after the 12th century A.D. Coffin burials of the Metal Age and Proto-Historic period are common in the Islands, but the archaeologists of the National Museum have not encountered Stone Age coffin burials. At Niah, however, a tree trunk coffin yielded a C-14 date of  $2,460 \pm 70$  years before the present, well into the Late Neolithic [Solheim, Harisson, and Wall (1959) 168], and Late Neolithic coffin burials will probably be found in the Philippines as earlier noted.

*Cave Sites in the Quezon Area of the Proto-Historic Period.* — Trade pottery from South China of the Sung and Yüan Dynasties has

been found in a number of caves and rock shelters in the Kalatagbak, Iwaig, Taglumot, and Tumarbung areas, as well as in two caves on Lipuun Point. Only preliminary work has done in these proto-historic cave sites, but striking changes in the associated cultural materials as well as in the forms and decorations of the earthenware potteries may be seen.

A small earthenware jar, decorated on the shoulder, was found behind a nest of rocks on a shelf near the base of Magmisi Mountain (Fig. 53). The bones of an adult also found on this shelf indicated that the jar was used for secondary burial, and the associated Chinese sherds of the Sung Dynasty date this site as 11th or 12th century A.D.

In Bubulungun I Cave, Lipuun Point, sherds of six restorable plates and four jars of Chinese origin were found scattered on the surface and in the sub-surface level of Chamber B. The pieces are not later than Sung in date and possibly "Early" Sung. The shallow deposits of this chamber had been badly disturbed and contained artifacts associated with jar burial of the Metal Age, possibly earlier. It was not possible to establish with certainty the cultural materials which were associated with the trade wares. It is significant, nevertheless, that a diagnostic type of bead was found only in Chamber B which also contained the Sung porcelains and stonewares. Dr. Juan R. Francisco, Institute of Asian Studies, University of the Philippines, has identified this type of bead as "Indo-Roman," and as being made in South India under Roman supervision (Color Plate I-B:v and w). The span of the Roman occupation of South India was approximately "...from the close

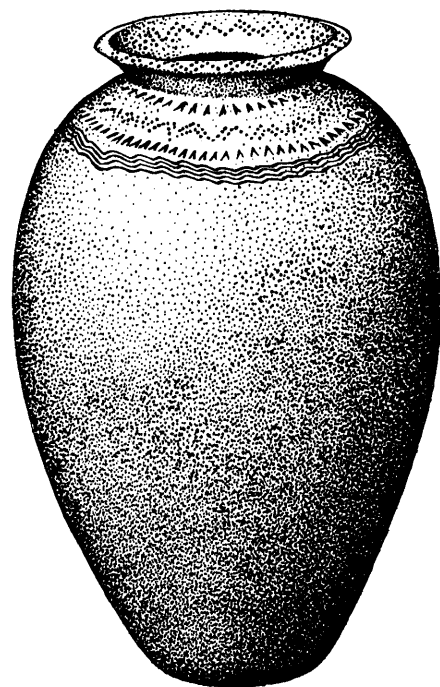


Fig. 53. Magmisi Shelf: Earthenware jar associated with Chinese trade pottery of the Sung Dynasty.

of the first century B.C. to A.D. 200" [Sharma (1953 165)]. These diagnostic beads would seem to have appeared in Palawan, however, at a much later date; not until after the beginning of formal trade with China.

Numerous other caves and rock shelters associated with Yüan and Sung monochrome trade potteries of Chinese origin have been found in the Quezon area, but no excavation have been made in these sites. Based upon the archaeological data available at present, there would appear to be a "Ming Gap" in the caves on the central west coast of Palawan Island as in Borneo (Harrison 1958), for no cave has been found which contains the typical early Ming porcelains and stonewares from China or the 14th and 15th century wares from Thailand and Annam (Indo-China).

The use of caves for burial purposes appears to have faded out in the Quezon area by the late 14th century A.D., in favor of interment in open burial sites. Open burial sites which contain Ming trade pottery and burials in stoneware jars are common on the east coast of Palawan Island, being revealed by the more extensive agricultural activities along the east coast. It is certain that similar cemeteries of this period will be found on the west coast.

*Stoneware Jars.*—An extensive trade of stoneware jars made in South China continued into Palawan to the Spanish Period.

A large collection of these heirloom jars, mostly Early Ch'ing, late 17th century and 18th century in date, but including a few Ming pieces, was purchased by the writer for the National Museum from the local Pala'wan, now Protestants, who had formerly used them in rice wine rituals (Plate XVII).

#### THE EL NIDO AREA

During the period from October 16 to November 30, 1965, the writer and a field team made an initial exploration of the El Nido area on the northwestern coast of Palawan, some 250 kilometers from Quezon. The exploration and excavations in the El Nido area and



Fig. 54. Modern earthenware vessel made by Pala'wan of Quezon showing persistence of incised and impressed designs.

elsewhere in Palawan were supported, as noted, by a timely grant-in-aid from the *National Geographic Society*.

Reports of archaeological sites in the El Nido area, famous for the edible bird nests gathered there, had reached the writer for a number of years, but plans to visit El Nido were continually delayed by the excavations in the Tabon Caves and lack of funds. The El Nido area had been briefly explored in the 1920's by Dr. Carl Guthe, as discussed in the *Introduction*, and he recorded four cave sites. An aerial survey of the area was accomplished in March, 1964, when Brigadier General Jonas Victoria, then the Chief of Staff of the Philippine Air Force, furnished a DC-3 to a Museum party. Accompanying the flight were Mr. Avelino Legaspi of the National Museum, Mr. Hans Kasten, Capt. Robert Fisher, USAF, who acted as photographer for the flight, and Lt. (jg) Richard Johnson, USNR. Flying at low altitudes, they saw at least 200 large caves in the Calamian Islands north of Palawan, and in the Taytay and El Nido areas of Palawan. Later, in February, 1965, Lt. Johnson and his wife visited and photographed a few undisturbed caves in the El Nido Area which contained surface artifacts.

The initial Museum survey of the Bacquit Bay area at El Nido in 1965 yielded 18 cave sites, four of which had been previously visited by Dr. Carl Guthe and Lt. Richard Johnson. Six relatively small cave sites were completely excavated and test excavations made in two sites (Fox 1966c). The cultural assemblages range in date from Early Neolithic burials to the use of caves for burial in the 17th or 18th century A.D. Although not as rich archaeologically as the Quezon area and Lipuun Point, the initial period of exploration of El Nido shows that the area is of major archaeological importance. A new jar burial was discovered by the writer and Dr. Paul Zahl of the National Geographic Society when they visited El Nido in March, 1968, in order to photograph the caves and study the birds which build the edible nests. And, since that date, Mrs. Gloria Fernandez of El Nido, the Museum's Field Representative, has reported many new cave sites.

*Paredes Shelter*.—One small site, Paredes Shelter on Langen Island, was found to be stratified. The remains of three individuals which had apparently been wrapped in mats or shrouds—one male and two females—were discovered on the surface of this shelter. With the skeletal remains was a Chinese blue-and-white plate of the 18th (?) century, a plain earthenware cooking vessel, glass beads, a fragment of fabric, and knives made of iron. An identical assemblage of artifacts was found in three nearby grottos. All of the sites are late 17th century or 18th century A.D. in date.

Below this surface assemblage, in a rock filled deposit varying in depth from 50 cm. to 75 cm., a jar burial assemblage was encountered. Associated with this assemblage was a small, socketed bronze adze and one large jade bead. These materials show intimate relationships with the jar burial complex of the Tabon Caves. A few days before the boat from Quezon was to pick up the field team, another deeper level, about 80 cm. below the surface, was reached. This level contained three Neolithic burials; one supine and two flexed. All of the graves had pendants made from the tops of Cone Shells, and one grave yielded a *Tridacna* adze (Fig. 55). The types of burial and artifacts are identical to those found in the Neolithic grave of Duyong Cave which has a C-14 date of 2680 B.C.

*Leta Leta Cave*.—Twenty one days, October 27 through November 16, 1965, were spent in excavating this small, rich fissure on the east side of Langen Island, Bacquit Bay, El Nido. The cave was visited but not excavated by Dr. Carl Guthe and erroneously designated by Solheim (1964a) as an "Iron Age" site. The cave is actually a Late Neolithic burial site with polished stone tools and pottery. A thorough site report on Leta Leta Cave is in preparation and only brief remarks on the findings are included herein for comparison with the Late Neolithic burial sites of the Tabon Caves.

Leta Leta Cave is best described as a fissure-like shelter (Plt. XIV) with an extremely steep floor protected by an overhanging cliff (it was necessary to build platforms in order to work in the cave and screen the deposits). A small chamber was found at the upper end of the precipitous floor of the fissure. A great profusion of artifacts and human bones were encountered on small ledges along each side of the fissure and in the small chamber, including three perfect earthenware vessels. One of the earthenwares is a unique drinking vessel, the neck and lip of the vessel forming a human head and face with a yawning mouth (Fig. XVI). The presence of many stone and pottery artifacts on the surface of the cave suggest that there has been much erosion and exposure of sub-surface materials in the cave since visited by Dr. Guthe some 40 years before.

The excavations of Leta Leta Cave yielded a Late Neolithic assemblage of stone and shell artifacts in association with a sophisticated pottery. In addition to adzes-axes made of stone (two of nephite) and stone pendants, nearly 6000 stone and shell beads of many types were screened from the shallow deposits. Not a

single fragment of bronze, copper or iron was recovered, or beads of glass and carnelian which are found with Metal Age sites in the Philippines.

The cultural assemblage of Leta Leta Cave is without question Late Neolithic and probably represents an early phase of the Late Neolithic *circa* 1000 to 1500 B.C., or earlier. Manunggul Cave, Chamber A, at Quezon, a Late Neolithic site, has two associated C-14 dates of 890 B.C. and 710 B.C. The Leta Leta materials are certainly earlier than this, probably being of the same period as one undated cave in Quezon—Ngipe't Duldug Cave—which also has a generally similar assemblage of artifacts. However, Leta Leta Cave was not primarily a jar burial site, for only a few jars were found in the cave and these may not have been used for burial. Two other types of burials (possibly three) were revealed: (1) primary flexed burials, (2) "bundle" burials of bones painted with hematite, and (3) a burial in which the flexed remains were interred in a mound of hematite. The latter grave, however, may be much earlier in date than the Late Neolithic pottery and stone tool assemblage, being more likely related to the early Neolithic burials of Duyong Cave and Paredes Shelter.

The analyses of the pottery from Leta Leta has not been completed but it clearly shows affinity with the Tabon Pottery Complex and no relationships with the Kalanay Pottery Complex (see Footnote 5). There are also other Metal Age sites in the El Nido area, which contain jade ornaments and pottery intimately related to the Tabon Pottery Complex, including examples of cord marking and carved paddle impressions. Thus, the pottery of the Tabon Pottery Complex was present in northwestern Palawan during the Stone and Metal Ages.

*Other Cave Sites.*—Two caves were discovered on Kudugnun Point, Bacquit Bay, El Nido, which contained coffins, both caves dating it is estimated from the latest phase of the Developed Metal Age, *circa* 600 A.D. to 900 A.D. A number of other large and undisturbed jar burial caves were found which apparently date from the same period and earlier.

No Palaeolithic habitation sites were discovered, but a number of rock shelters with extensive middens of marine shells and fragments of pottery were encountered. Actually, the first period of exploration in El Nido covered only a fraction of the tremendous limestone outcroppings on the islands which dot Bacquit Bay and

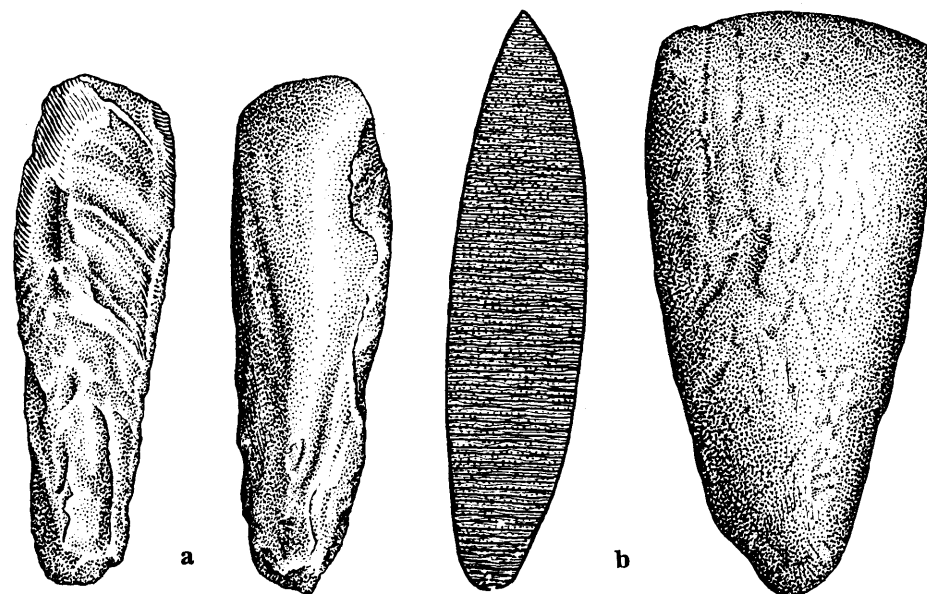


Fig. 55. Tridacna shell tools: (a) From Sanga Sanga Island, near Tawi Tawi, Sulu Archipelago; and (b) From Paredes Shelter, Langen Island, El Nido, Palawan.

the nearby mainland of Palawan. Limited time and transportation difficulties precluded even reaching caves which were reported by the bird nest collectors to contain jars.

There were also reliable reports of caves containing cultural materials in the Diwil and Taytay areas of northern and northeastern Palawan; and the islands of Coron, and Busuanga farther to the north are known to be rich in cave sites. The explorations and test excavations have thus revealed that within the Province of Palawan, including the Calamian Islands, there are many other limestone areas of major archaeological importance. It is truly a great and still pioneer area for prehistoric research.



## APPENDIX I

### DEATH, BONE WASHING, AND JAR BURIAL AMONG THE SULOD OF CENTRAL PANAY, PHILIPPINES

F. LANDA JOCANO

*University of the Philippines*

This report deals with the concept of death and the practice of bone washing and jar burial among the Sulod of Panay. Unless otherwise indicated, these data were observed by the writer doing fieldwork from 1955 to 1958 and from 1959 to 1960 among these people. During the period of study, the Sulod numbered from 800 to 1000 persons, living in the settlements of Maranat, Siya, Tangahin, Buri, and Takayan in the mountains of central Panay. The basis of their subsistence is shifting, dry agriculture called by them *kaingin*, supplemented with hunting, fishing and food gathering. Despite sporadic contacts with Christian lowlanders, Sulod lifeways have not undergone basic social and cultural changes in recent times. Social life is still characterized by superordination of kinship and by primary concern with socio-religious activities. And death, being the last rite of passage, is a major event in Sulod life surrounded by elaborate ritual prescriptions—bone washing and jar burial being among these.<sup>1</sup>

*Concept of Death.*—Bone washing and jar burial can be best appreciated by an understanding of the *rationale* which underlies these practices. The Sulod express their concept of death in a number of ways. A person may simply die of old age which is about the only manner of dying that is considered natural. Although most deaths are attributed to the workings of the spirits, the Sulod also recognize those which are not caused by them, like "poisoning," "sorcery," or a "killing" which was the result of a fight caused by personal conflict. A man also dies if the *aswang* (witch) "eats his liver." Regardless of the manners in which it occurs, a man's death is prescribed for him at birth.

In Sulod mythology, there are three brothers who determine death and the manner of dying. They are Mangganghaw, Manlugas, and Patagos. Mangganghaw is charged with accounting for newborn babies and reporting them to his brother, Manlugas. The latter verifies the report noting, among other things, whether a child is

<sup>1</sup> See F. Landa Jocano, *SULOD SOCIETY: A Study in the Kinship System and Social Organization of A Mountain People of Central Panay* (Quezon City, University of the Philippines Press: 1968).

born alive or dead. This done, he returns home and reports to his brother, Patagos. Patagos is the one who makes the infant select the type of death which it wants and the manner of dying. The choice that the child makes and the agreement reached is sealed by Patagos with his "measuring stick." This determines the life span of the child.

Sociologically, this myth provides the Sulod with a theoretical frame of reference which enables him to grasp the often subtle relationship between his basic religious beliefs and the modes of his everyday expressions. It gives meaning to events which takes place around him, and serves as an instrument by which convictions are renewed and strengthened. It likewise expresses to him the nature of life and death and the universe in which he lives. Thus, the phenomenon of death ceases to be mystery to him, because he knows what looms ahead after death, where the soul goes immediately upon leaving the body, and what happens to it. This awareness finds expression in the rituals associated with death and burial.

Because death is set for the individual at birth by supernatural beings, it is necessary that these supernatural beings be propitiated so that they will not harm the soul as the latter travels from the land of the living to the region of the dead. In this setting, it becomes understandable why death and burial is surrounded by many diverse beliefs and practices, ranging from specific prescription concerning the corpse to elaborate rituals for the supernaturals.

*Preparing for burial.*—As soon as a person dies, the corpse is washed. A clean piece of cloth is wound around its chin and the two ends are tied on top of the crown of the head. This is called *bogkos*. (see figures in *Color Frontispiece*). A raised platform, *pipig*, is built near one corner of the one-room house. Then the corpse is laid on this platform, its head raised by using two or three pillows. A bambo wall is built around the platform so that visitors do not see the corpse when entering the house. This is to protect the members of the family from *mabugnuhan* (meaning "to ask unknowingly") which might lead to the unintentional breaking of a taboo known as *pamalihon*.

The corpse is next treated with *kamangyan*, a native incense, mixed with husks of rice placed inside of a coconut shell. Several tubers of ginger and *kalawag* are also obtained and pounded. The juice of the latter are strained, and the liquid placed on a ceremonial plate. The entire body of the dead is then rubbed with this liquid. This ceremony is called *burul*. The *kamangyan* gives the

corpse a pungent odor, especially after it has been anointed with *kalawag*. It is believed by the Sulod that such odor will prevent the evil spirits from coming to feast on the "insides" of the dead man, and the corpse will not rot before burial which usually takes place three days after death. This three-day period is observed in order to allow all of the relatives of the dead to gather for the funeral. The ginger makes the skin tough while the *kalawag* removes the "color of the dead" from the limbs, hands, and face of the corpse, thus, making it look like a person asleep.

After the *burul* has been completed, the corpse is dressed with the best attire which the individual had during life. The Sulod believe that the soul continues to enjoy a mortal-like existence in the afterlife; hence, if the soul should go on a journey, it must be well attired in about the same manner that the living dress when they go to market or attend parties. The ornaments of the corpse include bracelets, earrings, spears, knives, and ritual plates. Thus Umbu Paaw, as most Sulod I know testified, came back to life after having been dead for three hours, and requested her eldest daughter to readjust her dress because it was put on her inside out (*baliskad*), and she was embarrassed before the other souls in Madyaas. And later, when she returned to continue her journey to the land of the dead, she could no longer find her way as the door through which she had previously passed was closed.

The night following the death of a person, the *pukaw* ceremony is held. The *pukaw* is performed in order to strengthen the soul physically before it starts on its journey to Madyaas, the "land of the dead." The Sulod generally believed that the struggle which the dying undergoes, in trying to prevent the soul from leaving the body, drains the body of its energy. In like manner, the weeping and the crying during the *hinaya* (dirge) burdens the soul with extreme sadness. Hence, a ceremony is designed in order to enable the soul to withstand the strain of travel from the land of the living to that of the dead.

During the *pukaw*, the efficient who is generally a female *baylan* or "medium" sits in the middle of the room. A seat is prepared for her near the improvised ceremonial altar. The offering or *halad* consists of a boiled whole chicken placed on a bamboo tray covered with a banana leaf, around which are placed seven handfuls of rice and seven slices of egg. As soon as everything is prepared, the *baylan* cautions the crowd to keep silent. She faces the *halad*, picks up a bamboo node called *tibungbung*, and invokes

the deified souls of all of the ancestral dead. This ceremony normally lasts for about two hours.

The second phase of the ritual is called *hinaya*. This is performed the following morning. All the relatives of the dead gather around the corpse and weep. The past activities of the dead are now recalled and everyone wails his/her farewell. The women cover themselves with pieces of black cloth. No one is allowed to make noise during this ceremony, and whoever violates the prohibition is severely punished.

The night following the *hinaya*, another ceremony called *tubung* is performed. The medium sits near the corpse and swings over its face a necklace of vari-colored seeds which had been charmed for the occasion. As she does this, she invokes the souls of departed relatives. After these have been invoked, the *baylan*, in a loud voice, calls the *patibara*.

The *patibara* is performed to find out what or who caused the death of the person. During the ceremony the *baylan* goes into a trance and the relatives of the dead may converse with the *umalagad*. It is through this ceremony that the actual cause of death becomes known and if it were due to either witchcraft or sorcery, who is the logical suspect.

After the *patibara*, the *hamwat* is performed. Another platform is built close to one corner of the house. Used as an altar, this construction consists of two parts: (1) a higher portion upon which is placed the food offering for *Dagit*, the spirit of the space and his followers; and (2) a lower portion on which is placed the offering for *Punay*, a powerful female deity of the mountains and her companions. *Dagit* and *Punay* normally give each soul a "talisman" (those that I saw looked like tektites and polished stone tool) to protect the soul from melting while waiting for the final decision and assignment to the land of the dead.

The Sulod believe that if the *hamwat* ceremony is not performed, the soul of the dead will be placed inside the big dipper. Then, the soul will be transferred by the supernaturals from one jar to another, and each time that this is done, the soul will leave part of its body in the jar. When, on the contrary, the *hamwat* is performed, *Sabug* or the guardian-messenger of the souls appears and takes the soul to the land of the living to attend the ceremony. *Mulang*, the wife of *Sabug*, watches over these souls. When the souls are under the care of *Mulang* they are specifically called *turubusun*.

The *hamwat* ceremony lasts from midnight until about mid-morning of the next day. During the performance of this ritual, the *baylan* falls into a trance several times and each time she is "possessed," all the windows and doors of the house are closed. She calls for the soul:

Come back O beloved  
Come back O dear one  
Please come back home for a while  
Return from where you come  
Back with your parents  
And have your body made whole  
Strengthen yourself for the journey.

This ceremony is followed by the *tuntun* or the carrying of the dead to the place of burial.

*Carrying the corpse to the grave.*—In carrying the corpse to the grave, certain steps must be carefully followed. The coffin is lifted and brought down, not through the door, but through a window or an opening made in the wall of the house. The Sulod believe that bringing out the dead through the door would bring another death to the family, the door being the main opening in the house through which each member passes. When the corpse is passed through the window or wall-opening, the nearest kin, if the widow/widower is too distraught to do the task, pours water after it. This is to wash away the "contagious smell" of the dead. If this is not done, one of the members of the bereaved family will soon follow the dead to the grave.

#### TYPES OF BURIAL

*Open burial.*—If an important person in the community, the dead is not usually buried in the ground. A coffin is prepared by chopping down a large tree, cutting it to a convenient length, shaping it like a boat, and then hollowing it out. Carvings are made on the cover and sides. The corpse is placed inside the coffin and the cover and body of the coffin are sealed together with almaciga gum. Then the coffin is placed in a special shed made of cogon shingles, called *kantang*, which is built on top of a solitary hill. Finally, a hole is bored in the bottom of one end of the coffin and a small bambo tube called *pasuk* inserted to facilitate the flow of the decomposing body fluids. The body is left on the top of the hill for three or more months. This practice is not popular today with the younger generation.

*Tree trunk burial.*—Another form of burying an important individual is to hollow out a large tree, usually one which grew up at the same time as the person who died. The hollow is normally prepared beforehand; that is, while the deceased was seriously ill. If the individual does not die during the process, the job is discontinued. If he does, then the hollow tree serves as his grave. The body is wrapped with a mat and is deposited into the tree trunk in a standing position. The slits are sealed with almaciga gum superimposed by wax derived from the honeycombs of wild bees. A hole is chiseled at the bottom of the hollow to allow the decomposing body fluids to flow out. The corpse is left inside the trunk for about a year, then the bones are removed and washed.

*Underground burial.*—Among the younger Sulod, especially those living in the lower sections of the Panay River, burial in the ground is popular. A group of nine men proceed to a hillside in the morning following the death of a kin. There, they dig a hole normally about four to five feet deep. In selecting the site for the grave, the elder member of the team sees to it that the place is dry and hard. The dead man's nearest kin breaks the ground for the grave before the other men can dig.

Upon reaching the burial place, the kinsmen carrying the coffin place it near the prepared hole. Then the oldest man in the group steps forward and scrapes a handful of earth from the pile nearest the edge of the grave; the rest follow him. Then they throw the handfuls of earth into the hole, as the old man speaks loudly:

If there is bad luck in store for those who are left behind, warn us, O tell us, *tagwati*, with the long tail, as we cover this grave.

The *tagwati* is one of the Sulod omen birds. When a Sulod hears this bird sing, not even the most persuasive plea can induce him to proceed on his journey or even temporarily to leave his house. They say that the *tagwati* is the guardian of the souls which notify the living of misfortunes ahead. Thus, the *tagwati* is called upon to indicate the future of the bereaved family. They believe that if the earth filled in the grave is more than the amount excavated when the grave was dug (that is, more than the expected mound after the coffin has been lowered and everyone had stepped over it), then no one in the family will die. But if the earth is less and there is *alopyak* or a sort of a caved in portion, then it is certain that someone in the family will soon die. Hence, before lowering the coffin, the Sulod consult the *tagwati* to foretell the

future. If the *tagwati* sings an unfavorable song, the Sulod dig another grave elsewhere.

The Sulod believe that death and sickness are sometimes caused by burying a kinsmen in the wrong place. It is the consensus among them that if the burial ground is infected with earthworms or if it is muddy, then the dead would be uncomfortable. And, the soul in the land of the dead but still guarding over its former body, would punish the negligent with sickness and eventually death.

Should the dead be placed in the *kantang* or coffin left in a small structure, instead of being buried in the ground or a tree trunk, the members of the household will take turns in visiting the body until only the bones remain. During these visits, the dead person is invited to eat offerings of food frequently left beside the corpse.

*Bone washing.*—As soon as the flesh of the dead has decomposed, the bones are exhumed (if buried in the ground or in a tree trunk) or gathered (in case of an open burial) and finally washed. A special ceremony is held on this occasion, and a *baylan* called to officiate in the ritual washing which normally starts early in the evening and ends the following morning. The bones are first removed from the platform where they had been placed during the ritual and then carried to a river where they are washed. The Sulod believe that the souls of the dead come down from the land of the dead to that of the living by means of a river. Hence, washing the bones in the river makes it easier for the soul to identify its own remains and to put charms on them. The finger and toe bones are washed first; then the limbs (tibia, fibula, patella, femur, ulna, radius, and humerus). The hip bones, spinal cord, the ribs, scapula, and clavicle are washed next, and finally the skull.

After all the bones have been washed, they are brought back to the house. Another ritual is performed at the house before placing the bones on a ritual platform to dry. An elder member of the deceased's family, or the widow/widower, secures a wide piece of black cloth and gives it to the medium. The medium walks around the bone several time, praying in murmurs as she incenses the bones. The bones are then wrapped in this black cloth and hung under the eaves of the house as a "guardian spirit." The charms which the soul has placed in the bones keep evil spirits away. Sometimes the bones are placed inside a trunk or a bamboo basket.

Then, the container is tied to a beam of the house or secured to a construction built beneath the roof.

*Jar burial.*—The bones of the dead are tended with great care. They are kept wrapped in black cloth and intact until the first anniversary of the bone washing ceremony. However, if someone becomes ill before this date, the bones are removed and placed inside an ancient stoneware jar. The Sulod believe that sickness is an indication that the charms placed on the bones by the soul of the departed are no longer powerful. This means that the soul wants the bones to be kept "in peace." During the transfer of the bones to the jar still another ritual is performed, souls of ancestors being called to participate in this ceremony and "...to be witnesses to the fact that the living are taking care of the remains of their departed kin." The jar is then placed either on a platform constructed for it directly beneath the center of the roof or under the house and covered with a large bamboo basket.

The oldest daughter or the eldest son of the deceased takes care of the jar. It does not leave their possession until one of their sibling dies in which case the jar is passed to the latter's family. It must be pointed out that the jar is not buried until the bones of all of a sibling group have been placed in the jar. The jar is normally buried beneath the house. Some informants say that in olden times caves and ravines were used as burial sites. I have no case studies to indicate that this has been practiced by the Sulod in recent years.

## REFERENCES

**Berger, Rainer, and W. F. Libby**

- 1966 "UCLA Radiocarbon Dates V," *Radiocarbon*, Vol. VIII, pp. 467-497.

**Bernardo, Angelo and David Viola**

- 1965 "Diwata Cave Pottery Analysis," a typescript prepared during the Field Project of the Summer Institute at Quezon, Palawan, in 1965, sponsored jointly by the Department of Anthropology, University of the Philippines, and the Division of Anthropology, National Museum.

**Beyer, H. Otley**

- 1947 "Outline Review of Philippine Archaeology by Islands and Provinces," *Philippine Journal of Science*, Vol. 77, Nos. 3-4 (July-December) Manila.
- 1948a "Philippine and East Asian Archaeology, and Its Relation to the Origin of the Pacific Islands Population," *Bulletin No. 29, National Research Council of the Philippines*, Quezon City.
- 1948b "Early History of Philippine Relations with Foreign Countries, Especially China," in E. Arsenio Manuel's *Chinese Elements in the Tagalog Language* (Manila: Filipiniana Publication).
- 1949 *Supplementary Illustrations* to the "Outline Review of Philippine Archaeology by Islands and Provinces," (November), Manila.

**Casiño, Eric**

- 1965 "Legends About the Caves of Lipuun Point, Palawan," *Sunday Times Magazine* (March 14), Manila.

**Chang, Kwang-chih**

- 1958 "New Light on Early Man in China," *Asia Perspectives*, Vol. II, No. 2 (Winter).
- 1962 "Major Problems in the Culture-History of Southeast Asia," *Bulletin of the Institute of Ethnology Academia Sinica*, No. 13 (Spring).

**Chen, Chi-Lu**

- 1962 "Woodcarving of the Paiwan Group of Taiwan and Its Affinities," *International Association of Historians of Asia*:

*Second Biennial Conference Proceedings*, (October 6-9, 1962), held at Taiwan Provincial Museum, Taipei, Republic of China.

**Childe, V. Gordon**

- 1953 "Old World Prehistory: Neolithic," *Anthropology Today: An Encyclopedic Inventory* (Chicago: The University of Chicago Press).

**Coon, Carleton S.**

- 1963 *The Origin of Races* (New York: Alfred A. Knopf).

**Cornwall, I. W.**

- 1956 *Bones for the Archaeologist* (New York: The MacMillan Company).

**Crane, N.R. and James B. Griffin**

- 1959 "University of Michigan Radiocarbon Dates IV," *American Journal of Science Radio Carbon Supplements*.

**de Heinzelin, J.**

- 1963 "Observations on the Absolute Chronology of The Upper Pleistocene," in *African Ecology and Human Evolution*, edited by F. Clark Howell and Francois Bourliere (New York: Wennen-Gren Foundation for Anthropological Research, Inc.).

**Dickerson, Roy E.**

- 1928 *Distribution of Life in the Philippines*, Monograph 21, Bureau of Science, Manila.

**Evangelista, Alfredo E.**

- 1960 "Philippines," *Asia Perspectives*, Vol. IV, Nos. 1-2, (Summer-Winter).  
 1962 "Philippine Archaeology Up to 1950," *Science Review*, National Science Development Board, (September), Manila.  
 1963 "Philippines," *Asian Perspectives*, Vol. VII, Nos. 1-2, (Summer-Winter).  
 1966 "The Incipient and Emergent Periods in Philippine Culture-History," *Filipino Cultural Heritage, Lecture Series No. 1: Prehistoric Cultures*, The Philippine Women's University.  
 1967 "H. O. Beyer's Neolithic in the Context of Postwar Discoveries in Local Archaeology," *Studies in Philippine An-*

*thropology (In Honor of H. Otley Beyer)*, edited by Mario D. Zamora (Quezon City: Phoenix Press, Inc.)

**Fairbridge, Rhodes W.**

- 1960 "The Changing Level of the Sea," *Scientific American* (May).  
 1962 "World Sea-Level and Climatic Changes," (Xerox Copy).

**Ferguson, G. J. and W. F. Libby**

- 1963 *UCLA Radiocarbon Dates III*, Institute of Geophysics, University of California, Los Angeles 24, California. Mimeo.

**Finn, Daniel J.**

- 1958 *Archaeological Finds on Lamma Island* (Ricci Publication: University of Hongkong).

**Flint, Richard F.**

- 1953 *Glacial Geology and the Pleistocene Epoch* (New York: John and Wiley & Sons, Inc.).

**Fox, Robert B.**

- 1952 "The Pinatubo Negritos: Their Useful Plants and Material Culture," *The Philippine Journal of Science*, Vol. 81, Nos. 3-4, (Sept.-Dec.).  
 1954 "Religion and Society Among the Tagbanwa of Palawan Island, Philippines," Ph. D. Dissertation, University of Chicago.  
 1957 "A Consideration of Theories Concerning Possible Affiliations of Mindanao Cultures With Borneo, the Celebes, and the Regions of the Philippines," *Philippine Sociological Review*, Vol. V, No. 1 (January).  
 1959a *The Philippines in the Prehistoric Times*, UNESCO National Commission of the Philippines, Manila.  
 1959b "The Calatagan Excavations: Two Fifteenth Century Burial Sites in Batangas, Philippines," *Philippine Studies*, Vol. 7, No. 3 (August), Manila  
 1962 "First Progress Report of Excavations in the Alfonso XIII Cave, Palawan," prepared for the *National Science Development Board*. Mimeo.  
 1963 "Ancient Man in Palawan: A Progress Report of Current Excavations," prepared for the *National Science Development Board*. Mimeo.  
 1965a "Cave Treasures of Ancient Asia," *The Asia Magazine* (June). 6.

**Fox, Robert B.**

- 1966 "First Progress Report to the National Geographic Society on the Explorations and Excavations of Cave Sites of Ancient Man on Palawan Island, Philippines (September 24 to December 4, 1965). Mimeo.
- 1967 "Excavations in the Tabon Caves and Some Problems in Philippine Chronology," *Studies in Philippine Archaeology (In Honor of H. Otley Beyer)*, edited by Mario D. Zamora (Quezon City: Phoenix Press, Inc.).
- 1968 "The Prehistoric Foundations of Contemporary Filipino Culture," *Solidarity*, Vol. III, No. 2, (February). Manila.

**Fox, Robert B. and Alfredo Evangelista**

- 1957a "The Bato Caves, Sorsogon Province, Philippines," *University of Manila Journal of East Asiatic Studies*, Vol. VI, No. 1 (January).
- 1957b "The Cave Archaeology of Cagraray Island, Albay Province, Philippines," *University of Manila Journal of East Asiatic Studies*, Vol. VI, No. 1 (January).

**Harrison, Tom**

- 1957 "The Great Cave of Niah: A Preliminary Report on Bornean Prehistory," *Man*, Vol. LVIII, Articles 211-226 (November).
- 1958 "The Ming Gap and Kota Batu, Brunei," *The Sarawak Museum Journal*, Vol. VIII, No. 11 (June).
- 1959 "New Archaeological and Ethnological Results from Niah Caves, Sarawak," *Man*, Vol. LIX, Articles 1-22 (January).
- 1962 "Borneo Death," *Bijdragen tot de Taal-, Land-, en Volkenkunde*, Deel 118.
- 1964 "100,000 Years of Stone Age Culture in Borneo," *Journal of the Royal Society of Arts* (February).

**Harrison, Tom and Lord Medway**

- 1962 "A First Classification of Prehistoric Bone and Tooth Artifacts (based on materials from Niah Great Cave)," *The Sarawak Museum Journal*, Vol. X, Nos. 19-20 (July-December).

**Heekeren, H. R. Van**

- 1956 "Note on a Proto Historic Urn-Burial Site at Anjar, Java," *Anthropus*, Vol. 51, 194-200.

**Heine-Geldern, Robert**

- 1932 "Urheimat und Fruheste Wanderungen der Austronesier," *Anthropus*, Vol. 27, Nos. 3-4 (May-August).
- 1945 "Prehistoric Research in the Netherland Indies," *Science and Scientists in the Netherland Indies* (New York).

**Heizer, Robert F.**

- 1959 Discussion on July 8, 1959, Afternoon Session, on the "The Application of Quantitative Methods in Archaeology," Viking Fund Publications Number Twenty-Eighth (New York).

**Janse, Olov R. T.**

- 1959 "Some Notes on the Sa-huynh Complex," *Asian Perspectives*, Vol. III, No. 2 (Winter).

**Jocano, F. Landa**

- 1965 "Rethinking Filipino Cultural Heritage" (Ms.)

**Kano, Tadao**

- 1952 Studies in the *Ethnology and Prehistory of Southeast Asia*, 2 volumes, (Tokyo: Yajima Shobo and Co.). Text in Japanese.

**Koenigswald, G. H. R. Von**

- 1958 "Preliminary Report on a Newly-Discovered Stone Age Culture From Northern Luzon, Philippines," *Asian Perspectives*, Vol. II, No. 2 (winter).

**Kokubu, Naoichi**

- 1956 "Note on the Burial Customs in Prehistoric Formosa," *Proceedings of the Fourth Far-Eastern Prehistory and the Anthropology Division of the Eighth Pacific Science Congresses Combined*. Published by the National Research Council of the Philippines, University of the Philippines, Quezon City.

**Kokubu, Naoichi and Erika Kaneko**

- 1962 "Ryukyo Survey, 1960," *Asian Perspectives*, Vol. VI, Nos. 1-2 (Summer-Winter).

**Leakey, L. S. B.**

- 1960 *Adam's Ancestors* (New York: Haraek Torchbooks).



**Lin, C. C.**

- 1963 "Geology and Ecology of Taiwan Prehistory," *Asian Perspectives*, Vol. VII, Nos. 1-2 (Summer-Winter).

**Mabuchi, Teichi**

- 1956 "Some Oral Traditions Relating to Urn-Burial in Formosa," *Proceedings of the Fourth Far-Eastern Prehistory and Anthropology Division of the Eighth Pacific Science Congresses Combined*, Part I (Second Fascicle: Section 1) pp. 319-328.

**Maglioni, Raphael**

- 1952 "Archaeology in South China," *The University of Manila Journal of East Asiatic Studies*, Vol. II, No. 1 (October).

**Malleret, Louis**

- 1959—Quelques Poteries de Sa-huynh dans leurs Rapports avec Divers Sites du Sud-East de L'Asie," *Asian Perspectives*, Vol. III, No. 2 (Winter).

**Manuel, E. Arsenio**

- 1953 "Inform Sobre Las Islas Batanes," *Philippine Social Science and Humanities Review*, Vol. 18.

**McCarthy, Fredrick D.**

- 1961 "Report on Australia and Melanesia," *Asian Perspectives*, Vol. V, No. 2 (Winter).

**Mori, Teijero**

- 1956 "Archaeological Study of Jar Burial in Neolithic Japan," *Proceedings of the Eighth Pacific Science Congress and the Fourth Far Eastern Prehistory Congress*, Part I Second Fascicle: Section 1, Queon City.

**Movius, Hallam L. Jr.**

- 1948 "The Lower Palaeolithic Cultures of Southern and Eastern Asia," *Transactions of the American Philosophical Society*, Vol. 38, Part 4.  
1958 "Editorial Comment," *Asian Perspectives*, Vol. II, No. 2 (Winter).  
1960 "Radiocarbon Dates and Upper Palaeolithic Archaeology in Central and Western Europe," *Current Anthropology*, Vol. I, Nos. 5-6 (September-November).

**Mulvaney, D. J.**

- 1966 "The Prehistory of the Australian Aborigine," *Scientific American*, Vol. 214, No. 3 (March).

**Oakley, K. P.**

- 1950 *Man: The Tool-Maker* (London: The Trustees of the British Museum).

**Peacock, B. A.V.**

- 1959 "A Short Description of Malayan Prehistoric Pottery," *Asian Perspectives*, Vol. III, No. 2 (Winter).

**Romero, Jose P.**

- 1965 "Galang-Making: A Heritage from the Past," A paper prepared during the Field Project of the Summer Institute at Quezon, Palawan, in 1965, sponsored jointly by the Department of Anthropology, University of the Philippines, and the Division of Anthropology, National Museum.

**Scheans, Daniel J.**

- 1966 "A New View of Philippine's Pottery Manufacture," *South-western Journal of Anthropology*, Vol. 22, No. 2. (Summer).

**Scott, William Henry**

- 1968 *A Critical Study of the Prehispanic Source Materials for the Study of Philippine History*. (Manila: University of Santo Tomas Press).

**Sharma, V. D.**

- 1953 "Exploration of Historical Sites," *Ancient India* No. 2 (Kanpur: Job Press Ltd.).

**Shawcross, Wilfred**

- 1964 "Stone Flake Industries in New Zealand," *The Journal of the Polynesian Society*, Vol. 73, No. 1 (March).

**Shepard, Anna O.**

- 1957 *Ceramics for the Archaeologists*, Publication 609, Carnegie Institution of Washington, Washington, D.C.

**Shutler, Richard Jr.**

- 1961 "Application of Palynology to Archaeological and Environmental Problems in the Pacific," *Asian Perspectives*, Vol. V, No. 2 (Winter).  
1965 "Radiocarbon Dating in the Pacific," paper presented at International C-14 and H<sup>3</sup> Dating Conference, Pullman, Wash-ton, June 7-11. Mimeo.

**Solheim, Wilhelm G., II**

- 1951 "Preliminary Report on Archaeological Field Work in San Narciso, Tayabas, P.I.," *University of Manila, Journal of East Asiatic Studies*, Vol. 1, No. 1 (October).
- 1952 "Paddle Decoration of Pottery," *The University of Manila Journal of East Asiatic Studies*, Vol. II, No. 1 (October).
- 1954 "The Makabog Burial Jar Sites," *The Philippine Journal of Science*, Vol. 83, No. 1 (March).
- 1959a "Further Notes on the Kalanay Pottery Complex in the P.I.," *Asian Perspectives*, Vol. III, No. 2. (Winter).
- 1959b "Introduction to Sa-Huynh," *Asian Perspectives*, Vol. III, No. 2. (Winter).
- 1960 "Jar Burial in the Babuyan and Batanes Islands and in Central Philippines, and Its Relationship to Jar Burial elsewhere in the Far East," *The Philippine Journal of Science*, Vol. 89, No. 1 (March.)
- 1964a *The Archaeology of Central Philippines: A Study Chiefly of the Iron Age and its Relationships*. Manila: Bureau of Printing.
- 1964b "Future Relationships of The Sa-Huynh-Kalanay Pottery Tradition," *Asian Perspectives*, Vol. VIII, No. 2. (Summer).

**Solheim, Wilhelm G., Barbara Harrisson, and Lindsey Wall**

- 1961 "Niah 'Three Colour Ware' and Related Prehistoric Pottery," *Sarawak Museum Journal*, Vol. X, Nos. 17-18 (New Series).

**Sørensen, Per**

- 1967 *Archaeological Excavations in Thailand*, Vol. II, *Ban-Kao, Neolithic Settlements with Cemeteries in the Kanchanalium Province* (Copenhagen: Munksgaard).

**Suggs, Robert Carl**

- 1961 "The Archaeology of Nuku Hiva, Marquesos Islands, French Polynesia," *Anthropological Papers of the American Museum of Natural History*, Vol. 49: Part I.

**Tangco, Marcelo**

- 1951 "The Christian Peoples of the Philippines," *Natural and Applied Science Bulletin*, Vol. XI, No. 1, Quezon City.

**Viola, David**

- 1965 "Pottery-Making Among the Palawan," A typescript prepared during the Field Project of the Summer Institute, at Quezon, Palawan, in 1965, sponsored jointly by the De-

partment of Anthropology, University of the Philippines, and the Division of Anthropology, National Museum.

**Wall, Lindsay**

- 1962 "Earthenwares: Prehistoric Pottery Common to Malaya and Borneo," *The Sarawak Museum Journal*, Vol. X, Nos. 19-20. (July-December).

**Wheatley, Paul**

- 1959 "Geological Notes on Some Commodities Involved in Sung Maritime Trade," *Journal of the Malayan Branch Royal Asiatic Society*, Vol. 32, pt. 2 (June).

**Williams, Thomas Rhys**

- 1962 "Archaeological Research in North Borneo," *Asian Perspectives*, Vol. VI, Nos. 1-2 (Summer-Winter).

**Zaide, Gregorio F.**

- 1949 *The Philippines Since Pre-Spanish Times*, (Manila: R. P. Garcia Publishing Co.).

**Zeuner, F. E.**

- 1960 "Advance in Chronological Research," *The Application of Quantitative Methods in Archaeology*, Viking Fund Publication in Anthropology, Number Twenty-Eighth (New York).

**Zim, Herbert S. and Paul R. Shaffer**

- 1957 *Rocks and Minerals: A Guide to Familiar Minerals, Gems, Ores, and Rocks* (New York: Simon and Schuster).

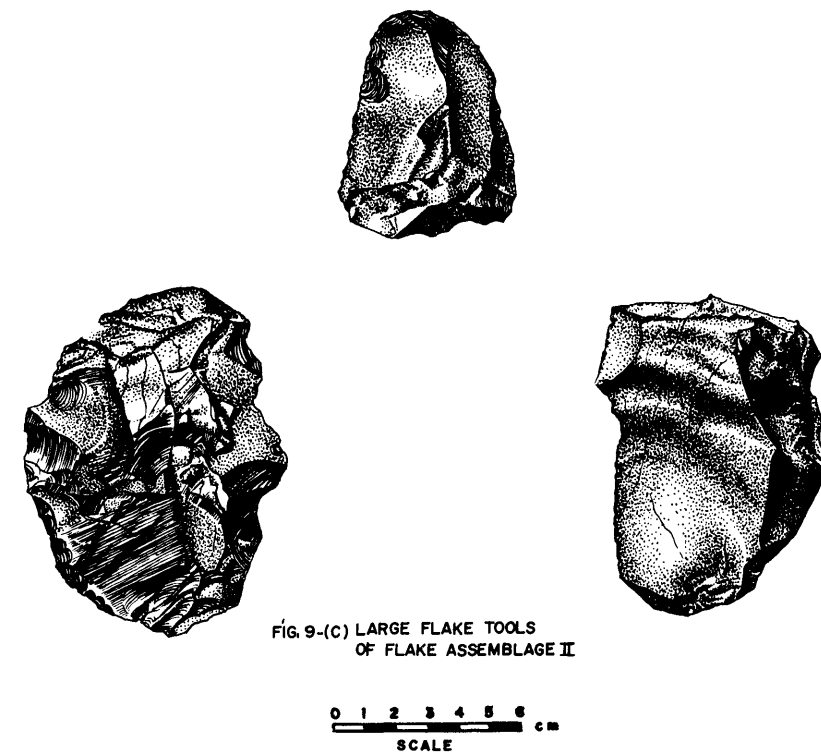
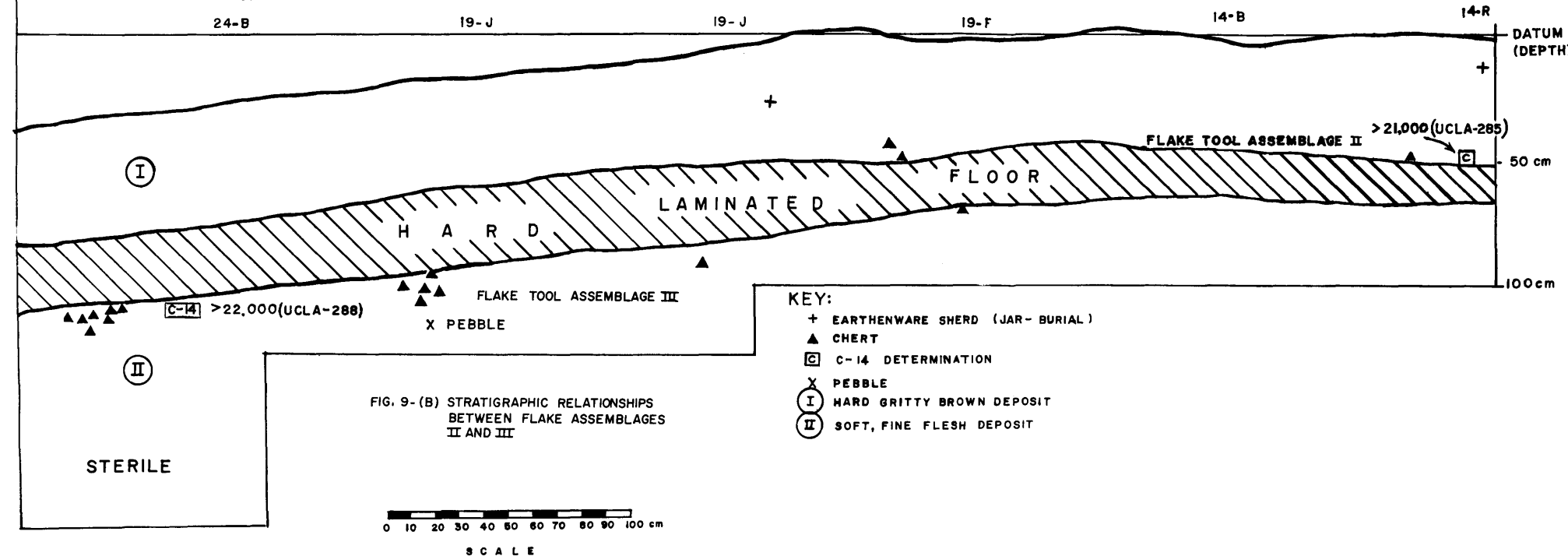
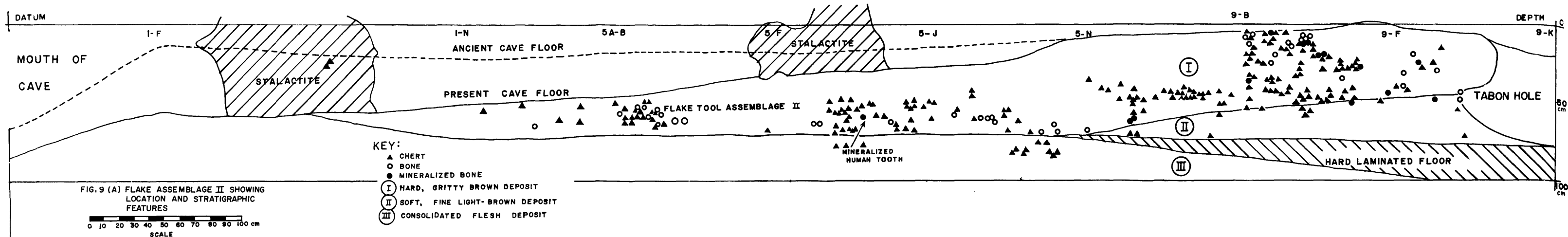


Fig. 9. Stratigraphic profiles in Tabon Cave: (A) Flake Assemblage II showing location and stratigraphic features; (B) Stratigraphic relationships between Flake Assemblages II and III; and (C) Large Flake tools of Flake Assemblage II.

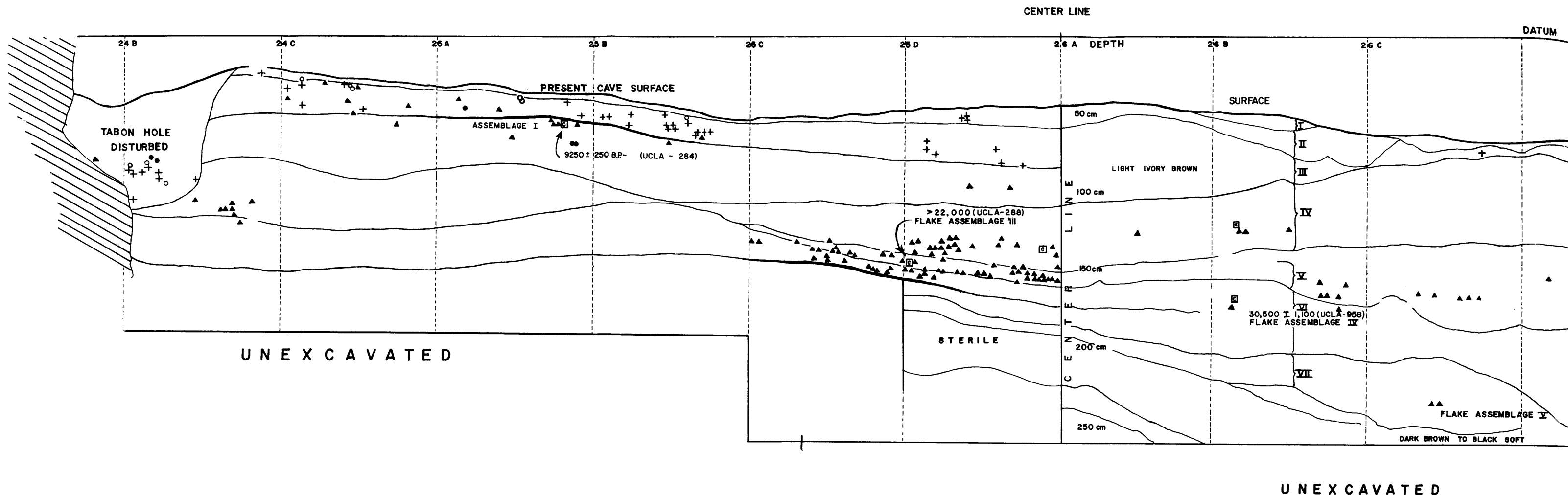


Fig. 10. Schematic profile of Lateral 11.5 in Tabon Cave, showing stratigraphic relationships of Flake Assemblages, I, III, IV, and V. (1966)

#### KEY:

- + EARTHENWARE SHERD (JAR BURIAL)
- BONE
- ▲ CHERT
- MINERALIZED BONE
- ☐ C-14 SAMPLE WITH DATE
- I COMPACT, GRITTY-GRAYBROWN DEPOSIT (DISTURBED)
- II SOFT, FINE LIGHT-GRAY TO DARK-GRAY DEPOSIT
- III SOFT, FINE GRAY-BROWN TO BROWN DEPOSIT
- IV SOFT FINE IVORY OR GRAY-IVORY DEPOSIT
- V SOFT FINE FLESH DEPOSIT (PINK IN AREAS)
- VI SOFT TO HARD BROWN TO RED BROWN DEPOSIT
- VII HARD

# ILLUSTRATIONS

# ILLUSTRATIONS

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION  
PUBLISHED WEEKLY  
535 N. Dearborn Ave., Chicago 10, Ill.  
Subscription price: \$5.00 per year in advance.  
Single copies: 15¢.  
Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917. Authorized by Act of October 3, 1917.  
Postage paid at Chicago, Ill.  
Second-class postage paid at New York, N.Y.  
Copyright, 1954, by American Medical Association  
Printed at the American Medical Association, 535 N. Dearborn Ave., Chicago 10, Ill.

1964a "Further Notes on the History of the  
of the Department of the Interior, Bureau of  
of the Department of the Interior, Bureau of

1999 Year Journal in the Classroom and Learning Journal sent to

1. **NAME:** \_\_\_\_\_  
 2. **ADDRESS:** \_\_\_\_\_  
 3. **CITY:** \_\_\_\_\_  
 4. **STATE:** \_\_\_\_\_  
 5. **ZIP:** \_\_\_\_\_  
 6. **PHONE:** \_\_\_\_\_  
 7. **DATE:** \_\_\_\_\_  
 8. **SIGNATURE:** \_\_\_\_\_  
 9. **PRINT NAME:** \_\_\_\_\_  
 10. **PRINT ADDRESS:** \_\_\_\_\_  
 11. **PRINT CITY:** \_\_\_\_\_  
 12. **PRINT STATE:** \_\_\_\_\_  
 13. **PRINT ZIP:** \_\_\_\_\_  
 14. **PRINT PHONE:** \_\_\_\_\_  
 15. **PRINT DATE:** \_\_\_\_\_  
 16. **PRINT SIGNATURE:** \_\_\_\_\_  
 17. **PRINT NAME:** \_\_\_\_\_  
 18. **PRINT ADDRESS:** \_\_\_\_\_  
 19. **PRINT CITY:** \_\_\_\_\_  
 20. **PRINT STATE:** \_\_\_\_\_  
 21. **PRINT ZIP:** \_\_\_\_\_  
 22. **PRINT PHONE:** \_\_\_\_\_  
 23. **PRINT DATE:** \_\_\_\_\_  
 24. **PRINT SIGNATURE:** \_\_\_\_\_  
 25. **PRINT NAME:** \_\_\_\_\_  
 26. **PRINT ADDRESS:** \_\_\_\_\_  
 27. **PRINT CITY:** \_\_\_\_\_  
 28. **PRINT STATE:** \_\_\_\_\_  
 29. **PRINT ZIP:** \_\_\_\_\_  
 30. **PRINT PHONE:** \_\_\_\_\_  
 31. **PRINT DATE:** \_\_\_\_\_  
 32. **PRINT SIGNATURE:** \_\_\_\_\_  
 33. **PRINT NAME:** \_\_\_\_\_  
 34. **PRINT ADDRESS:** \_\_\_\_\_  
 35. **PRINT CITY:** \_\_\_\_\_  
 36. **PRINT STATE:** \_\_\_\_\_  
 37. **PRINT ZIP:** \_\_\_\_\_  
 38. **PRINT PHONE:** \_\_\_\_\_  
 39. **PRINT DATE:** \_\_\_\_\_  
 40. **PRINT SIGNATURE:** \_\_\_\_\_  
 41. **PRINT NAME:** \_\_\_\_\_  
 42. **PRINT ADDRESS:** \_\_\_\_\_  
 43. **PRINT CITY:** \_\_\_\_\_  
 44. **PRINT STATE:** \_\_\_\_\_  
 45. **PRINT ZIP:** \_\_\_\_\_  
 46. **PRINT PHONE:** \_\_\_\_\_  
 47. **PRINT DATE:** \_\_\_\_\_  
 48. **PRINT SIGNATURE:** \_\_\_\_\_  
 49. **PRINT NAME:** \_\_\_\_\_  
 50. **PRINT ADDRESS:** \_\_\_\_\_  
 51. **PRINT CITY:** \_\_\_\_\_  
 52. **PRINT STATE:** \_\_\_\_\_  
 53. **PRINT ZIP:** \_\_\_\_\_  
 54. **PRINT PHONE:** \_\_\_\_\_  
 55. **PRINT DATE:** \_\_\_\_\_  
 56. **PRINT SIGNATURE:** \_\_\_\_\_  
 57. **PRINT NAME:** \_\_\_\_\_  
 58. **PRINT ADDRESS:** \_\_\_\_\_  
 59. **PRINT CITY:** \_\_\_\_\_  
 60. **PRINT STATE:** \_\_\_\_\_  
 61. **PRINT ZIP:** \_\_\_\_\_  
 62. **PRINT PHONE:** \_\_\_\_\_  
 63. **PRINT DATE:** \_\_\_\_\_  
 64. **PRINT SIGNATURE:** \_\_\_\_\_  
 65. **PRINT NAME:** \_\_\_\_\_  
 66. **PRINT ADDRESS:** \_\_\_\_\_  
 67. **PRINT CITY:** \_\_\_\_\_  
 68. **PRINT STATE:** \_\_\_\_\_  
 69. **PRINT ZIP:** \_\_\_\_\_  
 70. **PRINT PHONE:** \_\_\_\_\_  
 71. **PRINT DATE:** \_\_\_\_\_  
 72. **PRINT SIGNATURE:** \_\_\_\_\_  
 73. **PRINT NAME:** \_\_\_\_\_  
 74. **PRINT ADDRESS:** \_\_\_\_\_  
 75. **PRINT CITY:** \_\_\_\_\_  
 76. **PRINT STATE:** \_\_\_\_\_  
 77. **PRINT ZIP:** \_\_\_\_\_  
 78. **PRINT PHONE:** \_\_\_\_\_  
 79. **PRINT DATE:** \_\_\_\_\_  
 80. **PRINT SIGNATURE:** \_\_\_\_\_  
 81. **PRINT NAME:** \_\_\_\_\_  
 82. **PRINT ADDRESS:** \_\_\_\_\_  
 83. **PRINT CITY:** \_\_\_\_\_  
 84. **PRINT STATE:** \_\_\_\_\_  
 85. **PRINT ZIP:** \_\_\_\_\_  
 86. **PRINT PHONE:** \_\_\_\_\_  
 87. **PRINT DATE:** \_\_\_\_\_  
 88. **PRINT SIGNATURE:** \_\_\_\_\_  
 89. **PRINT NAME:** \_\_\_\_\_  
 90. **PRINT ADDRESS:** \_\_\_\_\_  
 91. **PRINT CITY:** \_\_\_\_\_  
 92. **PRINT STATE:** \_\_\_\_\_  
 93. **PRINT ZIP:** \_\_\_\_\_  
 94. **PRINT PHONE:** \_\_\_\_\_  
 95. **PRINT DATE:** \_\_\_\_\_  
 96. **PRINT SIGNATURE:** \_\_\_\_\_  
 97. **PRINT NAME:** \_\_\_\_\_  
 98. **PRINT ADDRESS:** \_\_\_\_\_  
 99. **PRINT CITY:** \_\_\_\_\_  
 100. **PRINT STATE:** \_\_\_\_\_  
 101. **PRINT ZIP:** \_\_\_\_\_  
 102. **PRINT PHONE:** \_\_\_\_\_  
 103. **PRINT DATE:** \_\_\_\_\_  
 104. **PRINT SIGNATURE:** \_\_\_\_\_  
 105. **PRINT NAME:** \_\_\_\_\_  
 106. **PRINT ADDRESS:** \_\_\_\_\_  
 107. **PRINT CITY:** \_\_\_\_\_  
 108. **PRINT STATE:** \_\_\_\_\_  
 109. **PRINT ZIP:** \_\_\_\_\_  
 110. **PRINT PHONE:** \_\_\_\_\_  
 111. **PRINT DATE:** \_\_\_\_\_  
 112. **PRINT SIGNATURE:** \_\_\_\_\_  
 113. **PRINT NAME:** \_\_\_\_\_  
 114. **PRINT ADDRESS:** \_\_\_\_\_  
 115. **PRINT CITY:** \_\_\_\_\_  
 116. **PRINT STATE:** \_\_\_\_\_  
 117. **PRINT ZIP:** \_\_\_\_\_  
 118. **PRINT PHONE:** \_\_\_\_\_  
 119. **PRINT DATE:** \_\_\_\_\_  
 120. **PRINT SIGNATURE:** \_\_\_\_\_  
 121. **PRINT NAME:** \_\_\_\_\_  
 122. **PRINT ADDRESS:** \_\_\_\_\_  
 123. **PRINT CITY:** \_\_\_\_\_  
 124. **PRINT STATE:** \_\_\_\_\_  
 125. **PRINT ZIP:** \_\_\_\_\_  
 126. **PRINT PHONE:** \_\_\_\_\_  
 127. **PRINT DATE:** \_\_\_\_\_  
 128. **PRINT SIGNATURE:** \_\_\_\_\_  
 129. **PRINT NAME:** \_\_\_\_\_  
 130. **PRINT ADDRESS:** \_\_\_\_\_  
 131. **PRINT CITY:** \_\_\_\_\_  
 132. **PRINT STATE:** \_\_\_\_\_  
 133. **PRINT ZIP:** \_\_\_\_\_  
 134. **PRINT PHONE:** \_\_\_\_\_  
 135. **PRINT DATE:** \_\_\_\_\_  
 136. **PRINT SIGNATURE:** \_\_\_\_\_  
 137. **PRINT NAME:** \_\_\_\_\_  
 138. **PRINT ADDRESS:** \_\_\_\_\_  
 139. **PRINT CITY:** \_\_\_\_\_  
 140. **PRINT STATE:** \_\_\_\_\_  
 141. **PRINT ZIP:** \_\_\_\_\_  
 142. **PRINT PHONE:** \_\_\_\_\_  
 143. **PRINT DATE:** \_\_\_\_\_  
 144. **PRINT SIGNATURE:** \_\_\_\_\_  
 145. **PRINT NAME:** \_\_\_\_\_  
 146. **PRINT ADDRESS:** \_\_\_\_\_  
 147. **PRINT CITY:** \_\_\_\_\_  
 148. **PRINT STATE:** \_\_\_\_\_  
 149. **PRINT ZIP:** \_\_\_\_\_  
 150. **PRINT PHONE:** \_\_\_\_\_  
 151. **PRINT DATE:** \_\_\_\_\_  
 152. **PRINT SIGNATURE:** \_\_\_\_\_  
 153. **PRINT NAME:** \_\_\_\_\_  
 154. **PRINT ADDRESS:** \_\_\_\_\_  
 155. **PRINT CITY:** \_\_\_\_\_  
 156. **PRINT STATE:** \_\_\_\_\_  
 157. **PRINT ZIP:** \_\_\_\_\_  
 158. **PRINT PHONE:** \_\_\_\_\_  
 159. **PRINT DATE:** \_\_\_\_\_  
 160. **PRINT SIGNATURE:** \_\_\_\_\_  
 161. **PRINT NAME:** \_\_\_\_\_  
 162. **PRINT ADDRESS:** \_\_\_\_\_  
 163. **PRINT CITY:** \_\_\_\_\_  
 164. **PRINT STATE:** \_\_\_\_\_  
 165. **PRINT ZIP:** \_\_\_\_\_  
 166. **PRINT PHONE:** \_\_\_\_\_  
 167. **PRINT DATE:** \_\_\_\_\_  
 168. **PRINT SIGNATURE:** \_\_\_\_\_  
 169. **PRINT NAME:** \_\_\_\_\_  
 170. **PRINT ADDRESS:** \_\_\_\_\_  
 171. **PRINT CITY:** \_\_\_\_\_  
 172. **PRINT STATE:** \_\_\_\_\_  
 173. **PRINT ZIP:** \_\_\_\_\_  
 174. **PRINT PHONE:** \_\_\_\_\_  
 175. **PRINT DATE:** \_\_\_\_\_  
 176. **PRINT SIGNATURE:** \_\_\_\_\_  
 177. **PRINT NAME:** \_\_\_\_\_  
 178. **PRINT ADDRESS:** \_\_\_\_\_  
 179. **PRINT CITY:** \_\_\_\_\_  
 180. **PRINT STATE:** \_\_\_\_\_  
 181. **PRINT ZIP:** \_\_\_\_\_  
 182. **PRINT PHONE:** \_\_\_\_\_  
 183. **PRINT DATE:** \_\_\_\_\_  
 184. **PRINT SIGNATURE:** \_\_\_\_\_  
 185. **PRINT NAME:** \_\_\_\_\_  
 186. **PRINT ADDRESS:** \_\_\_\_\_  
 187. **PRINT CITY:** \_\_\_\_\_  
 188. **PRINT STATE:** \_\_\_\_\_  
 189. **PRINT ZIP:** \_\_\_\_\_  
 190. **PRINT PHONE:** \_\_\_\_\_  
 191. **PRINT DATE:** \_\_\_\_\_  
 192. **PRINT SIGNATURE:** \_\_\_\_\_  
 193. **PRINT NAME:** \_\_\_\_\_  
 194. **PRINT ADDRESS:** \_\_\_\_\_  
 195. **PRINT CITY:** \_\_\_\_\_  
 196. **PRINT STATE:** \_\_\_\_\_  
 197. **PRINT ZIP:** \_\_\_\_\_  
 198. **PRINT PHONE:** \_\_\_\_\_  
 199. **PRINT DATE:** \_\_\_\_\_  
 200. **PRINT SIGNATURE:** \_\_\_\_\_  
 201. **PRINT NAME:** \_\_\_\_\_  
 202. **PRINT ADDRESS:** \_\_\_\_\_  
 203. **PRINT CITY:** \_\_\_\_\_  
 204. **PRINT STATE:** \_\_\_\_\_  
 205. **PRINT ZIP:** \_\_\_\_\_  
 206. **PRINT PHONE:** \_\_\_\_\_  
 207. **PRINT DATE:** \_\_\_\_\_  
 208. **PRINT SIGNATURE:** \_\_\_\_\_  
 209. **PRINT NAME:** \_\_\_\_\_  
 210. **PRINT ADDRESS:** \_\_\_\_\_  
 211. **PRINT CITY:** \_\_\_\_\_  
 212. **PRINT STATE:** \_\_\_\_\_  
 213. **PRINT ZIP:** \_\_\_\_\_  
 214. **PRINT PHONE:** \_\_\_\_\_  
 215. **PRINT DATE:** \_\_\_\_\_  
 216. **PRINT SIGNATURE:** \_\_\_\_\_  
 217. **PRINT NAME:** \_\_\_\_\_  
 218. **PRINT ADDRESS:** \_\_\_\_\_  
 219. **PRINT CITY:** \_\_\_\_\_  
 220. **PRINT STATE:** \_\_\_\_\_

1944-1945: Public Relations of the Government of the United States

Tradition, *Asian Perspectives*, Vol. VIII, No. 15 (Summer 1992).  
 242. Sanyal, R. and Sanyal, R. (1992) *Asian Perspectives*, Vol. VIII, No. 15 (Summer 1992).  
 243. Sanyal, R. and Sanyal, R. (1992) *Asian Perspectives*, Vol. VIII, No. 15 (Summer 1992).

1997-1998, 1999-2000, 2001-2002, 2003-2004, 2005-2006, 2007-2008, 2009-2010, 2011-2012, 2013-2014, 2015-2016, 2017-2018, 2019-2020, 2021-2022, 2023-2024, 2025-2026, 2027-2028, 2029-2030, 2031-2032, 2033-2034, 2035-2036, 2037-2038, 2039-2040, 2041-2042, 2043-2044, 2045-2046, 2047-2048, 2049-2050, 2051-2052, 2053-2054, 2055-2056, 2057-2058, 2059-2060, 2061-2062, 2063-2064, 2065-2066, 2067-2068, 2069-2070, 2071-2072, 2073-2074, 2075-2076, 2077-2078, 2079-2080, 2081-2082, 2083-2084, 2085-2086, 2087-2088, 2089-2090, 2091-2092, 2093-2094, 2095-2096, 2097-2098, 2099-2100, 2101-2102, 2103-2104, 2105-2106, 2107-2108, 2109-2110, 2111-2112, 2113-2114, 2115-2116, 2117-2118, 2119-2120, 2121-2122, 2123-2124, 2125-2126, 2127-2128, 2129-2130, 2131-2132, 2133-2134, 2135-2136, 2137-2138, 2139-2140, 2141-2142, 2143-2144, 2145-2146, 2147-2148, 2149-2150, 2151-2152, 2153-2154, 2155-2156, 2157-2158, 2159-2160, 2161-2162, 2163-2164, 2165-2166, 2167-2168, 2169-2170, 2171-2172, 2173-2174, 2175-2176, 2177-2178, 2179-2180, 2181-2182, 2183-2184, 2185-2186, 2187-2188, 2189-2190, 2191-2192, 2193-2194, 2195-2196, 2197-2198, 2199-2200, 2201-2202, 2203-2204, 2205-2206, 2207-2208, 2209-2210, 2211-2212, 2213-2214, 2215-2216, 2217-2218, 2219-2220, 2221-2222, 2223-2224, 2225-2226, 2227-2228, 2229-2230, 2231-2232, 2233-2234, 2235-2236, 2237-2238, 2239-2240, 2241-2242, 2243-2244, 2245-2246, 2247-2248, 2249-2250, 2251-2252, 2253-2254, 2255-2256, 2257-2258, 2259-2260, 2261-2262, 2263-2264, 2265-2266, 2267-2268, 2269-2270, 2271-2272, 2273-2274, 2275-2276, 2277-2278, 2279-2280, 2281-2282, 2283-2284, 2285-2286, 2287-2288, 2289-2290, 2291-2292, 2293-2294, 2295-2296, 2297-2298, 2299-2300, 2301-2302, 2303-2304, 2305-2306, 2307-2308, 2309-2310, 2311-2312, 2313-2314, 2315-2316, 2317-2318, 2319-2320, 2321-2322, 2323-2324, 2325-2326, 2327-2328, 2329-2330, 2331-2332, 2333-2334, 2335-2336, 2337-2338, 2339-2340, 2341-2342, 2343-2344, 2345-2346, 2347-2348, 2349-2350, 2351-2352, 2353-2354, 2355-2356, 2357-2358, 2359-2360, 2361-2362, 2363-2364, 2365-2366, 2367-2368, 2369-2370, 2371-2372, 2373-2374, 2375-2376, 2377-2378, 2379-2380, 2381-2382, 2383-2384, 2385-2386, 2387-2388, 2389-2390, 2391-2392, 2393-2394, 2395-2396, 2397-2398, 2399-2400, 2401-2402, 2403-2404, 2405-2406, 2407-2408, 2409-2410, 2411-2412, 2413-2414, 2415-2416, 2417-2418, 2419-2420, 2421-2422, 2423-2424, 2425-2426, 2427-2428, 2429-2430, 2431-2432, 2433-2434, 2435-2436, 2437-2438, 2439-2440, 2441-2442, 2443-2444, 2445-2446, 2447-2448, 2449-2450, 2451-2452, 2453-2454, 2455-2456, 2457-2458, 2459-2460, 2461-2462, 2463-2464, 2465-2466, 2467-2468, 2469-2470, 2471-2472, 2473-2474, 2475-2476, 2477-2478, 2479-2480, 2481-2482, 2483-2484, 2485-2486, 2487-2488, 2489-2490, 2491-2492, 2493-2494, 2495-2496, 2497-2498, 2499-2500, 2501-2502, 2503-2504, 2505-2506, 2507-2508, 2509-2510, 2511-2512, 2513-2514, 2515-2516, 2517-2518, 2519-2520, 2521-2522, 2523-2524, 2525-2526, 2527-2528, 2529-2530, 2531-2532, 2533-2534, 2535-2536, 2537-2538, 2539-2540, 2541-2542, 2543-2544, 2545-2546, 2547-2548, 2549-2550, 2551-2552, 2553-2554, 2555-2556, 2557-2558, 2559-2560, 2561-2562, 2563-2564, 2565-2566, 2567-2568, 2569-2570, 2571-2572, 2573-2574, 2575-2576, 2577-2578, 2579-2580, 2581-2582, 2583-2584, 2585-2586, 2587-2588, 2589-2590, 2591-2592, 2593-2594, 2595-2596, 2597-2598, 2599-2600, 2601-2602, 2603-2604, 2605-2606, 2607-2608, 2609-2610, 2611-2612, 2613-2614, 2615-2616, 2617-2618, 2619-2620, 2621-2622, 2623-2624, 2625-2626, 2627-2628, 2629-2630, 2631-2632, 2633-2634, 2635-2636, 2637-2638, 2639-2640, 2641-2642, 2643-2644, 2645-2646, 2647-2648, 2649-2650, 2651-2652, 2653-2654, 2655-2656, 2657-2658, 2659-2660, 2661-2662, 2663-2664, 2665-2666, 2667-2668, 2669-2670, 2671-2672, 2673-2674, 2675-2676, 2677-2678, 2679-2680, 2681-2682, 2683-2684, 2685-2686, 2687-2688, 2689-2690, 2691-2692, 2693-2694, 2695-2696, 2697-2698, 2699-2700, 2701-2702, 2703-2704, 2705-2706, 2707-2708, 2709-2710, 2711-2712, 2713-2714, 2715-2716, 2717-2718, 2719-2720, 2721-2722, 2723-2724, 2725-2726, 2727-2728, 2729-2730, 2731-2732, 2733-2734, 2735-2736, 2737-2738, 2739-2740, 27

101. *Chlorophyll a* and *Chlorophyll b* content of leaves was determined by spectrophotometry using the method of Arnon and Whistler (1940). The leaves were ground in a mortar and pestle with 10 ml of 80% methanol. The extract was centrifuged at 1000 g for 10 min. The supernatant was then transferred to a cuvette and the absorbance was measured at 663 nm and 646 nm. The concentration of chlorophyll *a* and *b* was calculated using the following formulae:

[illegible]

1991 "The Archaeology of Pulau Ubin, Singapore Islands: Progress Report." *Archaeological Report of the National Museum of Singapore*, Vol. 10, Part 1.

1986. *The Christian Heritage of the Philippines: History and Spirituality*. Manila: CCSA. 140 pp. ISBN 978-969-03-0011-1.

10. *Journal of the American Medical Association*, 2000; 284: 1012-1016.

Figure 1. The effect of the concentration of the *Agrobacterium* suspension on the transformation efficiency of *Agrobacterium* strains. The *Agrobacterium* strains were grown in the YEA medium for 24 h at 28 °C. The cell concentration of the *Agrobacterium* strains was adjusted to 10<sup>8</sup> cells/ml. The *Agrobacterium* strains were then mixed with the plant cells and cocultured for 48 h. The transformation efficiency was determined by the number of transformants per 10<sup>6</sup> cells. The data were expressed as the mean ± SD of three independent experiments.

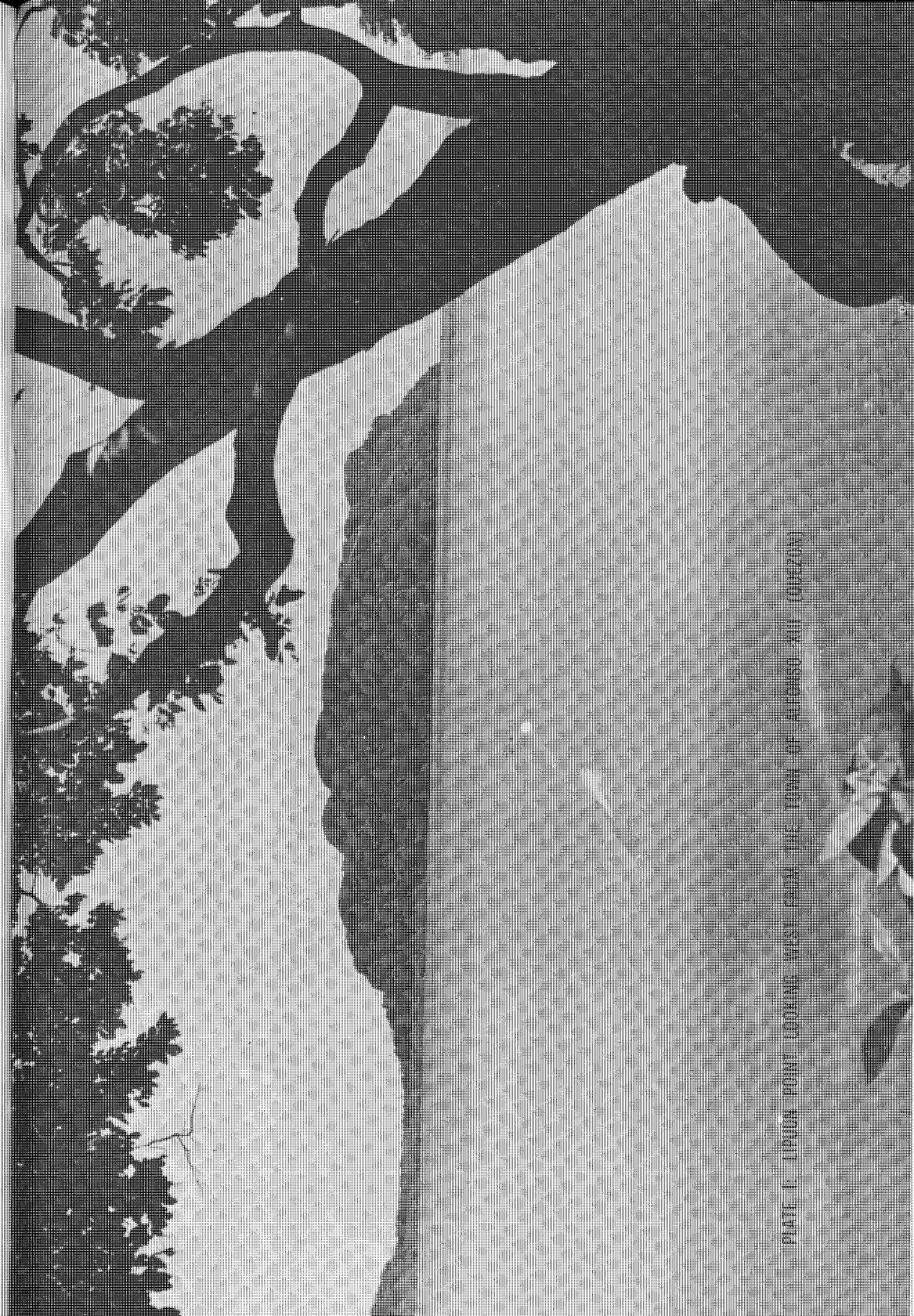






PLATE II: TOWERING LIMESTONE CLIFFS ON CHINA SEA SIDE OF LIPUUN POINT



10000 AUG 2 10 30 52 AM '00 2110 1 1149

PLATE III: MOUTH OF TABON CAVE (IN CIRCLE)



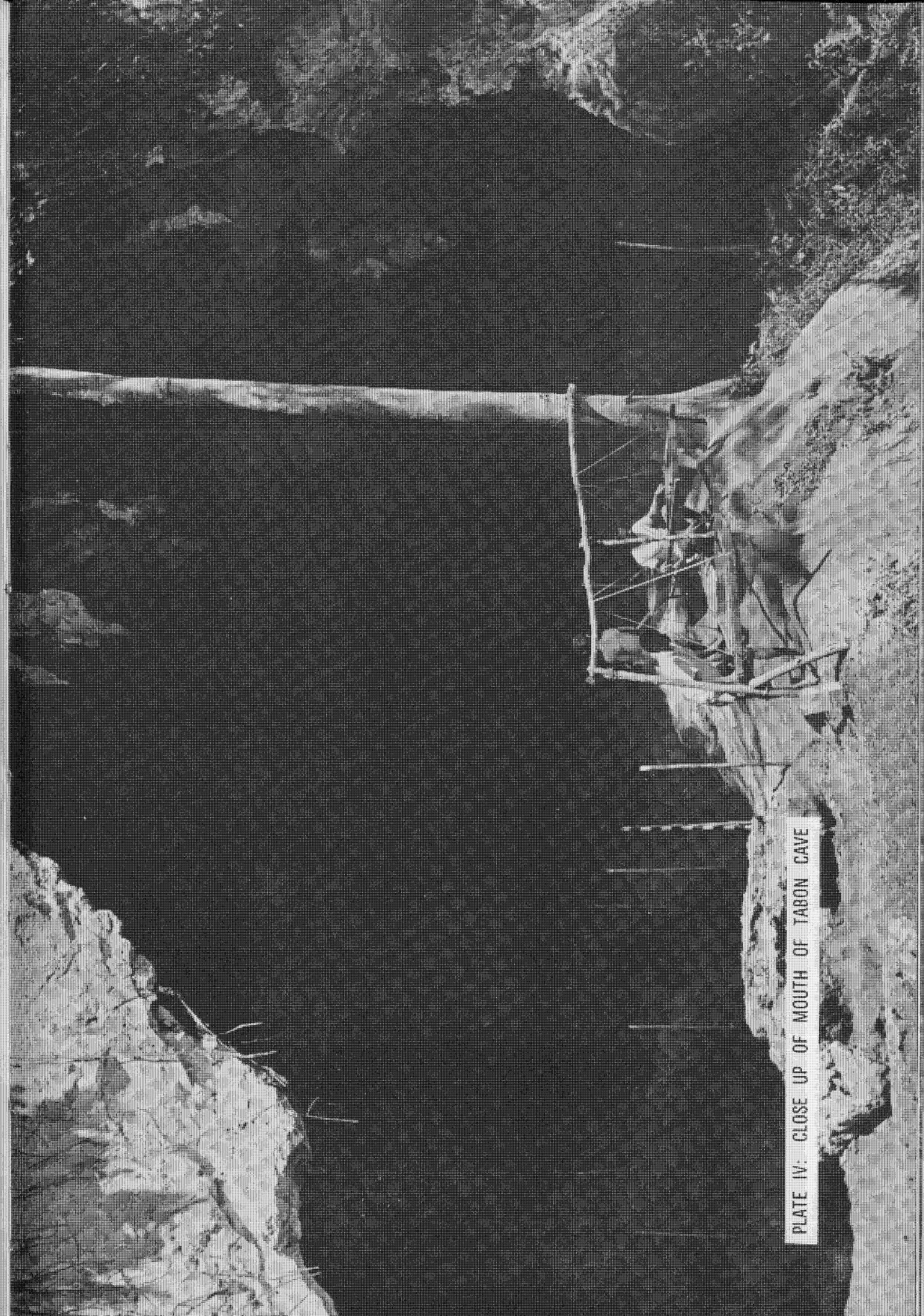


PLATE IV: CLOSE UP OF MOUTH OF TABON CAVE



PLATE IV: CROSSING THE MOUNTAIN OF THE CAVE



PLATE V: OVERLOOKING SOUTH CHINA SEA FROM THE INTERIOR OF TABON CAVE



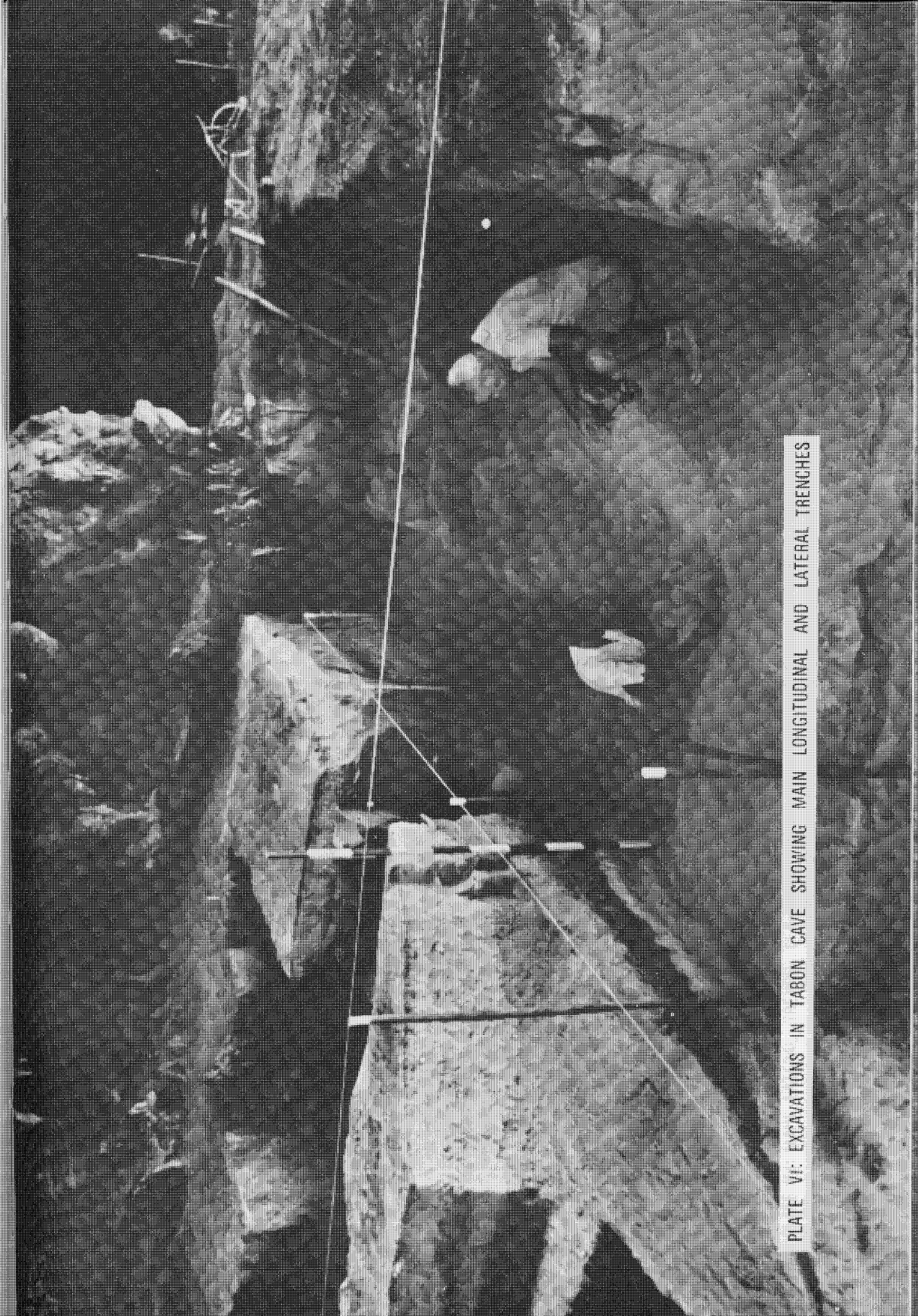


PLATE VI: EXCAVATIONS IN TABON CAVE SHOWING MAIN LONGITUDINAL AND LATERAL TRENCHES



LEVEL AT KARAKAYIYAN, 1950. LEVEL OF KARAKAYIYAN, 1950. LEVEL OF KARAKAYIYAN, 1950.

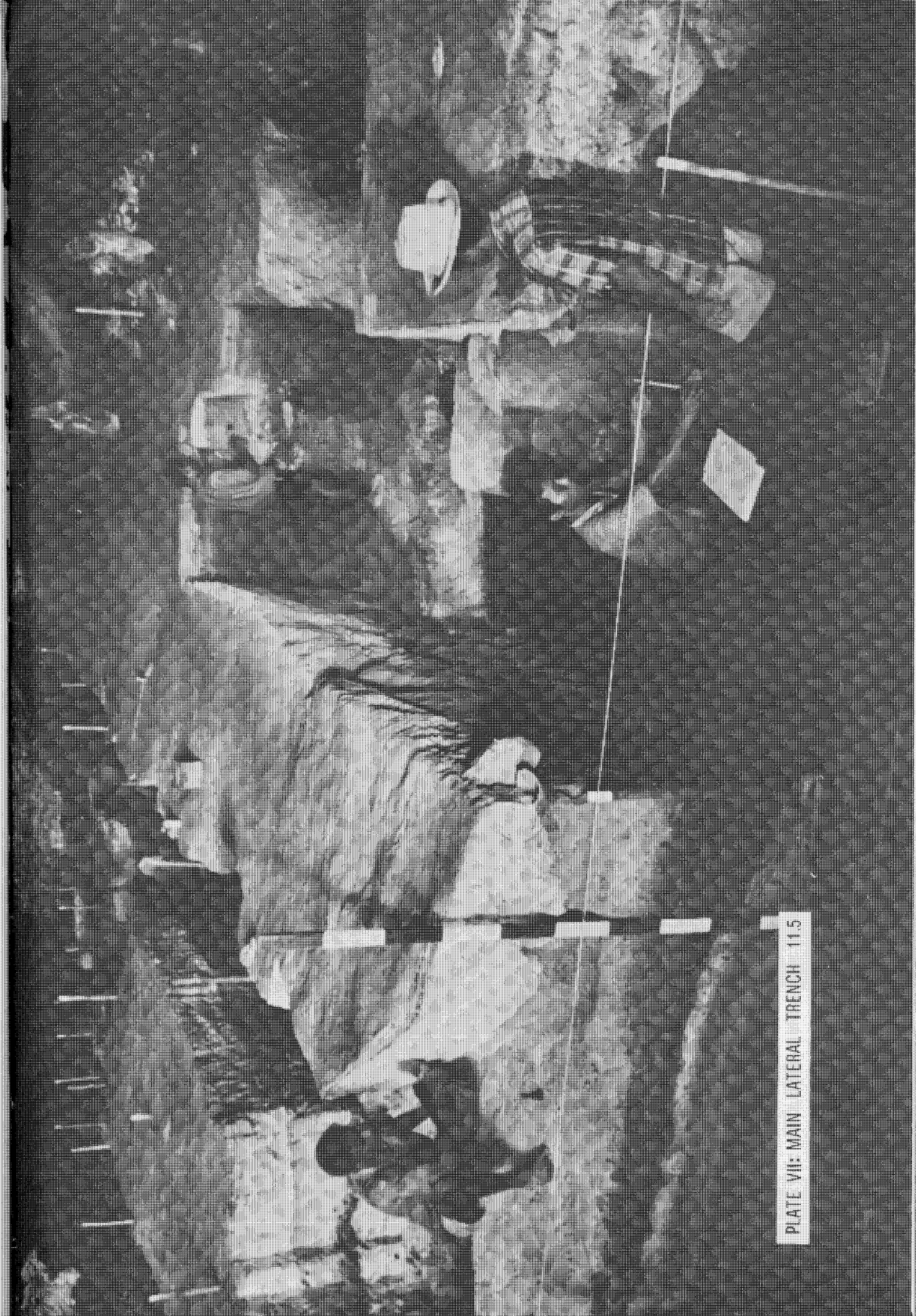


PLATE VII: MAIN LATERAL TRENCH 11.5



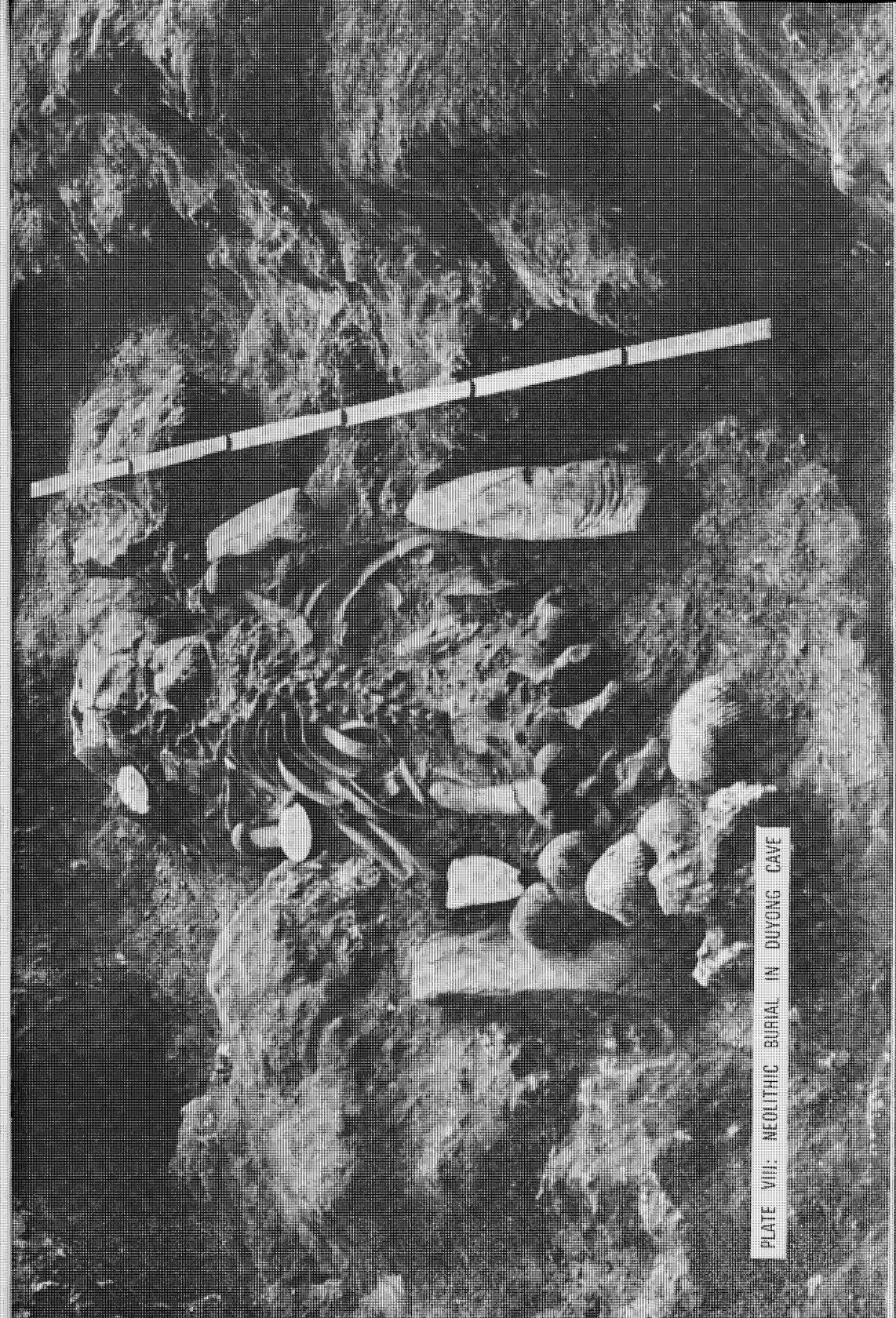


PLATE VIII: NEOLITHIC BURIAL IN DUYONG CAVE



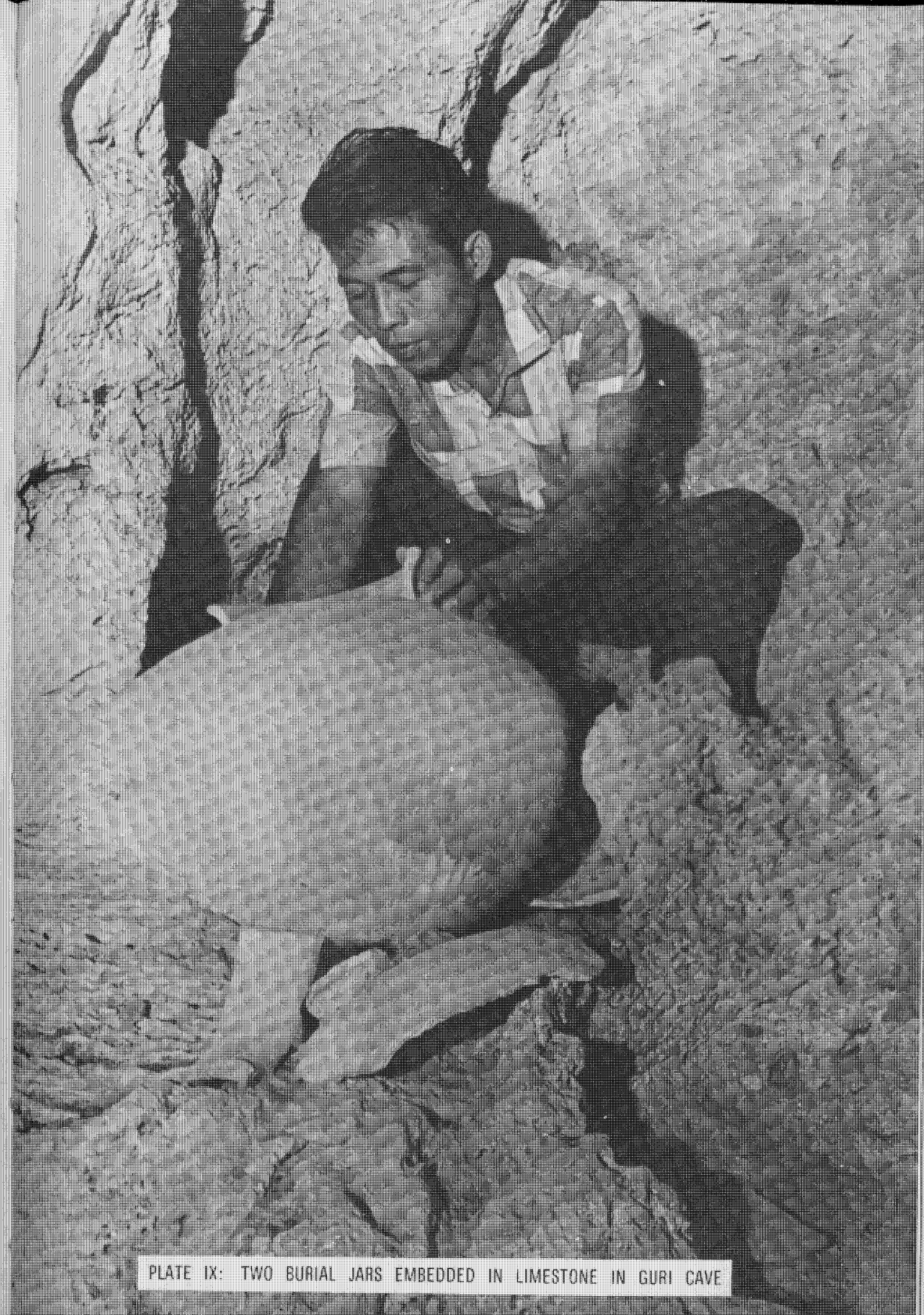


PLATE IX: TWO BURIAL JARS EMBEDDED IN LIMESTONE IN GURI CAVE



PLATE IX: TWO BURIAL TARD EMBEDDED IN LIMESTONE IN MANU CAVE

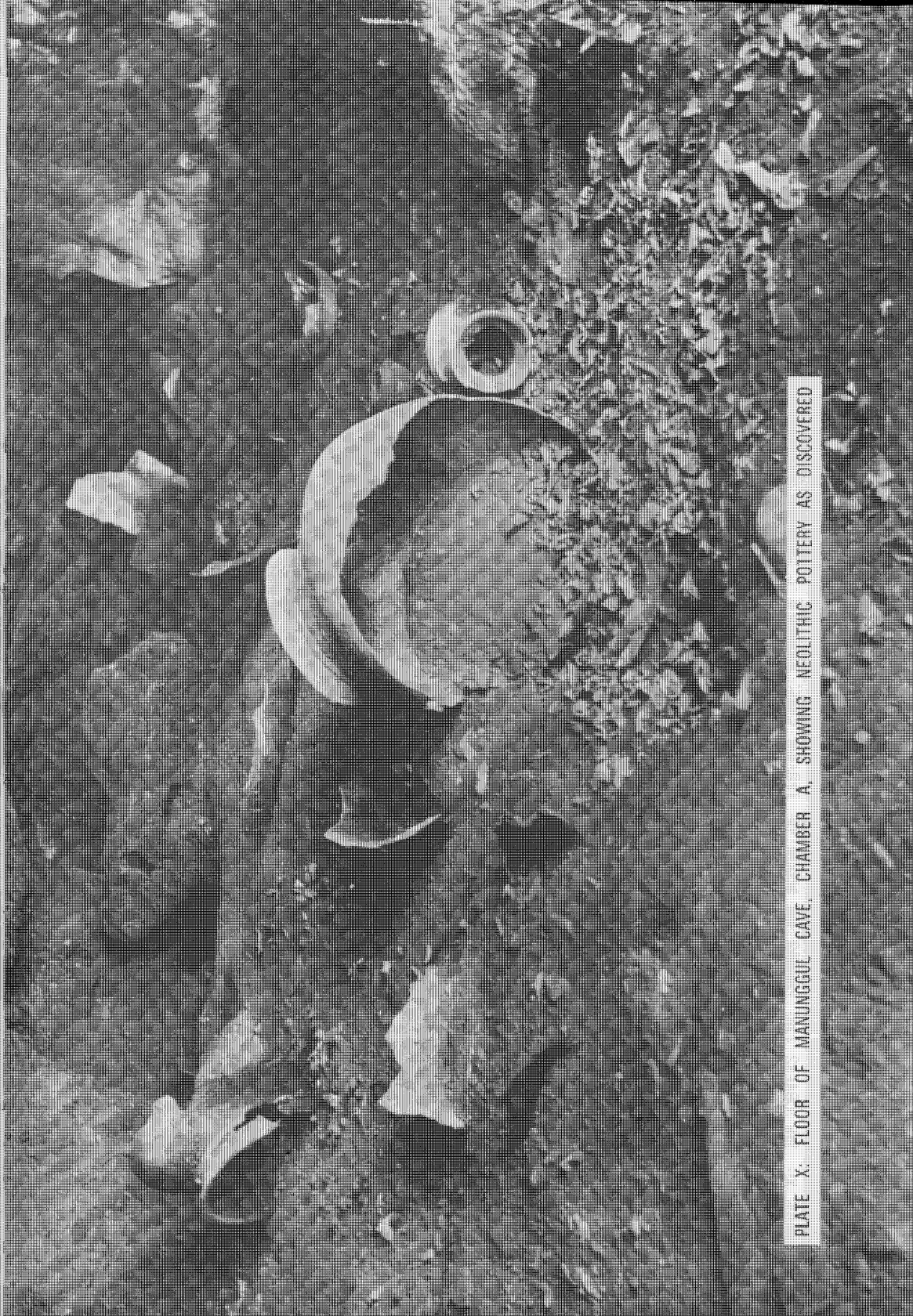


PLATE X: FLOOR OF MANUNGUL CAVE, CHAMBER A, SHOWING NEOLITHIC POTTERY AS DISCOVERED



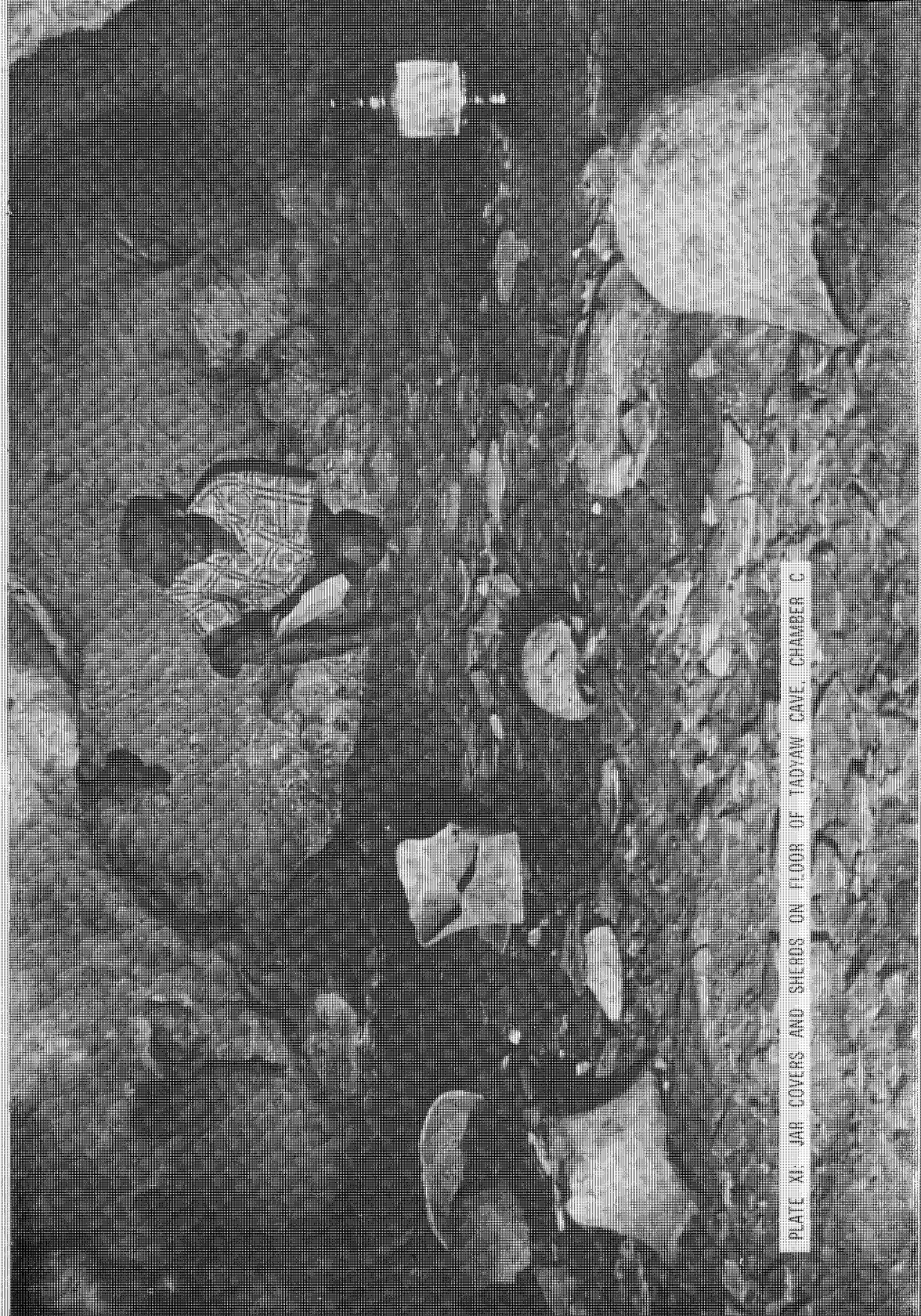


PLATE XI. JAR COVERS AND SHERDS ON FLOOR OF TADYAW CAVE, CHAMBER C

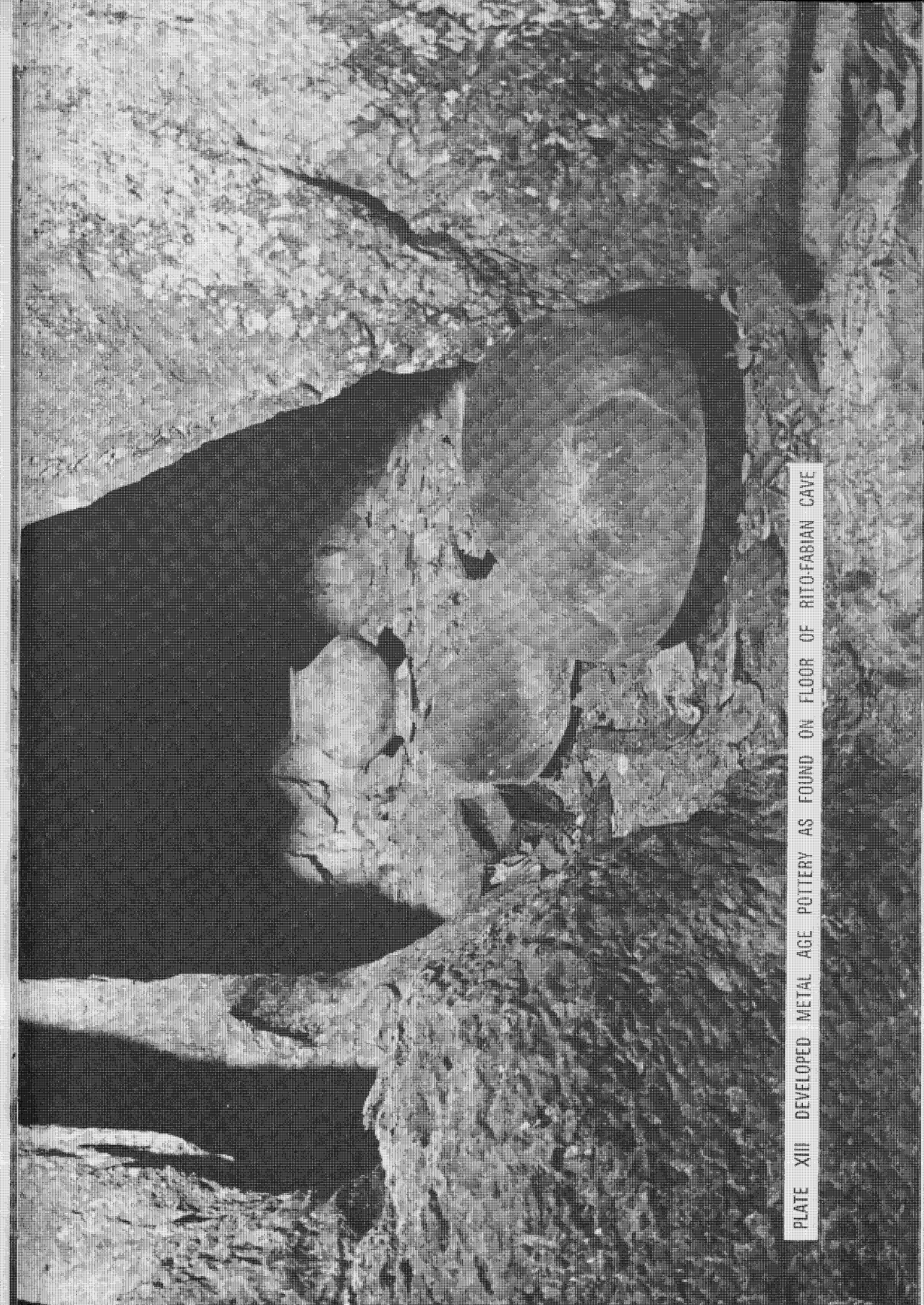


PLATE XII: JAR WITH COVER ON FLOOR OF RITO-FABIAN CAVE



PLATE XII: JAR WITH COVER ON FLOOR OF RITO-FABIAN CAVE







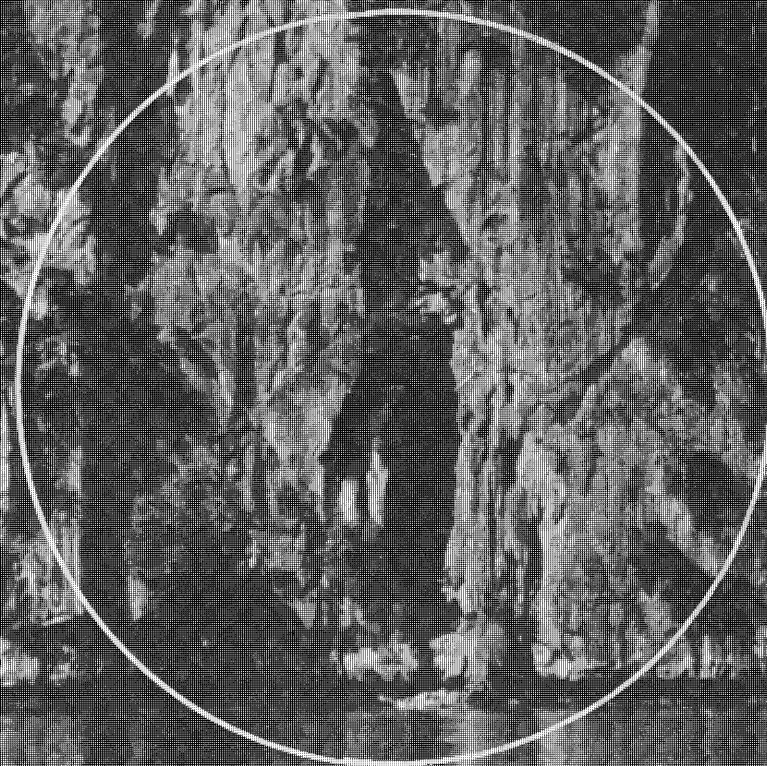
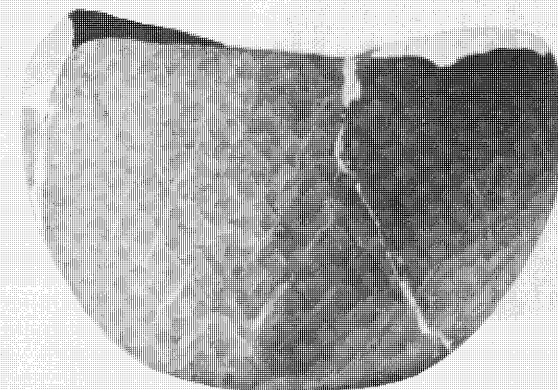


PLATE XIV: LETA LETA CAVE, LANGEN ISLAND, EL NIDO, NORTHWESTERN PALAWAN  
ISLAND



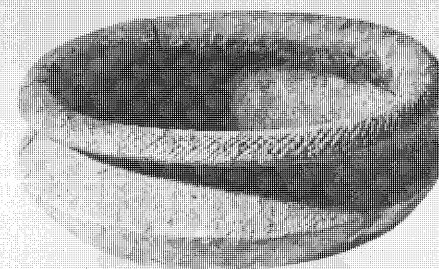
a



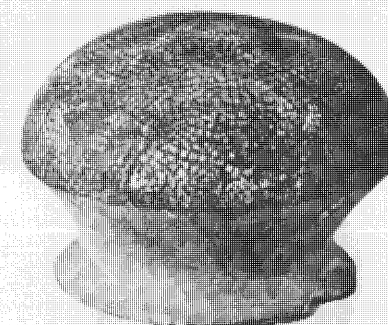
b



c



d



e

PLATE XV: VESSELS OF THE TABON POTTERY COMPLEX: (A) BOWL PAINTED WITH WHITE LINES FORMING DIAMOND PATTERN; (B-D-E) TYPES OF ANGLE WARES WITH IMPRESSED DESIGNS



PLATE XV: VESSELS OF THE TABON POTTERY COMPLEX. (A) BOWL PAINTED WITH  
 WHITE LINES FORMING DIAMOND PATTERN (B-D) TYPES OF ANGIE WARE  
 WITH IMPRESSED DECORATION

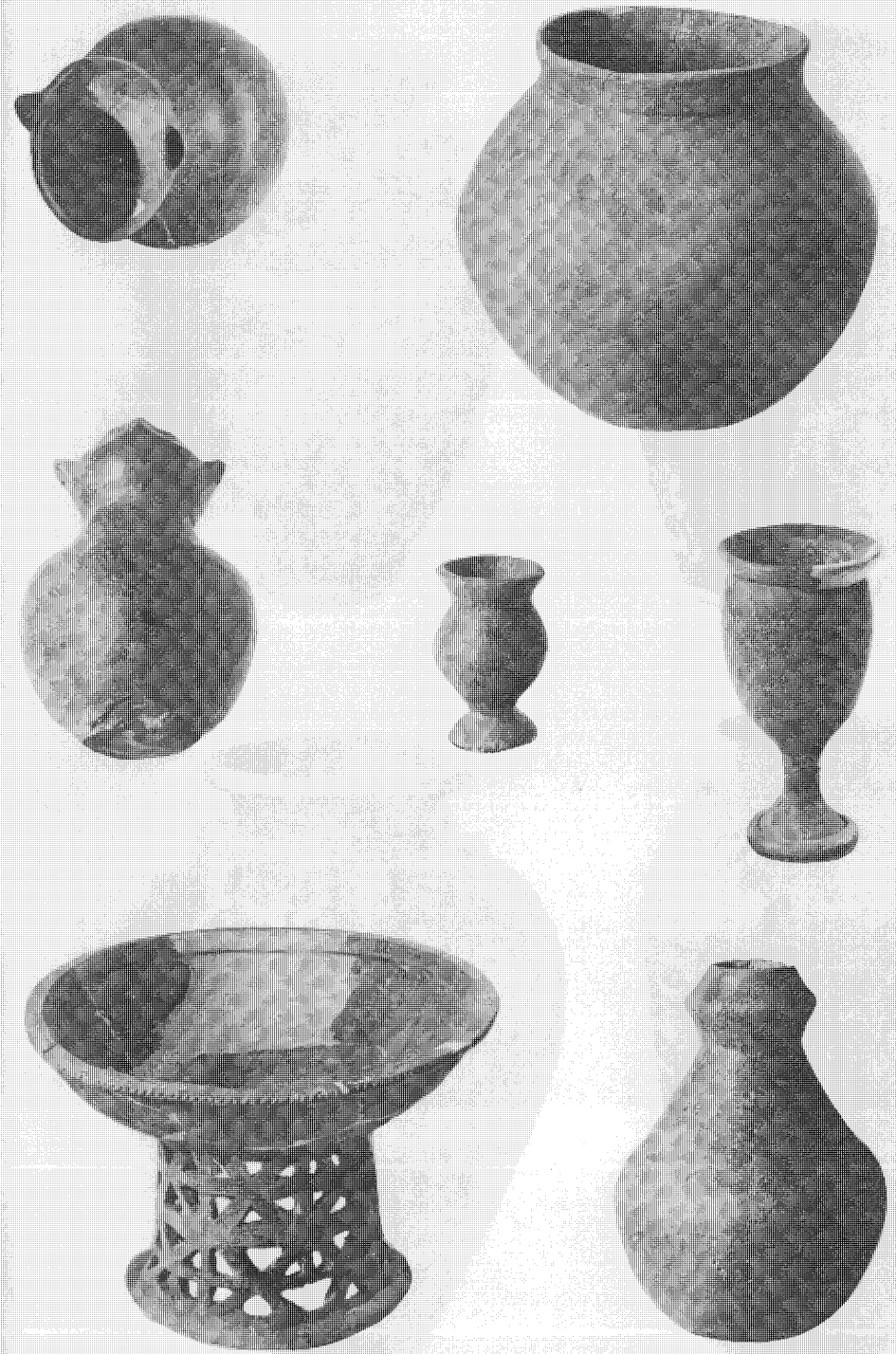


PLATE XVI: SOME POTTERY VESSELS FROM LETA LETA CAVE, EL NIDO

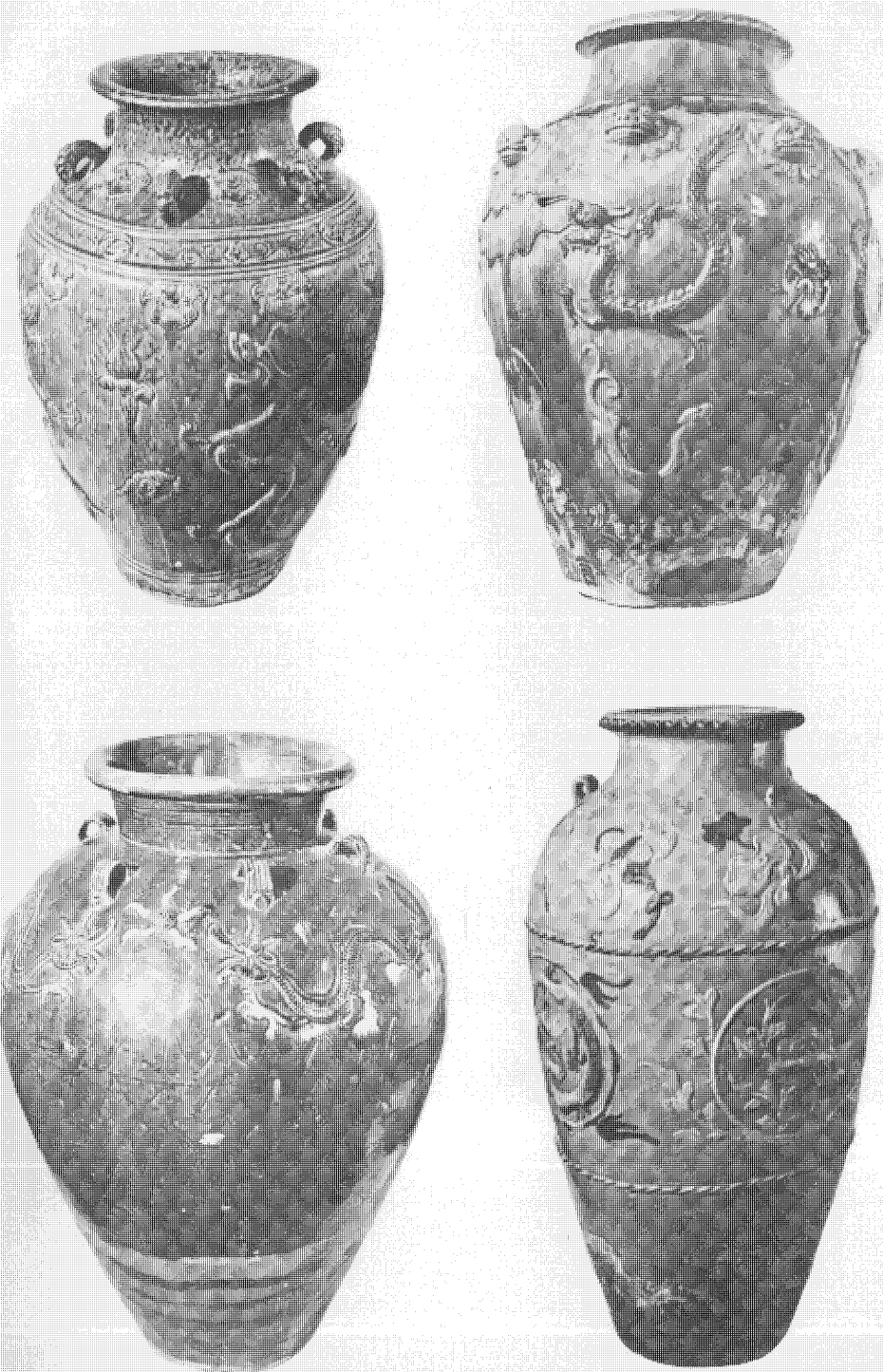


PLATE XVII: EARLY CH'ING STONEWARE JARS FROM SOUTH CHINA USED BY THE  
TAGBANWA AND PALA'WAN FOR MAKING RICE WINE