

# ANTHROPOLOGICAL RECORDS

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## CULTURE ELEMENT DISTRIBUTIONS: XII APACHE-PUEBLO

BY  
E. W. GIFFORD

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# CONTENTS

	Page
Preface . . . . .	v
Introduction . . . . .	1
Localization of lists . . . . .	1
Evaluation of lists . . . . .	2
Informants . . . . .	2
Culture element distributions list . . . . .	5
Symbols used in the element list . . . . .	5
Hunting, elements 1-235 . . . . .	5
Fishing, 236-256 . . . . .	10
Gathering, 257-288 . . . . .	11
Food preparation and storage, 289-501 . . . . .	11
Agriculture, 502-671 . . . . .	16
Pets, 672-701 . . . . .	20
Houses, 702-843 . . . . .	21
Navigation; swimming, 844-856 . . . . .	24
Grinding, 857-900 . . . . .	24
Brushes, 901-909 . . . . .	25
Stirrers and stone lifters, 910-919 . . . . .	25
Special receptacles, 920-934 . . . . .	26
Knives; awls, needles, 935-970 . . . . .	26
Drilling and smoothing, 971-980 . . . . .	27
Woodworking; hammers, mauls, and axes, 981-1002 . . . . .	27
Stone flaking, grinding, and polishing, 1003-1013 . . . . .	28
Fire making, 1014-1022 . . . . .	28
Skin dressing, 1023-1053 . . . . .	28
Weapons, 1054-1223 . . . . .	29
Beads and ornaments, 1224-1269 . . . . .	33
Adhesives and pigments, 1270-1302 . . . . .	34
Hair, body mutilations, and dress, 1303-1484 . . . . .	35
Bedding, 1485-1504 . . . . .	40
Sitting postures, greetings, etc., 1505-1525 . . . . .	41
Burdens, 1526-1600 . . . . .	41
Basketry; matting; cradles, 1601-1729 . . . . .	43, 45
Cordage; woven rabbitskin blankets, 1730-1800 . . . . .	47, 48
Loom weaving, 1801-1860 . . . . .	48
Pottery, 1861-1911 . . . . .	50
Games; toys, 1912-2145 . . . . .	51, 57
Pipes; tobacco, 2146-2180 . . . . .	57
Musical instruments, 2181-2243 . . . . .	58
Calendar; rock pictures; counting; message mnemonics; astronomy, etc., 2243-2323 . . . . .	59, 60
Life crises, 2324-2636 . . . . .	61
Division of labor; "slaves"; land ownership; personal property, 2637-2689 . . . . .	69, 70
War, 2690-2771 . . . . .	71
Political organization; clan organization; kinship systems, 2772-2834 . . . . .	73, 74
Religion, 2835-2990 . . . . .	74
Elements denied by all informants . . . . .	78
Ethnographic notes on the element list . . . . .	81
Notes on habitats and trade . . . . .	187
Analyses . . . . .	190
Universal elements . . . . .	190
Characterization of blocks of tribes by unique features . . . . .	191
Elements common to all Athabascan groups . . . . .	191
Navaho elements . . . . .	192

	Page
Apache elements . . . . .	193
Western Apache elements . . . . .	193
Other Apache elements . . . . .	194
"Eastern" Apache elements . . . . .	194
Jicarilla Apache elements . . . . .	195
Southern Ute elements . . . . .	195
Pueblo elements . . . . .	196
Papago elements . . . . .	196
Concluding remarks . . . . .	197
Statistical analysis, by A. L. Kroeber . . . . .	198
Appendix: Absolute numbers of elements shared and not shared . . . . .	205
Bibliography . . . . .	207
MAPS	
1. Groups investigated . . . . .	facing 1
2. Papago and Pima groups . . . . .	3
TABLES	
1. Percentages of plus and minus . . . . .	198
2. $Q_e$ coefficients on 2636 elements . . . . .	199
3. W percentage coefficients on 2636 elements . . . . .	199
DIAGRAMS	
1. Vertical ranking of $Q_e$ coefficients, 2636 elements . . . . .	200
2. Vertical ranking of W coefficients, 2636 elements . . . . .	200
3. $Q_e$ higher coefficients, 2636 elements . . . . .	201
4. W higher percentage coefficients, 2636 elements . . . . .	201

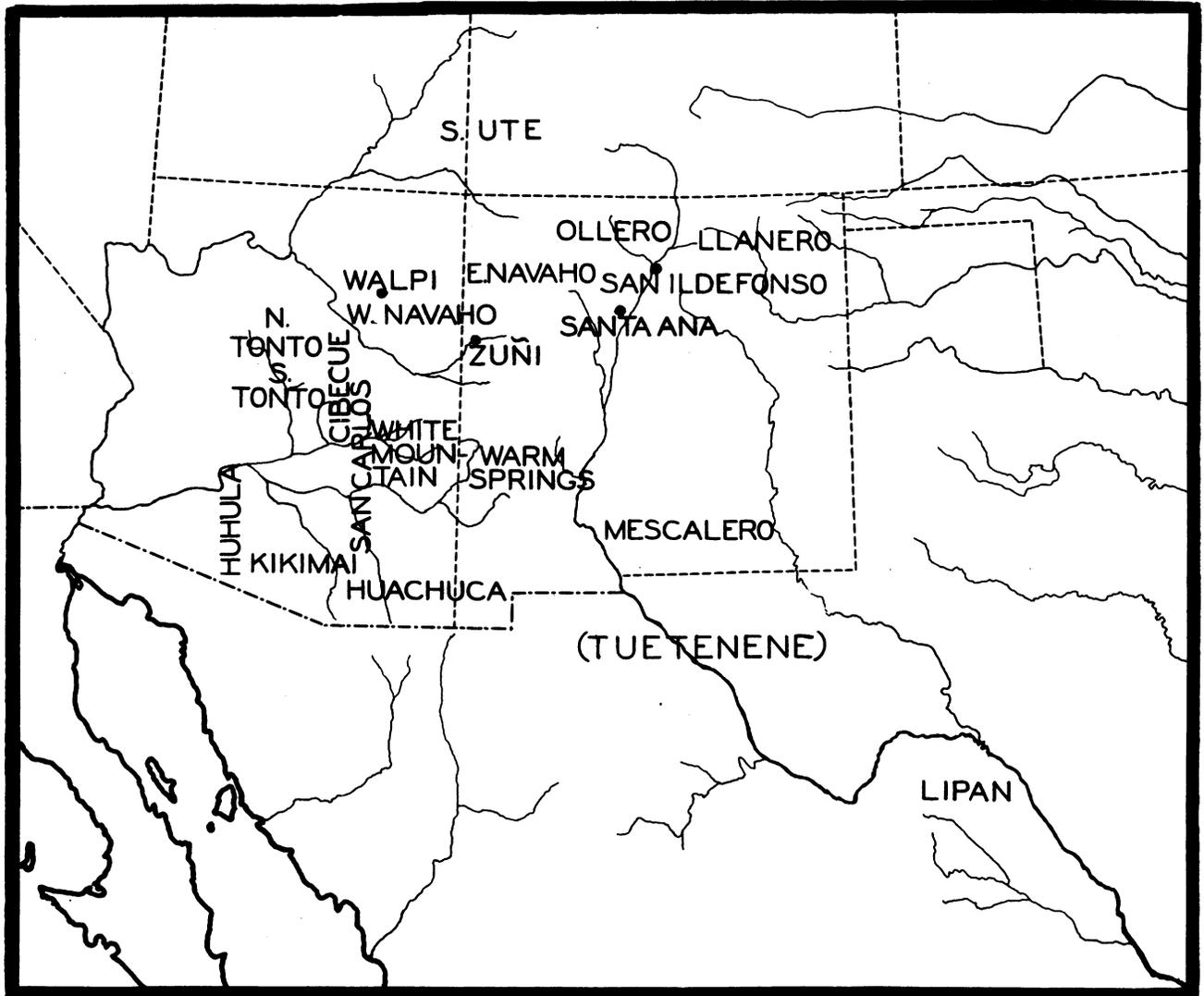
## PREFACE

The material for this paper was collected from July to November, 1935, during a leave of absence from regular duties granted by the Regents of the University of California. The expedition involved more than 10,000 miles of motoring. The author was accompanied and assisted by his wife Delila and daughter Phyllis.

The expedition was financed from funds supplied by the Rockefeller Foundation to the Institute of Social Sciences of the University of California.

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Thanks are due to many individuals for their kindly assistance. Brother Claudius Anthony, of St. Mary's College, supplied a letter to various Catholic missionaries. Father Berard Haile gave me the benefit of his criticism of my Navaho lists. Various members of the U.S. Indian Service assisted me greatly. I mention especially Mr. Pigeon at Leupp, Mr. Donner at Whiteriver, Mr. Graves at Dulce, Mr. Hutton at Keam's Canyon, and Mr. Hall at Sells. Father Vincent at San Xavier located an excellent Papago informant and interpreter for me. At Sells Dr. Ruth Underhill gave me the benefit of her extensive knowledge of Papago culture. Mr. Grenville Goodwin collaborated with me in recording the Southern Tonto Apache element list. Mr. Hilario Sanchez, governor of Santa Ana pueblo, kindly permitted work there and aided in getting informants and interpreters. To all of these and many others I owe gratitude for hospitality and for aid in contacting informants and interpreters.



Map 1. Groups investigated.

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## INTRODUCTION

The material presented in this paper is largely Athabascan, 13 out of 20 groups investigated belonging to that linguistic family. The Yuman stock is unrepresented in the material. Of the Piman stock only Papago is represented; while of the numerous Pueblo only 4 were investigated, but these 4 belong to the 4 Puebloan linguistic stocks, viz., Shoshonean, Zunian, Keresan, Tanoan.

Although the Southwest is often referred to in this paper, it should be understood to mean only the Southwest so far as covered by the materials herein.

Western Navaho was the first group worked. Many new elements were encountered as the work proceeded. It was not feasible to return to the groups worked earlier to inquire about these elements, even though such a proceeding would have been desirable. It is regrettable but unavoidable that this fortuitous circumstance enters into the work. Like most scientific works, this one is to be regarded as a report of progress rather than the final word on the subject.

### LOCALIZATION OF LISTS

The region dealt with in each element list is that with which the informant and his group were familiar and regarded as home. This does not gainsay the fact that some of the habitats may be recent. For instance the Western Navaho are living farther west than did the earlier Navaho. The Mescalero are located by Sayles<sup>1</sup> in quite different habitats before and after 1750 than that claimed by my informant as their habitat. However, that does not preclude the Mescalero having adjusted themselves to the environment which the informant claimed was theirs. The habitats of 175 or more years ago have been forgotten by these unhistorically-minded people. The Lipan informant knew traditionally of the earlier habitat, but her data concern that in which she and her fellows were reared. Obviously, the more easterly Athabascans of the Southwest have moved from place to place of their own volition and through Plains Indians and Caucasian pressure. Thus the lists refer to the habitats known to the informants, which may or may not be those of 200 or 500 or 1000 years ago. The ethnographer aims to extract from informants only that which they know, not that with which they are unfamiliar.

In each instance the attempt was made to obtain a list referring to a local group and a limited locality. The local groups or localities (map 1) are as follows:

Western Navaho, WN, Little Colorado r., upstream from Leupp, Arizona.  
Eastern Navaho, EN, vicinity of Tohatchi, New Mexico.

Northern Tonto Apache, NT, Fossil Cr. band.<sup>2</sup>  
Southern Tonto Apache, ST, 6th semiband.  
San Carlos Apache, SC, Pinal band.  
Cibecue Apache, Ci, Cibecue band.  
White Mountain Apache, WM, E White Mt. band.  
Warm Springs Apache, WS, Alamosa and San Francisco rs., New Mexico. List gives culture of Chokalene and Chihene bands which lived together.  
Huachuca Mountains Apache, Hu, in mt. range of that name in S Arizona. Native name of band Shaiahene. Chokalene, Chihene, Shaiahene, and a 4th band (Indendai) unrepresented in element list constitute the Chiricahua Apache of other writers. 1st, 2d, and 4th are recognized by Opler (Castetter and Opler, p. 6), but not the Shaiahene.

Mescalero Apache, Me, central Mescalero or Ni'ahane band. Sierra Blanca, Capitan, Sacramento, and Guadalupe mts., central New Mexico and adjoining Texas. For discussion of WS, Hu, and Me see Notes on Habitats, also Castetter and Opler.

Lipan, Li, W Lipan or Tuensane band. Vicinity of Eagle Pass, Texas, and Piedras Negras, Coahuila.

Llanero, Ll, Jicarilla Apache division, vicinity of Cimarron, New Mexico.

Ollero, Ol, Jicarilla Apache division, Rio Chama, New Mexico.

Southern Ute, SU, a band called Wemenuis, living in vicinity of La Sal mts., SE Utah.

Walpi, Wa, Zuni, Zu, Santa Ana, SA, and San Ildefonso, SI, are pueblos whose locations are well known, Walpi being a Hopi pueblo in NE Arizona, Zuni a pueblo on the Zuni r. in W New Mexico, and Santa Ana and San Ildefonso being Keresan and Tanoan pueblos respectively, on the Rio Grande in N New Mexico.

Kikimai Papago, KP, a local Papago group in S Arizona.<sup>3</sup>

Huhula Papago, HP, westernmost Papago group except for the Sand Papago.<sup>3</sup>

<sup>1</sup>1935, p. 26.

<sup>2</sup>For location of W Apache groups, see Goodwin, p. 56.

<sup>3</sup>See maps 1 and 2.

## EVALUATION OF LISTS

With the exception of the San Ildefonso list all were obtained with the aid of interpreters. Four successive and not very satisfactory interpreters were utilized in recording the Western Navaho list, which has no doubt suffered in consequence. Two interpreters and two informants were used at Zuni and at Santa Ana. The incomplete Huhula Papago list was obtained from two informants. In some instances a single interpreter was used for more than one list, which doubtless was a desirable proceeding, since the interpreter became more efficient with the second and subsequent lists. Such lists are Northern and Southern Tonto Apache; Cibecue and White Mountain Apache; Warm Springs, Huachuca, Mescalero, and Lipan Apache; Llanero and Ollero Jicarilla Apache.

The evaluation of the lists in grades A (excellent), B (good), C (fair) by the recorder and the number of hours spent in their recording are as follows: Western Navaho, C, 31 hours; Eastern Navaho, A, 37; Northern Tonto Apache, A, 37; Southern Tonto Apache, A, 41; San Carlos Apache, A, 47; Cibecue Apache, A, 32; White Mountain Apache, B, 47; Warm Springs Apache, B, 48; Huachuca Mountains Apache, A, 38; Mescalero Apache, A, 46; Lipan, A, 25; Llanero Apache, B, 24; Ollero Apache, B, 30; Southern Ute, A, 31; Walpi, A, 31; Zuni, A, 42; Santa Ana, B, 36; San Ildefonso, A, 32; Kikimai Papago, A, 57; Huhula Papago, B, 18 (incomplete).

The Southern Tonto list had the benefit of the collaboration of Mr. Grenville Goodwin in its recording. During the six preceding years he had spent much time studying the Western Apache. In spite of this fact, use of the element list brought forth among the Southern Tonto sixty-four elements which he had not recorded among any Western Apache. This would seem to bespeak the efficacy of the element-list method of investigation. Mr. Goodwin also kindly entered 1478 White Mt. Apache elements from memory. These, however, were not localized for either Eastern or Western bands and are, in consequence, not published here. The White Mt. Apache list beyond was recorded by the author for the Eastern band.

## INFORMANTS

Western Navaho.—Haschinisüsü (Small Man), a blind shaman, ca. 80 yrs. old. Born near Little Colorado r., 12 mi. upstream from Leupp, Arizona. Just before his birth his parents moved to this place from ca. 30 mi. N of Oraibi, because of crowded conditions there and the fact that relatives were already living on Little Colorado. Informant 6 or 8 yrs. old when Navaho taken to Ft. Sumner in 1863. He declined to discuss death customs; but information obtained from 19-year-old interpreter. Interpreters: Maxwell Yozzie, Reid Jensen, Felix Baldwin, Stephen N. Jackson. Informant interviewed near Leupp, Arizona.

Eastern Navaho.—John Bowman, ca. 66 yrs. Both parents Navaho: father of tohani clan, mother of kuduchin clan. Informant of latter clan. Born 1869 near Tohatchi, New Mexico. Lived in that region till 1891, when joined army. His mother died while he was a small boy. He herded sheep in boyhood, but sheep not nearly so numerous then as now. Interpreter, Sidney Philips, who also served Drs. P. E. Goddard and Gladys Reichard. Informant interviewed at Shiprock, New Mexico.

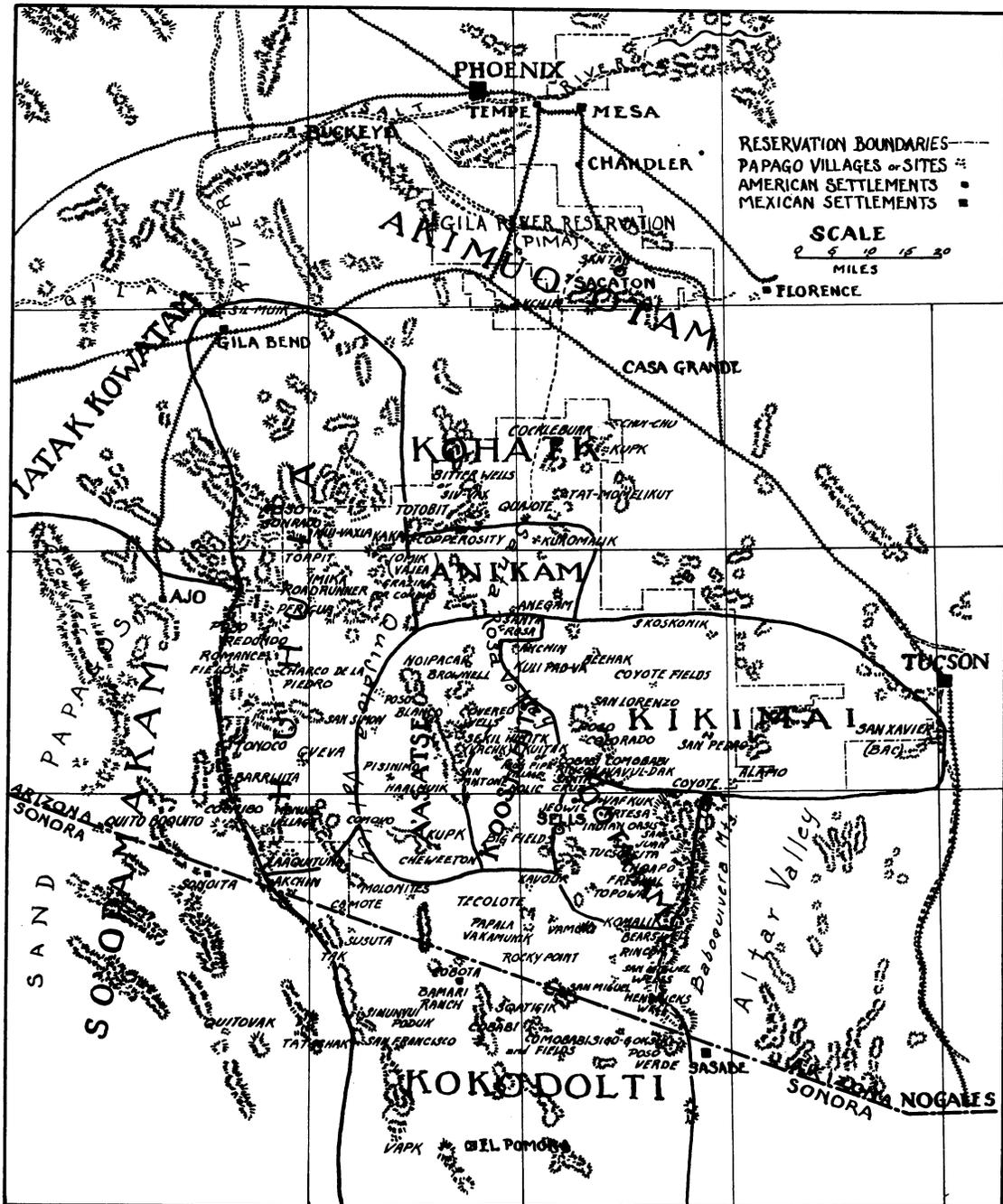
Northern Tonto.—Tonto Joe; of Fossil Creek band; born ca. 1856 in Strawberry v.; lived there till ca. 17 yrs. old. Data relate to Strawberry v. semiband. Informant's wife from Bald Mt. band of Northern Tonto. He did not want to discuss shamanism. Interpreter: Fred Casey. Informant interviewed at Camp Verde, Arizona.

Southern Tonto.—Henry Irving, probably ca. 82 because ca. 20 when peace made at Camp Verde (1873). Did not see "stars fall" in 1833, but his father did. Camp a bit N of confluence of Rye and Tonto crs. was his birthplace, but lived mostly at Ligaishak, his 'parents' home, at foot of Mogolom rim, where his father had farm. Data refer to Ligaishak, in territory of 6th semiband of Southern Tonto. Informant reticent about celestial and religious matters. Interpreter: Fred Casey. Informant interviewed at Payson, Arizona.

San Carlos Apache.—Charlie Dustin, of Pinal band like both parents. Served with Capt. Crawford in capturing Geronimo. Was ca. 25 yrs. old then. Was born at Pinal on ridge about 12 mi. SE of Miami. Informant's clan besün (yellow), father's clan hakaye (hump-back mt., near Roosevelt). Informant apparently not conversant with shamanistic matters. All data refer to Pinal band. Interpreter: Morgan Toprock. Informant interviewed at Rice, Arizona.

Cibecue Apache.—Toggie Nightjar, of Cibecue Cr. band. Born ca. 1861. Father of Cibecue band; mother of Carrizo Cr. band. Birthplace, Sikaideska (white mt. sticks out) on Cibecue cr., 3 or 4 mi. below store at Cibecue. His parents moved around and lived up in hills a good deal. Also moved back and forth to Carrizo cr. His mother had farm on Carrizo cr., father on Cibecue cr. Informant married at White r. after Ft. Apache founded. Informant very poor on basketry. Interpreter: Thomas Riley. Informant interviewed at Whiteriver, Arizona.

Eastern band of White Mountain Apache.—Charlie Shipp, ca. 75 yrs. old. Born at Warm Springs (tusisil) near Ash cr., ca. 25 mi. E of San Carlos. Father from Ft. Apache, mother from Cedar cr., ca. 15 mi. NW of Ft. Apache. Lived in Ash Flat region for a time, but normally his family moved back and forth from ca. 10 mi. S of Black r. to White r. near Yangokai, the modern village near Ft. Apache. Went to Black r. for seed in spring. Moved back to White r. in summer. White r. (near Ft. Apache) was regarded as home. Little Johnnie, another and older informant, ditto; one of Dr. Goddard's in-



Map 2. Papago and Pima (Akimuo'otam, Kohatk) groups. Based on map by J. W. Hoover, AA 37:260; group boundaries and names added.)

formants. I consulted him on a few doubtful points only. He belonged to iyahaya clan, but to same band as Charlie. He was ca. 13 yrs. old when Charlie was born. Interpreter: Thomas Riley. Informants interviewed at Whiteriver, Arizona.

Warm Springs Apache.—Roger Toklanni, born at Inatahachai (Mescal mt.) NW of Ojo Caliente, New Mexico. Father of Chokalene band; mother of Inde<sup>n</sup>dai band; informant of Chokalene band. Mangas Colorado, of Chokalene band, was headman of informant's group, which made up of Chokalene and Chihene bands. Both Roger and his wife are of this group. (Geronimo was of different group.) His wife's band was Chihene. Her stepfather, chief of Chihene, died at Ft. Sill, Oklahoma. Inde<sup>n</sup>dai was southwesternmost band of Warm Springs Apache, living in northern Mexico. Each of these 3 Warm Springs bands had separate chief. Each had separate land originally. Age of informant alleged 80. He left Warm Springs country in 1877. He was young man then, already married. In 1880 he was aged 26, when taken to San Carlos reservation. His father's father was Mangas Colorado. Interpreter: Percy Bigmouth. Informant interviewed at Mescalero, New Mexico.

Huachuca Mts. Apache.—Jewett Chinoze, more than 70 yrs. of age. Formerly lived at Chihe in Huachuca mts., Arizona, near Ft. Huachuca. Band called Shaiahene. Father of Chihene band; mother of Shaiahene band. Father killed by Mexicans while informant a baby. Informant ca. 25 when Geronimo taken in 1886. Informant's wife (1935) was Chokalene from Mangas mts. and Ojo Caliente regions. She had never been in Huachuca mts. Interpreter: Percy Bigmouth. Informant interviewed at Mescalero, New Mexico.

Mescalero Apache.—Piganzi, of Ni'ahane band. His father was Ni'ahane, his mother was Zitachisene (Blue mt. people) from Chihuahua. Zitachisene got rations from Mexicans at Chihuahua City. Although still Apache, they wore sombreros and trousers of white material; spoke some Spanish. Informant ca. 21 yrs. old when Mescalero reservation founded in 1875. Interpreter: Percy Bigmouth. Informant interviewed at Mescalero, New Mexico.

Lipan Apache.—Stella La Paz or Yeyu, ca. 75 yrs. old, born in Terrell co., Texas. Her mother and maternal grandmother formerly lived near Texas coast around Houston and Galveston; driven W by whites. When informant ca. 13, Lipan spent year and a half in Oklahoma, where received rations. Interpreter: Percy Bigmouth. Informant interviewed at Mescalero, New Mexico.

Llanero Apache.—Paul Jones. Spent boyhood in

vicinity of Cimarron, New Mexico, before whites there. He was ca. 15 yrs. old when Llanero went to Mescalero reservation to live. Both parents were Llanero (Gusgayi). Interpreter: Norman TeCube. Informant interviewed at Dulce, New Mexico.

Ollero Apache.—Mihlse TeCube, man more than 70 yrs. old. Born 2 or 3 mi. above Chamita, on Rio Chama, New Mexico. Both parents Ollero (Setide). Until 14 lived there, then moved to Tierra Amarilla because rations and agency there. Interpreter: Norman TeCube. Informant interviewed at Dulce, New Mexico.

Southern Ute.—Yagapue, and his wife, Ita. Both ca. 80; of Wemenuis band; already married when saw first white man. Would not discuss war. Interpreter: Herbert Stacker. Informants interviewed at Towaoc, Colorado.

Walpi.—Honi, a man. Born in 1863. Both parents from Walpi. Interpreter: Irving Pabanale (standing flower), Tewa.

Zuni.—(1) Zuni, aged blind man. (2) Lena Zuni, wife of Zuni. Interpreters: Flora Zuni Romancito, Andrew Romancito.

Santa Ana.—(1) Jose Maria Loreto, age more than 90. Both parents Santa Ana. Interpreter: Porfirio Montoya. (2) Nazario Trujillo, grandfather of 1935 governor, Hilario Sanchez. Informant (1) hunted buffalo, (2) did not. Work with (1) ceased because daughter objected. Alternate interpreter, Jose Sanchez.

San Ildefonso.—Ignacio Aguilar, cacique of San Ildefonso. Age 80. Both parents San Ildefonso. No interpreter.

Kikimai Papago.—Jose Santos. Age given 58; looked much older. Lived at San Xavier 32 yrs. Born at Akchin in Kikimai territory; both parents Akchin people. Informant and father of maamkam clan, mother of apkikam clan. Informant continually wanted to relate mythical origin of each thing, tobacco, ax, etc. Informant an ammalist; possessed carved-stick record for "92" yrs. (from 1935 back); published by Underhill, 1938. Interpreter: Frank J. Rios. Informant interviewed at San Xavier, Arizona.

Huhula Papago.—Old Ramon, a male shaman of maamkam clan, more than 80 yrs. old. Both parents Huhula. Because of local interference, work with him was abandoned and Jim Anes, a Huhula man in late forties, was interviewed. He belonged to apapikam clan of coyote or white moiety; born at Imika; both parents from Kaka. Lived at Imika till young man. Interpreter: Louis Valdez. Informants interviewed at Gila Bend, Arizona.

# CULTURE ELEMENT DISTRIBUTIONS LIST

## SYMBOLS USED IN THE ELEMENT LIST

In the presentation of elements the following symbols are used: +, present; (+), probably present; -, absent; (-), probably absent; S, sometimes present; M, modern; I, imported; ?, inquired about but no satisfactory answer; blank, no inquiry made. M, modern, has been used only where the informant so stated. When an informant insisted a trait was ancient, even though I was certain he was wrong, I entered a +, not an M. Thus M in the list reflects the informant's

opinion. Abbreviations for group names are as given in preceding section, "Localization of Lists."

The double dagger (‡) has only a statistical reference. It indicates that the element has been broken into two or more elements for purposes of computation. Compare UC-AR 1:60.

All data were recorded in the field. Nothing whatsoever has been added from the literature.

ELEMENTS	OCCURRENCE																			
	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
<b>HUNTING</b>																				
<u>Individual (or Small-Group) Hunting</u>																				
1. Stalking . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
2. Deer-mask decoy . . . . .	+	-	+	+	+	+	-	+	+	+	+	+	-	+	-	+	+	-	+	+
3. Antelope-mask decoy . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	-	+	-	+	+	-	+	+
4. Buffalo-mask decoy . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. With hide . . . . .	+	-	+	-	+	+	+	+	+	+	+	-	+	+	S	S	-	-	-	-
6. With fabric or painted material . . . . .		+	+	+	-	-	-	-	M	-	S	-	-	-	-	+	+	-	-	-
7. Stick "legs" . . . . .	+	+	+	+	-	+	-	+	+	+	-	+	-	+	-	+	S	-	-	-
8. Bow and arrows as "legs" . . . . .			+				+						-			+	-	+		
9. Arms painted (antelope hunting) . . . . .		+				+							-				-			
10. Stations on trail . . . . .	+	+	+	+	+	+	-	-	+	+	+	+	-	+	+	-	+	+	+	+
11. Game calls to decoy . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+
12. With leaf in mouth . . . . .		+								+		+				-	+	+	+	
13. With tubular whistle . . . . .		+									+			+		+				
14. Turkey or quail . . . . .		+												-	-	+	+	+	+	-
15. Deer . . . . .	-	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	-
16. Antelope . . . . .	+	-	-	-	-	-	-	+	-	+	+	+	-	+	+	+	S	+	-	+
17. Buffalo . . . . .		-								-	-	+	-	-	-	-	-	+	-	-
18. Rabbits . . . . .	+	+	+	+	-	+	+	-	-	-	S	+	-	+	-	-	+	+	+	+
Running down (wearing out):																				
19. Deer . . . . .	+	+	+	+	+	+	+	+	+	+	-	-	-	+	+	+	+	+	-	-
20. Elk . . . . .	+	-					+	+	-	+	-	-	-	-	-	?	-	-	-	-
21. Bear . . . . .		-					+	-	-	-	-	-	-	-	-	-	+	+	-	-
22. Other large game . . . . .	+	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	+	-	-	-
23. Rabbits in snow . . . . .	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	-	+	+	-	-
24. Quail (wet) . . . . .	+	-	-	-	+	-	-	+	+	-	-	+	-	+	-	-	+	-	-	-
25. Deadfall, for rodents, etc. . . . .	+	+	+	+	+	+	+	-	-	-	-	+	-	-	+	+	-	+	-	-
26. Medium-sized game . . . . .	-	+	+	+	+	+	-	-	-	-	-	-	-	-	+	+	-	+	-	+
27. Deer's legs broken by rolling logs . . . . .															-		+			-
28. Trigger-bar trap . . . . .		+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-
29. Baited trigger . . . . .	+	+	+	+	+	S	-	-	-	-	-	+	-	-	+	+	-	+	-	+
30. Stone weight . . . . .	+	+	+	+	+	+	+	-	-	-	-	+	-	-	+	+	-	+	-	+
31. Log . . . . .	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-
32. Stone side walls, collapsible . . . . .			+	+	+	+										+		+		+
33. Cage trap . . . . .	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-
34. Pit trap, sprung by watcher . . . . .															+					
35. Pit trap, sprung by quarry . . . . .																				+

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
36. Nets for game . . . . .	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
37. Rabbits . . . . .	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
38. Bag or pocket shape . . . . .	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
39. Pitfall . . . . .	+	+	-	S	-	+	-	-	-	-	-	+	-	-	+	+	-	+	-	-
40. For deer . . . . .	+	+	-	+	-	+	-	-	-	-	-	+	-	-	+	+	-	+	-	-
41. Stick-covered . . . . .	+	+	-	+	-	+	-	-	-	-	-	+	-	-	+	+	-	+	-	-
42. Straddling bar . . . . .		+				+		-	-	-	-	-	-	-	S	+	-	-	-	-
43. Impaling stakes . . . . .	+		-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
44. Depth 6-9 ft. . . . .	+	+	-	+	-	?	-	-	-	-	-	+	-	-	+	+	-	+	-	-
45. On trails . . . . .	+	+	-	+	-	+	-	-	-	-	-	+	-	-	+	+	-	+	-	-
46. In "gates" (opening) . . . . .	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-
47. Behind fence to jump . . . . .	S	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	?	-	-
48. In series . . . . .	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-
Rodents, etc., in burrows and nests:																				
49. Smudged out . . . . .	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	-	+
50. Flooded out . . . . .	+	+	-	-	-	+	-	+	+	+	+	+	M	+	+	+	+	+	-	+
51. Holes filled with dirt to make animal dig out . . . . .																				
52. Stick twisted in fur . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
53. Wetted stick . . . . .	+	+	+	+	+	+	+	+	+	-	-	+	-	+	+	+	+	+	-	-
54. Saliva . . . . .			+	+								+					+	+		
55. Split stick . . . . .	-	-	-	-	-	-	-	-	+	-	+	S	+	-	-	-	+	-	-	-
56. Rough stick . . . . .		+								+	+	+	-	+	+	-	+	+	+	+
57. Hunter chewed end . . . . .												+								
58. Notched stick . . . . .	-	-	+	-	+	+	+	+	+	-	+	S	-	+	+	-	-	+	-	-
59. Hooked stick . . . . .	-	-	-	-	-	-	-	-	-	+	+	S	-	-	+	-	+	+	-	-
60. Prodded out of nest . . . . .	-	-	+	+	+	+	+	+	+	+	+	S	-	+	-	+	+	+	+	+
61. Nest burned . . . . .	-	-	-	S	S	-	+	S	S	S	-	-	-	-	+	S	+	-	-	+
62. Special wood-rat arrows (nos. 1110, 1111) . . . . .															+	+	-	-	+	+
Special devices for prairie dogs:																				
63. Broad-barbed arrow . . . . .														+	+	-	-	-	-	-
64. Crossed arrow . . . . .	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
65. Single-hook arrow . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
66. Blowing into burrow of desert rat . . . . .																				+
67. Flares for geese . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
68. For quail . . . . .	-	-	-	-	+	+	+	-	+	-	-	-	-	-	-	-	-	-	+	+
69. For turkeys . . . . .		+							+	+	+	+	-	-	-	+	+	+	-	-
70. For various birds . . . . .	-	-	+	-	+	+	+	-	+	-	-	-	-	-	-	-	-	-	+	+
Snares:																				
71. Self snares . . . . .	+	+	-	-	-	-	-	-	+	+	+	+	-	-	+	+	+	+	-	+
72. On sinking perch . . . . .																+		+		
73. In circular fence . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-
74. In water . . . . .																+		+		
75. Notched-stone sinker . . . . .																				+
76. On spring pole, sus- pending quarry . . . . .	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
77. Stick weight to draw shut . . . . .		+																		
78. With hollow sunflower stalk for birds (EDN, p. 323) . . . . .	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	+	-	-
79. Stone weight to draw shut . . . . .															-	+	-	-	-	-
80. Bent stick to draw shut . . . . .	+																		+	
81. Of rope, for deer, etc. . . . .	+	+	-	-	-	-	-	-	-	M	-	+	-	-	+	-	+	-	-	-
82. For eagles . . . . .	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
83. For other birds . . . . .	+	+	-	-	-	-	-	-	+	+	+	+	-	-	+	+	-	+	-	-
84. For small game . . . . .	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
85. Drawn by hunter . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
86. Snare on stick . . . . .	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	+	-	-
87. For fish . . . . .	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	+	-	-
88. Booths, blinds: of brush . . . . .	-	-	-	-	-	-	-	-	-	+	+	S	-	+	-	+	+	+	+	-
89. Of rock . . . . .	S	-	+	S	+	+	+	-	-	+	-	-	-	+	-	-	+	+	?	-
90. For mt. sheep . . . . .	-	-	-	-	+	-	?	-	-	+	-	-	-	+	-	-	-	+	?	-
91. For deer . . . . .	+	+	+	+	+	+	+	-	-	+	+	-	-	-	-	-	+	+	-	-
92. Others . . . . .	+	-	-	-	-	+	-	-	-	+	+	-	-	+	-	+	+	+	-	-
93. Covered pit . . . . .	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
94. Brush hut instead . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-
95. For eagles . . . . .	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	+	+	-	-	-
96. Pulled in . . . . .	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	+	+	-	-	-
97. Taken alive . . . . .	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	+	+	-	-	-
98. Killed subsequently . . . . .	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	+	+	-	-	-
99. Dead-rabbit decoy . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
100. Dummy-rabbit decoy . . . . .	-	-	-	-	-	-	-	-	-	-	-	S	-	-	-	-	-	-	-	-
101. Live-rabbit decoy . . . . .	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
102. Other live decoys . . . . .	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-
<u>Communal Hunting</u>																				
103. Hunt master (1) . . . . .	+	+	+	+	+	+	+	+	+	+	+	-	-	+	-	-	-	+	+	-
104. Hunt masters (2) . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	+
105. Surround by people in circle . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
106. Deer . . . . .	+	+	+	+	-	+	+	S	-	-	-	S	-	+	+	+	+	+	+	+
107. Rabbits . . . . .	+	+	+	+	-	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+
108. Antelope . . . . .	+	+	+	S	-	-	-	+	-	-	-	+	-	+	+	+	+	+	+	+
109. Elk . . . . .	+	-	-	-	-	-	-	-	-	-	-	-	S	-	-	-	-	-	-	-
110. Clubbed . . . . .	+	-	+	+	+	-	+	+	+	+	+	-	+	+	+	+	+	+	+	+
111. Shot . . . . .	+	+	-	-	+	+	+	+	S	S	S	+	S	+	+	+	+	+	+	+
112. Driving: into corral, etc. (see fig. in Notes) . . . . .	+	+	+	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-
113. Of branches . . . . .	+	+	+	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-
114. Funnel approach . . . . .	+	+	+	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-
115. Over cliff, bank . . . . .	-	-	+	-	-	-	-	-	-	S	-	+	S	+	-	S	-	+	-	-
116. Into dug pit . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
117. Lassoed . . . . .	-	-	-	-	-	-	-	-	S	S	S	S	-	-	M	S	-	-	-	M
118. To hidden hunters . . . . .	+	S	+	+	+	+	+	-	+	+	-	-	-	+	+	S	+	+	+	+
119. With fire . . . . .	-	+	-	+	+	+	+	+	+	+	-	-	-	+	-	+	+	-	+	+
120. With dogs . . . . .	M	-	-	S	-	-	S	+	-	-	-	-	-	-	-	+	+	S	-	+
121. Deer . . . . .	+	+	-	+	+	+	+	+	+	-	-	-	-	+	+	+	+	+	+	+
122. Antelope . . . . .	+	+	+	+	-	-	-	+	+	+	-	-	-	+	+	-	-	-	-	+
123. Peccary . . . . .	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+
124. Buffalo . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	+	-	-
125. Carnivore calls by hunters . . . . .	+	-	+	-	-	+	-	-	-	-	-	-	-	-	+	+	-	-	-	-
<u>Dogs</u>																				
126. Dogs . . . . .	+	+	S	S	S	S	S	S	-	+	-	+	+	-	+	+	+	+	-	+
127. Trained . . . . .	S	+	+	+	+	?	+	+	-	+	-	-	-	-	+	+	+	+	-	+
128. Used by individual hunter . . . . .	S	+	+	+	+	+	+	+	-	+	-	-	+	-	+	+	+	+	-	+
129. Running down wounded animals . . . . .	+	+	+	+	+	+	+	+	-	+	-	-	+	-	-	+	+	+	-	+
130. Flushing quail to trees . . . . .	-	+	-	+	-	?	-	-	+	-	-	-	-	-	-	-	-	+	-	+

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
131. Rabbit catching . . . . .	+	-	+		+	+	+	+	-	+	-	-	S	-	+	+	+	+	-	+
132. Squirrel catching . . . . .		-	+		+	+	?	+	-	+	-	-	-	-	+	+	+	+	-	-
133. As watch dog. . . . .									-	+	-	+		-						-
<u>Religious Preparations for Hunt</u>																				
134. Individual sings before hunt . .	-	+	+	+	+	+	-	+	+	+	+	+	-	-		+		+	+	+
135. Singing rite before hunt . . . .	+	+	+	+	+	+	+	+	+	+	+	-	-	-		+		+	+	+
136. Musical instrument (drum)	-	-	-	-	-	-	-	+	-	-	-	-	-	-		-		-	-	-
137. Prayer for good luck . . . . .	+	+			+	+						+	+	-		+		+	+	+
138. Pray to goddess . . . . .						+		+	-	?	-	-	-	-		-		-	-	-
139. Pray to god . . . . .					+	+		+	+	?	+	-	+	-		-		+	+	?
140. 1 night for deer . . . . .	?	+	+	+	-	+	+	+	+	+	+	+	+	-		-		-	+	+
141. 4 nights for deer . . . . .	?	-	-	-	-	-	-	-	-	-	-	-	-	-		+		+	-	-
142. For buffalo . . . . .												+	-	-		-		+	-	-
143. Tobacco smoked . . . . .	-	+	+	+	+	+	+	+	+	+	+	+	+	-		+		+	+	+
144. Cigarette . . . . .		+										+	+	-		+		+	+	+
145. Fasting . . . . .	-	-	+	+	-	-	-	-	-	-	-	-	-	-		-		-	+	-
146. Food restrictions . . . . .	-	-	-	+	-	-	-	-	-	+	-	-	-	-		-		+	+	-
147. Continenence for 1 night . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-		-		-	-	-
148. Continenence for 4 nights . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-		+	-	-
149. Menstruation taboos for hunter . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	-		-	+	-	+	+
150. At home . . . . .	-	-	+	+	-	+	-	-	+	+	+	+	+	-		+		+	-	-
151. In sweat house before hunt . . . . .	+	+	+	+	+	+	+	+	-	-	-	-	-	+		-		-	-	-
152. In corral on way . . . . .	+	+	+	-	-	+	+	+	-	-	-	-	-	-		+	+	-	+	+
153. Night singing in corral . . . . .			+													+			+	+
154. Masked dancers (spirits).								+	-	-	-	-	-	-		-		-	-	-
155. Dance with deer masks (hunters) . . . . .								+	-	-	-	-	-	-		-		-	-	-
156. Individual sings and prays on hunt . . . . .	-	+	-	+	+	-	-	+	-	-	-	-	-	-		+		+	+	-
157. Prays to "gan" to be al- lowed to kill deer . . . . .		+	+	+	+	-	+	+	-	S	-	-	-	-		-		-	-	-
158. Prays to "father" and "mother" of deer ask- ing for "children" . . . . .	+	-		+	-	-	-	-	-	?	-	-	-	-		-		-	-	-
159. Individual smokes and prays on hilltop . . . . .		+				+	+	+	+	-	+	-	-	+		+		+	+	-
160. Prays to deity . . . . .		+				+		+			+	-	-	+		-		-	+	?
161. Prays to Mt. Lion when deer hunt- ing . . . . .		-	+	+		+	+	+	-	?	?	-	-	-		-		+	-	-
162. Prays to Wolf when deer hunting . . . . .		-	+			+	-	+	-	?	-	-	-	-		-		-	-	-
163. Prays to fore- fathers . . . . .																+		-	-	-
164. Meal, pollen, or tur- quoise offerings . . . . .	-	+	-	-	-	+	-	+	-	-	+	+	+	-		+		+	-	-
165. Sleep-inducing powder . . . . .																			+	+
166. Turquoise amulet . . . . .		+				+		+	+	+	+	-	-	-		-		-	-	-
167. Bracelet of stone beads (amulet) . . . . .										+	+		-							
<u>Observances after Kill</u>																				
167a. Hide laid on carcass . . . . .		+	+		+	+	+	+	+	+			+							
168. Animal slain addressed ("prayer") . . . . .	-	+	+	-	+	-	-	-	S	-	+	-	-	+		+	+	+	-	+

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
169. Deity addressed . . . . .	-	+	+	+	-	+	+	+	+	-	-	+	+	+	-	+	+	+	+	-
170. Deer pointed toward hunter's home	+	+	+	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	-	-
171. Deer pointed E . . . . .	-	-	-	-	-	+	+	-	S	+	+	+	+	+	-	+	-	-	-	+
172. Nostrils plugged . . . . .	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+
173. Offering of meal, pollen, or tur- quoise . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-
174. Tobacco smoked . . . . .																+	+			
175. Meat offering to slain- enemy spirit . . . . .																				+
176. Hunters purify . . . . .	+	+	+	-	+	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-
177. Washing for 4 days . . . . .																		+		
178. In sweat house . . . . .	+	+	+	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-
179. Deer covered with blanket at house . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-
180. Necklace on deer at house . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-
181. On other game likewise . . . . .																+	+			
182. Sing for 4 nights after deer killing . . . . .																				+
183. Deer-mask dance after killing . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
184. Special acts for bear . . . . .	+	+	+	?	+	+	+	+	+	-	-	-	+	-	+	+	+	-	-	-
185. Live bear addressed . . . . .				+	+	+	+	+	+	-	-	-	+	-	+	+	+	-	-	+
186. Dead bear addressed . . . . .				+						-	-	-	-	-	+	+	+	-	-	
187. Last antelope released . . . . .	+	+		-	-	-	-	-	-	-	-	-	-	S	-	+	+	-	-	-
188. Other animals released (notes 97, 112) . . . . .	+	-	-	-	-	-	-	+	-	+	-	-	-	-	+	+	+	-	-	-
189. Reincarnation-of-deer belief . . . . .															+					
190. Division of game: killer gets sinew . . . . .	-	-	+	+	-	+	+	-	S	+	-	+	?	+	-	+	+	+	+	+
191. Hide to killer . . . . .	-	-	+	-	?	-	?	?	?	-	?	?	?	+	+	+	+	+	+	+
192. Hide to killer's com- panion . . . . .	+	+	-	+	?	+	?	?	+	+	?	?	?	-	-	-	-	-	-	-
193. Head (including brain) to killer's companion . . . . .	-	+	-	+	?	+	?	?	?	+	?	?	?	+	-	-	-	-	-	-
194. Head (including brain) to killer . . . . .	-	-	+	-	?	-	?	?	?	-	?	?	?	+	+	+	+	+	+	+
195. Spinal cord to man who gets hide . . . . .	-	?	-	+	?	-	?	?	?	?	?	?	?	+	+	+	+	+	+	+
196. Butchering customs: butchered on spot . . . . .	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
197. Carried home whole . . . . .	-	-	+	-	-	S	S	-	-	-	-	-	-	-	-	-	-	-	-	S
198. Skinned lying . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
199. On branches . . . . .	+	-				+		+						+	+					+
200. On cleared ground . . . . .	-	+				-		-						-	-					-
201. Skinned hanging . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
202. Carried home in hide . . . . .	+	-	-	-	-	+	-	S	S	-	-	+	-	-	S	+	S	+	+	+
203. Roped into bundles . . . . .	S	+	-	+	+	+	+	S	+	+	+	-	+	+	+	+	+	+	-	S
204. Blood drunk fresh by hunter . . . . .	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	+	-	-
205. Liver, etc., eaten raw on spot . . . . .	-	-	-	+	-	-	-	+	+	+	+	S	-	+	+	S	+	+	-	-
206. Liver, etc., eaten cooked on spot . . . . .		+		-	+	S	-	-	-	-	S	-	+	-	-	+	-	S	+	+
207. Milk from doe's udders drunk . . . . .															-	+	+	+	-	-
208. Boy does not eat 1st kill . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	?	+	+
209. First 4 kills . . . . .			+																	+
210. Parents also do not eat 1st kill . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	?	+	-
<u>Animals not Eaten</u>																				
211. Bear . . . . .	+	+	-	S	-	-	-	+	+	-	-	+	+	-	-	-	-	-	+	+
212. Mt. lion . . . . .	+	-	-	-	?	S	+	-	-	-	-	-	-	+	-	-	+	-	+	-
213. Wildcat . . . . .	-								+	+	+	+	+		+	+	+			-
214. Wolf . . . . .		+							+	+	+	+	+	+	?	+	+	-	+	+
215. Coyote . . . . .		+		-	-				+	+	+	+	+	+	-	+	+	+	-	+



	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
GATHERING																				
257. Hardwood digging-stick for bulbs, roots, etc. . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
258. Pointed . . . . .		+				-		+	-					-						
259. Chisel-bladed . . . . .						+		+						+						
260. 1½-3 ft. long, 1-2 in. thick . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
261. Driven with cobble . . . . .		+					S S	-	+	S	S	S	S	-	S	S	-	-	-	-
262. Chisel-bladed mescal-root cutter, cobble driven . . . . .	-	-	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	+	+
263. Special knife for mescal trimming (nos. 953-955). . . . .	-	-	+	+	+	+	+	+	+	?	+	-	-	-	-	-	-	-	+	-
264. Long poles: straight, for beating trees . . . . .	S	-	+	+	+	+	+	+	+	+	+	+	-	+	+	-	+	+	+	+
265. Fork-ended . . . . .														+	-	-	-	-	-	-
266. With pt. and "spoon," for impaling pitahaya (no. 348) (see fig. in Notes). . . . .	-	-	-	-	-	-	-	-	?	-	?	-	-	-	-	-	-	-	+	+
267. Diagonal crosspiece (for saguaro) (see fig. in Notes) . . . . .	-	-	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	+	+
268. U end (crook) . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-
269. Hooked end (acute angle). . . . .			-	-	+	+	-	+	+	+	+	-	-	-	-	-	+	+	-	-
270. For branch shaking (or bending) . . . . .			-	-				-		+	+	-	-	-	-	-	+	+	-	-
271. For saguaro . . . . .			-	-	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-
272. Same name for all . . . . .	-	-	-	-	+	+	-	+	-	+	+	-	-	-	+	-	+	+	-	-
273. Thrown stick, for nuts . . . . .								+			+			+						
274. Cactus fruit: bent stick tongs . . . . .	-	-	+	+	+	+	+	+	+	+	+	-	-	-	+	-	-	-	-	-
275. 2 sticks tied together at handle . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+
276. Split stick . . . . .	-	+	-	-	-	-	-	+	S	-	-	+	-	-	S	+	-	+	-	-
277. 2 sticks not tied together. . . . .	-	-	-	-	-	-	-	+	S	S	-	-	-	-	-	S	-	-	-	-
278. Fork of branches . . . . .	+	-	-	-	-	-	-	-	S	-	-	-	-	+	-	-	+	-	-	-
279. Spines brushed off fruit . . . . .	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
279a. Spines singed off . . . . .	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+
280. Seed beater (no. 1625) . . . . .	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-
281. 3 sticks only . . . . .								+	+	-	-	-	-	-	-	-	-	-	+	-
Seed receiver, carrier:																				
282. Blanket or rawhide to collect seeds on . . . . .	+	+								+	-	+	-	-	+	-	-	-	-	-
283. Burden basket . . . . .	+	+	+	+	+	+	+	+	+	-	-	-	-	+	-	+	-	-	+	+
286. Woven-cloth sack to carry . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	M
287. Skin sack to carry . . . . .	+	+	+	+	+	+	+	+	+	+	-	+	+	+	-	S	-	-	+	S
288. Rawhide "basket," 2 U-sticks outside . . . . .		-												+	-	-	-	-	-	-
FOOD PREPARATION AND STORAGE																				
<u>Acorns</u>																				
289. Acorns roasted on coals . . . . .	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-
290. Eaten raw without grinding . . . . .		-			+					S	-	-	-	-	+	-	-	+	+	+
291. Boiled like beans . . . . .	-	-	-	+	-	-	-	-	-	+	+	-	-	-	-	+	+	-	-	-

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
292. Parched in wooden or pottery bowl, or basket . . . . .	-	-	-	-	-	-	-	-	-	+	+	-	-	-	S	-	+	-	-	-
293. Shelled on metate . . . . .	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	+	-	+	-
294. Ground on metate . . . . .	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	+	-	S	-
295. Ground in rawhide mortar . . . . .	-	-	-	-	-	-	-	-	-	S	S	-	-	-	-	-	-	-	-	-
296. Ground in stone mortar . . . . .	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	S	-	-	-
297. Acorn bread . . . . .	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
298. Meal boiled as soup . . . . .	-	-	+	+	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-
299. Meal in meat stew . . . . .	-	-	+	+	+	+	+	+	+	-	+	-	-	-	-	-	-	-	-	-
300. Uncooked meal eaten with meat stew . . . . .	-	-	+	-	+	+	+	+	+	S	S	-	-	-	-	-	-	-	-	-
301. Stored in basket . . . . .	-	-	+	+	+	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-
302. Stored in pot . . . . .	-	-	+	+	-	+	+	+	+	-	S	-	-	-	-	+	-	-	+	-
303. Stored in skin bag . . . . .	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-
<u>Mesquite</u>																				
304. Pods pounded in stone mortar . . . . .	-	-	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	+	+
305. Pods pounded in hide mortar . . . . .	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	+	-
306. Pods ground on metate . . . . .	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
307. Seeds thrown away . . . . .	-	-	+	+	+	+	+	+	-	+	-	-	-	-	-	-	-	-	+	-
308. Pod flour soaked, juice drunk . . . . .	-	-	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	+	+
309. Pod flour boiled, juice drunk . . . . .	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	+	S
310. Caked for storage . . . . .	-	-	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	+	+
311. Eaten as mush . . . . .	+	-	-	+	-	+	+	-	+	+	+	-	-	-	-	-	-	-	+	-
312. Mesquite-pitch chewing gum . . . . .	-	-	-	-	+	-	+	-	-	-	S	-	-	-	-	-	-	-	+	+
<u>Screw Bean</u>																				
313. Cured in pit . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
314. Pounded with seeds . . . . .	-	-	-	-	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-	+
315. Seeds extracted and discarded . . . . .	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-
316. Eaten like mesquite . . . . .	-	-	-	-	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-	+
<u>Mescal or Agave</u>																				
317. Heads (butts) pit-roasted . . . . .	-	-	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	+	+
318. Marked by owners . . . . .	-	-	+	+	+	+	+	-	+	-	+	-	-	-	-	-	-	-	+	-
319. Place in pit marked . . . . .	-	-	-	-	(+)	-	-	+	-	+	+	-	-	-	-	-	-	-	-	+
320. Buffalo shoulder-blade shovel . . . . .	-	-	-	-	-	-	-	-	-	+	S	-	-	-	-	-	-	-	-	-
321. Fire lit by summer-born person . . . . .	-	-	+	+	-	+	+	S	-	+	+	-	-	-	-	-	-	-	-	-
322. Fire lit by lucky person . . . . .	-	-	-	-	+	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-
323. Sex intercourse taboo during cooking . . . . .	-	-	+	+	+	?	+	-	-	-	-	-	-	-	-	-	-	-	+	+
324. Scratching-stick used during cooking . . . . .	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
325. Cooked heads and leaf bases pounded . . . . .	-	-	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	+	+
326. Drying frames for cooked mescal . . . . .	-	-	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	+	+
327. Stored in dried pads . . . . .	-	-	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	+	+
328. Pads folded . . . . .	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-
329. Stalk (above butt) eaten . . . . .	-	-	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	+	+
330. "Syrup" from flowers . . . . .	-	-	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-
<u>Yucca</u>																				
331. Spanish bayonet: fruit eaten . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
332. Cooked in coals . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	S	-	S	-
333. Fruit dried and stored after seeds discarded . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+



	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP	
373a. Walnuts . . . . .	-					+	+	+	+	+	+	-	-	-	-	-	-	-	-	+	-
374. Skin pounded off with stick in hole . . . . .	-					+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-
375. Washed . . . . .	-					+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-
376. Pulverized walnut with mescal . .	-					+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-
<u>Wild Plums and Cherries</u>																					
377. Eaten raw (+ = both) . . . . .	-	C	-	-	-	-	-	+	-	+	P	+	+	+	-	C	+	+	C	-	-
378. Eaten boiled . . . . .	-	-	-	-	-	-	-	+	-	-	+	+	+	+	-	+	+	+	+	+	-
379. Dried . . . . .	-	-	-	-	-	-	-	+	-	+	+	+	+	-	-	-	+	+	-	-	-
380. Whole chokecherries ground . . .	-	+	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	+	-	-	-
381. "Grass," etc., Seeds . . . . . (Cf. 280-288)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	+	+	+
382. Gathered with seed beater (nos. 280, 281, 1625) . . . . .	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-
383. Gathered with wooden knife . . .	-	-	+	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
384. Gathered with stone knife . . . .	-	-	+	+	+	-	-	-	?	-	-	-	-	-	-	-	-	-	-	-	-
385. Stripped off with hand . . . . .	-	-	+	-	+	-	+	-	S	+	-	-	-	-	-	+	-	-	+	+	-
386. Tops broken off, dried, shaken . .	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	-	-	-	+	+
387. Patches burned to improve . . . .	-	-	+	+	-	-	+	+	+	-	-	-	-	-	-	+	-	-	-	-	-
388. Chia . . . . .	-	-	+	+	+	+	+	+	+	-	?	+	+	-	-	?	?	-	(+)	?	-
389. Gathered with seed beater . . . .	-	-	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
390. With plain stick . . . . .	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-
391. Branches dried, shaken, or rubbed . . . . .	-	-	-	-	-	-	-	+	S	-	-	+	+	-	-	-	-	-	-	+	-
392. Parched in basket . . . . .	-	-	-	-	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	+
393. Parched in pot . . . . .	-	-	-	-	-	-	-	+	-	-	-	+	+	-	-	-	-	-	-	-	+
394. Eaten dry . . . . .	-	-	+	+	+	+	+	-	+	-	-	+	-	-	-	-	-	-	-	-	+
395. Eaten moistened . . . . .	-	-	-	-	-	+	-	+	+	-	-	+	+	-	-	-	-	-	-	-	+
396. Drunk in water . . . . .	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	+
<u>Water Plants</u>																					
397. Tule (cattail, etc.) flower heads eaten young . . . . .	-	-	-	-	+	+	+	+	-	+	-	-	-	S	-	-	-	-	-	-	-
398. Pollen used ceremonially . . . .	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	+	-
399. Shoot tips eaten . . . . .	-	-	S	-	-	-	-	-	+	+	+	-	-	-	-	+	-	-	-	-	-
400. Stem bases eaten . . . . .	-	-	-	-	+	+	+	+	+	+	+	+	-	+	-	+	+	+	-	-	-
<u>Miscellaneous</u>																					
401. Ironwood seeds: parched . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+
402. Greens: eaten raw . . . . .	-	-	-	-	+	+	-	-	-	+	-	-	-	+	-	+	+	-	+	-	-
403. Boiled . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<u>Liquids</u>																					
404. Natural filter in stream bed . . .	S	+	+	+	+	+	+	+	+	+	+	-	-	+	S	+	+	+	-	-	-
405. Snow for drinking and cooking water . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	S	S
406. Barrel-cactus juice, as water substitute . . . . .	-	-	+	-	+	-	+	+	+	-	-	-	-	-	-	-	+	-	+	+	+
407. Cooking in barrel cactus . . . .	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
408. Fruit juices, fresh . . . . .	-	-	+	+	+	+	+	-	+	+	+	+	+	+	+	+	-	-	-	+	+
409. Juices boiled and fermented . . . .	-	M	-	+	+	-	-	+	-	+	-	M	M	M	-	M	-	-	+	+	+

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
410. Saguaro . . . . .	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+
411. At rain festival . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+
412. Mescal after oven cooking . . . . .	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	+	-
413. Mesquite . . . . .	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+
414. Sotol . . . . .	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
415. Maize wine from sprouted grain, pulverized, boiled . . . . .	-	M	-	-	+	M	M	+	-	M	-	M	M	M	-	M	-	-	-	+
<u>Condiments</u>																				
416. Mineral salt on surface . . . . .	-	-	-	-	-	-	-	-	-	+	+	-	-	+	-	-	-	-	-	-
417. From stalactites . . . . .	-	-	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-
418. Mined or dug out . . . . .	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-
419. Alkali "salt" from surface . . . . .	+	S	-	+	-	-	+	S	S	S	-	-	-	-	-	-	S	-	-	-
420. Salt from ocean . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+
421. Lake or spring . . . . .	-	+	-	-	-	-	+	+	+	+	+	+	+	-	+	+	+	+	-	-
422. Ritual journey to gather . . . . .	-	+	-	-	-	-	-	+	+	-	-	-	-	-	+	+	-	-	+	+
423. Scratching-stick for head . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+
424. Informally taken . . . . .	+	-	+	+	+	+	+	-	S	+	+	+	+	+	-	-	+	+	-	-
425. Ashes for spicing herbs . . . . .	-	+	-	-	-	-	-	+	-	-	-	-	-	M	+	+	-	-	-	-
426. Yucca (Spanish bayonet) leaf ash in maize mush . . . . .	-	S	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-
427. Juniper ashes in maize-meal mush . . . . .	+	+	-	-	-	+	-	+	-	-	-	+	+	M	+	-	-	+	-	-
428. Other ashes . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-
429. Ashes in paper bread . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	S	+	-	-	-
430. White mineral in paper bread . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
431. Clay eaten . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	+	+
434. Rabbit manure in maize cake . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-
435. Rabbit manure eaten with tuna . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
<u>Generalities Concerning Food Preparation</u>																				
436. Kitchen outside house in summer . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	S	S	S	S	+	+
437. Brush enclosure or wind- break . . . . .	S	+	+	S	+	+	+	+	+	+	+	+	+	-	-	+	+	+	+	+
438. In open . . . . .	S	S	-	S	-	S	S	-	-	-	-	-	-	+	(+)	-	-	-	S	-
439. Meat roasted on coals . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
440. Meat broiled on sharp stick . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
441. Meat boiled . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
442. Meat in earth oven . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
443. Soup eaten . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
444. Stone pot rests . . . . .	-	+	-	+	-	-	-	-	-	-	-	+	-	+	+	+	+	+	+	+
445. Number of pot rests, 3 . . . . .	-	+	-	-	+	-	-	-	-	-	-	+	-	-	+	+	+	+	+	+
445a. Number of pot rests, 4 . . . . .	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-
446. Basket boiling . . . . .	-	-	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-
447. Pot boiling . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
448. Basket parching . . . . .	+	+	+	+	+	+	+	+	+	+	-	-	-	+	-	-	-	-	S	+
449. Pot parching . . . . .	+	+	-	+	-	-	-	+	+	+	-	+	+	+	+	+	+	+	+	+
450. Cooking in earth oven . . . . .	+	+	+	+	+	+	+	+	+	+	+	-	-	+	+	+	+	+	+	+
451. Mescal . . . . .	-	-	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	+	+
452. Maize . . . . .	-	+	+	+	+	+	+	+	+	-	-	-	-	+	+	+	+	+	-	-
453. Other plants . . . . .	-	-	-	-	-	-	-	+	-	+	+	-	-	+	+	+	-	+	+	+
454. Fish . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+
455. Several families . . . . .	S	+	S	+	S	S	S	+	+	+	+	-	-	-	-	S	S	S	+	+
456. Single family . . . . .	S	+	S	+	S	S	+	S	S	S	S	-	-	+	+	+	+	+	+	+
457. Oven cover of maize foliage . . . . .	+	+	-	+	+	+	+	+	-	+	-	-	-	+	+	+	+	S	-	-
458. Grass . . . . .	-	+	-	+	-	+	+	+	+	+	+	-	-	-	S	-	S	S	+	+
459. Fire on top of oven . . . . .	S	+	-	-	-	S	-	-	-	-	-	-	-	+	+	S	+	+	S	S

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
460. Meat sliced and dried . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
461. Drying frame, Plains type (Wissler, fig. 3) . . . . .	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
462. Meat salted when drying . . . . .	-	-	-	-	-	-	-	+	-	-	-	+	+	-	+	+	M	+	+	+
463. Small mammals dried . . . . .	-	+	+	+	+	+	-	+	+	-	-	-	-	-	+	+	+	+	+	+
464. Fish dried . . . . .	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-
465. Small mammals pounded . . . . .	-	-	+	-	-	+	+	+	-	+	-	-	-	+	+	+	+	+	+	+
466. Venison pulverized (pemmican) . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
467. Fat mixed with it . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-
468. Bones broken and boiled . . . . .	-	+	+	+	-	+	+	+	+	+	+	-	-	-	+	+	+	+	+	-
469. Vertebrae pulverized and eaten . . . . .	-	-	+	+	-	+	+	-	-	-	-	+	-	-	-	-	-	-	-	-
470. Marrow extraction . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
471. Blood cooked in paunch . . . . .	+	+	+	+	+	+	+	+	+	+	+	-	-	+	-	+	+	+	+	-
472. Sausages in gut . . . . .	+	+	+	+	+	+	+	+	+	+	-	-	-	+	-	+	+	-	-	-
<u>Food Storage</u>																				
473. Bird-nest storage baskets . . . . .																				+
474. Coiled storage baskets . . . . .	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
475. With cover of basketry . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
476. Huge twined basket for cave storage . . . . .	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
477. Huge wicker basket for house storage . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
478. Granary on platform . . . . .	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+
479. Ramada serves . . . . .	+	-	-	-	-	-	-	S	-	-	-	-	-	-	-	-	-	-	-	+
480. Notched-log ladder for access . . . . .	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
481. Pit storage . . . . .	+	+	+	+	+	+	+	+	+	-	+	-	-	+	+	+	-	-	S	S
482. Bottle-shaped pit . . . . .	-	+	-	-	-	-	+	+	-	-	-	-	-	+	-	+	-	-	-	-
483. Juniper-bark-lined pit . . . . .	+	-	-	-	-	+	+	+	+	-	-	-	-	+	-	S	-	-	-	-
484. Straw-lined pit . . . . .	-	-	-	-	-	+	+	+	+	-	+	-	-	+	-	S	-	-	-	-
485. Slab-lined pit . . . . .	-	-	-	-	+	+	+	+	+	-	+	-	-	-	+	+	-	-	-	-
486. Burden basket in pit . . . . .	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
487. Pitched basket in pit . . . . .	-	-	-	-	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-
488. Skin bag for food storage . . . . .	+	+	-	+	+	+	-	+	+	+	+	+	+	+	-	+	+	+	-	+
489. Parfleche for food storage . . . . .								+	+	+	+	+	+	-	-	-	+	-	-	-
490. Stored in pit . . . . .		S	-	+	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-
491. Placed on platform in cave . . . . .	-	-	-	-	-	-	-	+	+	+	+	-	-	+	-	-	-	-	-	-
492. Bag hung in house or cave . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	+
493. Wall niche for storage . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
494. "Potato" storage on cave floor . . . . .	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
495. Storage in pot . . . . .	+	+	+	+	+	+	+	-	+	+	-	-	-	+	+	+	+	+	+	+
496. Buried in pit . . . . .	-	-	+	+	+	+	-	-	+	-	-	-	-	-	+	+	-	-	-	+
497. Cached in rock shelter . . . . .	+	+	+	+	+	+	+	-	+	+	-	-	-	+	+	+	-	+	+	+
498. Covered with lid . . . . .	+	+	+	+	+	+	+	-	+	+	-	-	-	+	+	S	+	+	+	+
499. Skin cover . . . . .	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
500. Mud and grass plug . . . . .	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+	+	-	-	+
501. Tree platform . . . . .	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	S	-	-
<u>AGRICULTURE</u>																				
502. Distribution: all families . . . . .	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	-
503. All who could . . . . .	-	+	+	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-
504. Only some who could . . . . .	-	-	-	+	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	+
505. Exceptional families . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
506. None . . . . .	-	-	-	-	-	-	-	-	+	-	+	+	+	-	-	-	-	-	-	-
507. Without irrigation . . . . .	+	+	+	+	-	+	+	+	-	-	-	-	-	+	+	+	+	+	+	+
508. Irrigation (native only) . . . . .	+	+	+	+	+	-	+	-	-	+	-	-	-	S	-	+	+	+	+	-
509. Ditches . . . . .	-	+	+	+	+	-	-	-	-	+	-	-	-	-	-	+	+	+	+	-

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
510. Dams . . . . .	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-
511. By hand (pots) for small gardens . . . . .	S	S	-	-	-	-	-	-	-	-	-	-	-	S	-	+	-	+	-	-
512. Natural, flooding . . . . .	+	-	S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S	-	-
513. Wing fences to concentrate rain flow . . . . .	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	+	+	-	+	+
514. Ditches to divert excess rain . . . . .	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-
515. From springs . . . . .	-	-	+	+	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-
516. From streams . . . . .	-	+	-	+	+	-	+	-	+	-	-	-	-	-	-	S	+	+	-	-
517. Sites and soil: sandy . . . . .	+	-	S	-	S	-	-	-	+	-	-	-	-	+	+	+	-	-	+	+
518. Red earth (heavy soil) . . . . .	-	-	-	-	S	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-
519. Black earth (heavy soil) . . . . .	-	+	+	+	+	+	+	-	-	-	-	-	-	-	+	+	-	+	-	-
520. Stream bottom lands . . . . .	+	-	+	+	+	+	+	+	-	+	-	-	-	-	-	+	+	+	-	-
521. Arroyo mouths . . . . .	S	+	-	-	-	+	+	-	-	-	-	-	-	-	S	-	S	S	+	+
522. Sex labor: clearing by men . . . . .	+	+	+	+	+	-	-	+	-	+	-	-	-	+	+	+	+	+	+	+
523. Clearing by women . . . . .	+	-	-	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	+	+
524. Planting (with tool) by men . . . . .	+	+	+	+	+	+	-	+	-	+	-	-	-	+	+	+	+	+	+	+
525. Planting (with tool) by women . . . . .	+	-	-	+	-	+	+	+	-	-	-	-	-	-	-	-	+	-	+	+
526. Seeding by men . . . . .	+	-	-	+	-	?	-	+	-	+	-	-	-	+	+	+	+	+	+	+
527. Seeding by women . . . . .	+	+	+	+	+	?	+	+	-	-	-	-	-	-	-	-	+	S	+	+
528. Cultivating (weeding) by men . . . . .	+	+	+	+	+	-	-	+	-	+	-	-	-	+	+	+	+	+	+	+
529. Cultivating (weeding) by women . . . . .	+	-	-	+	+	+	+	+	-	-	-	-	-	-	-	-	-	S	+	+
530. Guarding by men . . . . .	+	+	+	+	?	?	+	?	-	-	-	-	-	-	+	+	+	+	+	+
531. Guarding by women . . . . .	+	+	-	+	?	?	+	?	-	-	-	-	-	+	-	-	+	-	-	-
532. Scarecrow (see fig. in Notes) . . . . .	+				+	?	-	+	-	+	-	-	-	-	+	+	+	+	+	+
533. Irrigating by men . . . . .	+	+	+	+	+	-	+	-	-	+	-	-	-	-	-	+	+	+	+	-
534. Irrigating by women . . . . .	+	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
535. Harvesting by men . . . . .	+	+	+	+	+	-	+	+	-	+	-	-	-	+	+	+	+	+	+	+
536. Harvesting by women . . . . .	+	-	+	+	+	+	+	+	-	+	-	-	-	-	-	-	+	+	+	+
537. Hired help, men . . . . .	-	+	+	+	+	-	-	-	-	+	-	-	-	-	-	-	-	-	(+)	(+)
538. Hired help, women . . . . .	+	+	+	+	+	+	+	-	-	+	-	-	-	-	-	-	-	-	(+)	(+)
539. Reciprocal help . . . . .	+		-	+				+							+	+	+	+	+	+
<u>Tools</u>																				
540. Straight stick, average length 3½ ft. . . . .	+	+	+	+	+	+	+	+	-	-	-	-	-	+	+	+	+	+	+	+
541. With foot rest . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	+	+	-	-
542. Used as planter, too . . . . .		+				+	+	+	-	-	-	-	-	+	+	+	+	+	+	+
543. Heavy, man's-length, 2-handed plunge . . . . .	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
544. Also used as planter . . . . .	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
545. Spatula weeder ("weaving-sword type") . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	+	+	?
546. Cut with side motion . . . . .		+												+					+	?
547. Large, heavy weeder (end only cuts) . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	?
548. Hoes (on handle at angle) . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	M
550. Wooden blade . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-
551. Digging-stick weeder . . . . .	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<u>Maize</u>																				
552. Only 1-3 colors . . . . .	-	-	-	-	+	-	+	-	-	+	-	-	-	+	-	-	-	-	-	-
553. 4-8 colors . . . . .	+	+	+	+	-	+	-	+	-	-	-	-	-	-	+	+	+	+	+	+

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
554. Sweet maize . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	+	-	
555. Popcorn . . . . .	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
556. Soft maize (gray) . . . . .	-	+	-	-	-	+	-	-	-	-	-	-	-	-	+	+	-	?	-	
557. Planting: in winter . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+
558. In summer . . . . .	+	+	+	+	+	+	+	+	-	+	-	-	-	+	+	+	+	+	+	+
559. Hilled when growing . . . . .	-	+	+	+	-	-	-	+	-	+	-	-	-	-	-	+	+	+	+	-
560. Planted in rows . . . . .	+	+	-	-	+	-	-	+	-	+	-	-	-	+	+	+	+	+	+	-
561. Planted in helix (clock-wise) . . . . .	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
562. Planted irregularly . . . . .	-	-	+	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+
563. Planted during waxing or full moon . . . . .	-	+	+	+	-	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-
564. Windbreak for growing plants . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S	+	-	-	-	-
565. Storage: dried in "braids," hung up . . . . .	+	+	+	+	+	+	+	+	-	-	-	-	-	-	+	+	S	+	S	
566. Dried spread on roof or platform . . . . .	+	-	+	+	-	-	-	+	-	+	-	-	-	-	+	+	-	+	+	
567. Parched slightly to dry . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S	S	S	-	+	
568. Stored in granary . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	
569. Stored in back rooms . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	
570. Stored in pits . . . . .	+	+	-	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	
571. Stored in rock shelter . . . . .	-	-	+	-	+	-	-	+	-	-	-	-	-	-	-	S	-	S	+	
572. Piled in tiers . . . . .	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	+	+	+	-	
573. Year's supply against famine . . . . .	S	+	-	+	-	S	-	-	-	-	-	-	-	-	+	+	S	+	+	
574. Shelled by beating with stick . . . . .	+	+	+	+	+	+	+	-	-	-	-	-	-	-	S	-	-	-	-	
575. Shelled by hand . . . . .	+	+	+	+	+	+	+	+	-	+	-	-	-	-	+	+	+	+	+	
576. "Awl" to loosen kernels . . . . .	+	+	-	+	+	+	+	+	-	-	-	-	-	-	-	-	+	-	-	
577. Shelled by men . . . . .	-	-	+	-	+	+	-	+	-	-	-	-	-	-	-	-	+	+	+	
578. Shelled by women . . . . .	+	+	+	+	+	+	+	+	-	+	-	-	-	-	+	+	+	+	+	
579. Shelled maize stored . . . . .	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	+	
580. Cooking: green maize roasted, no husks . . . . .	+	+	+	+	+	+	+	+	-	+	M	-	-	-	+	+	+	+	+	
581. Roasted whole in husks . . . . .	+	+	+	+	+	+	+	+	-	+	-	-	-	+	+	+	+	+	+	
582. Steamed in earth oven in husks to hasten ripening and drying . . . . .	+	+	+	+	+	+	+	+	-	-	-	-	-	-	+	+	+	-	-	
583. Boiled on cob . . . . .	+	+	+	+	+	+	+	+	-	+	-	-	-	-	+	+	+	+	+	
584. Parched before grinding . . . . .	+	+	+	+	+	+	+	+	-	+	-	-	-	-	+	+	+	+	+	
585. Eaten without further cooking (pinole) . . . . .	S	-	-	-	-	-	+	S	-	-	-	-	-	-	+	+	S	S	S	
586. Lime or ash boiled . . . . .	-	-	-	-	-	-	-	+	M	+	M	-	-	-	+	+	+	+	+	+
587. Eaten at once (hominy) . . . . .	-	-	-	-	-	-	-	+	M	+	M	-	-	-	+	+	+	+	+	+
588. Dried and pulverized . . . . .	-	-	-	-	-	-	-	+	M	+	M	-	-	-	-	+	+	+	-	+
589. No treatment before grinding . . . . .	-	S	-	S	-	-	S	S	-	S	-	-	-	-	+	S	-	S	+	
591. Ground on metate . . . . .	+	+	+	+	+	+	+	+	+	+	-	M	M	-	+	+	+	+	+	
592. Maize kernels boiled with beans . . . . .	+	+	-	-	+	+	+	+	-	+	-	-	-	-	+	+	+	+	+	+
593. Steamed with beans in earth oven . . . . .	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	
594. Maize-meal mush . . . . .	+	+	+	+	+	+	+	+	-	+	-	-	-	-	+	+	+	+	+	
595. Green-maize mush . . . . .	+	+	+	+	+	+	+	+	-	+	-	-	-	-	-	-	+	+	+	
596. Mush of saliva-sweetened meal frozen overnight . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	
597. Chewed meal mixed with batter for breadstuff . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	

	WN	EN	NT	ST	SC	Gi	WM	WS	Hu	Me	Li	Li	Ol	SU	Wa	Zu	SA	SI	KP	HP
598. Stiff mush boiled in husks (tamale) . . . . .	+	+	+	+	+	+	+	+	-	+	-	-	-	-	-	-	+	+	+	
599. Hominy (ground) boiled in husks (tamale) . . . . .									-		-	-	-				+	+	+	+
600. Dumplings, boiled . . . . .	+	+	+	+	+	+	+	+	-	-	-	-	-	-			+	-	+	-
601. Cake in layer in earth oven . . . . .	+	+	-	-	+	+	-	+	-	-	-	-	-	-			-	-	-	-
602. Pudding in pot in earth oven . . . . .									-	-	-	-	-				+	+		
603. Dough-filled husks in earth oven . . . . .	+	+	-	-	+	-	-	+	-	-	-	-	-	-			+	-	-	-
604. Dough-filled husks in domed (Spanish) oven . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-				+		
605. Green-maize mush baked in husks in ashes . . . . .	+	+	+	+	+	-	+	+	-	+	-	-	-	-			-	-	+	-
606. Green-maize mush in husks in earth oven . . . . .	+	+	+	-	-	-	-	-	-	-	-	-	-	-			-	-	-	-
607. Green-maize mush in layer in earth oven . . . . .			+	+	+	+	+	+	-	-	-	-	-	-			-	-	-	-
608. Maize bread on hot stones, in coals, or on pottery pan . . . . .	+	+	-	-	+	+	-	+	-	+	-	-	-	-			+	S	+	+
609. Ashes added to batter . . . . .	+	+	-	-	-	+	+	-	-	-	-	-	-	-			-	+	+	-
610. Maize griddle cakes between two flat stones . . . . .	-	-	-	-	-	-	-	-	-	+	-	-	-	-			-	+	-	-
611. Paper bread on thin stone slabs . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	-			+	+	+	+
612. Number of colors . . . . .	-	4	-	-	-	-	-	-	-	-	-	-	-	-			7	4	3	4
<u>Beans</u>																				
613. Frijole . . . . .	+	M	+	+	+	+	+	+	-	+	-	-	-	-			+	+	+	M
614. Number of varieties . . . . .	7		1	4	1	2	3	1	-	2	-	-	-	-			6	6	3	2
615. Vines on ground . . . . .	+		+	+	+	+	+	-	-	+	-	-	-	-			+	+	+	+
616. Threshed on ground . . . . .	+		+	+	+	+	+	+	-	+	-	-	-	-			+	+	+	+
617. Stored in bag . . . . .	+							+	-	+	-	-	-	-			+	-	+	+
618. Stored in pottery vessel . . . . .					+	+		-	-	-	-	-	-	-			+	+	+	+
619. Stored in basket in pit . . . . .					+	+	?	-	-	-	-	-	-	-			-	-	-	-
620. Stored in basket in rock shelter . . . . .			+		-	+	?	-	-	-	-	-	-	-			-	-	-	S
621. Green-bean pods boiled . . . . .								+	-	+	-	-	-	-			+	+	+	+
622. Beans (seeds) boiled whole . . . . .	+		+	+	+	+	+	+	-	+	-	-	-	-			+	+	+	+
623. Ground before boiling . . . . .						S	S	S	-		-	-	-	-			+	+	+	-
624. Parched and pulverized with corn for mush . . . . .						+	+	+	-	-	-	-	-	-			-	-	-	-
625. Tepary . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-			(+)	?	+	?
626. Number of varieties . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-			(2)	-	1	-
627. Vines on ground . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-			+	-	+	-
628. Threshed on ground . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-			+	-	+	-
629. Stored in pot . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-			+	-	-	+
630. Boiled . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-			+	-	+	-
631. Cowpea (black-eyed bean) . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-	+
<u>Pumpkins and Squashes</u>																				
632. Pumpkins and squashes . . . . .	+	+	+	+	+	+	+	+	-	+	-	-	-	-			+	+	+	+
633. Number of varieties . . . . .	8	1	1	1	1	1	1	1	-	3	-	-	-	-			3	2	1	1
634. Green . . . . .	+	+	+	+	+	+	+	-	-	+	-	-	-	-			-	+	+	+
635. Yellow (orange) . . . . .	+	-	-	+	-	+	+	+	-	+	-	-	-	-			M	-	+	+
636. Striped . . . . .	+	+	+	+	+	-	+	-	-	+	-	-	-	-			+	+	+	+



	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
691. Eaglets tied to log in nest . . . . .		+	+	+	+	-	-		-	-	-	-	-	-	-	-	-	-	-	-
692. Purification of eaglet catcher . . . . .																				+
693. Wooden cage or "house" for eagle . . . . .	-	-	-	-	-	-	-	-	-	+	+	-	-	+	+	+	+	+	+	+
694. Eagle kept on string . . . . .		-						+	-	+	-	-	-	+	+	-	-	-	-	-
695. Plucked eagle released . . . . .	+	+	+	+	+	-	-	-	-	+	+	-	-	+	-	-	-	-	-	+
696. Captive eagle killed and plucked when adult . . . . .								+	-	-	-	-	-	-	+	-	-	-	-	-
697. Kept permanently . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-
698. Aeries owned . . . . .	+	-	+	+	+	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-
699. Mockingbirds kept . . . . .	-	-	+	-	+	-	-	+	-	-	-	-	-	-	-	+	-	+	+	+
700. Square bird cage . . . . .		-						+	-	+	S	-	-	-	-	+	-	+	+	+
701. Round bird cage (domed) . . . . .	+				+	-	+	-	+	-	S	-	-	-	-	-	-	-	-	+
HOUSES																				
<u>Dwelling (Thatch and Earth Covered)</u>																				
702. Earth covered . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
703. Not covered with earth . . . . .	+	-	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	+
704. Earth banked up sides a foot or so . . . . .	-	-	+	+	+	-	+	-	+	-	-	-	-	-	-	-	-	-	-	+
705. Round in floor plan (see fig. in Notes) . . . . .	+	+	+	+	+	+	+	+	+	+	+	-	-	+	+	-	-	-	-	+
706. Elliptical . . . . .	+	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
707. No center post . . . . .	+	+	+	+	+	+	+	+	+	+	+	-	-	+	+	-	-	-	-	+
708. 4 corner posts, 8-12 in. diam. . . . .	+	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
709. Posts leaned together . . . . .	+	+	-	-	-	+	+	+	-	-	+	-	-	-	+	-	-	-	-	-
710. 4 foundation posts . . . . .	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-
711. 3 foundation posts . . . . .	+	+	-	-	-	-	-	+	-	-	+	-	-	-	+	-	-	-	-	-
712. Forked . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
713. From opposite walls . . . . .	+	+	-	-	-	+	+	+	-	-	+	-	-	-	+	-	-	-	-	-
714. Walls vertical . . . . .	+	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
715. Sloping, leaned . . . . .	+	+	-	-	-	+	+	-	-	-	+	-	-	-	+	-	-	-	-	+
716. Domed, one with roof . . . . .	+	+	+	+	+	S	S	S	+	+	+	-	-	+	-	-	-	-	-	+
717. Walls of many close sticks . . . . .	+	+	+	+	+	+	+	+	+	+	+	-	-	+	+	-	-	-	-	+
718. Of laid logs . . . . .	+	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
719. Poles with thatch . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+
720. Thatched huts . . . . .	+	+	+	+	+	+	+	+	+	+	+	-	-	+	+	-	-	-	-	+
721. Juniper, etc., bark . . . . .	-	+	S	-	-	-	-	S	-	-	-	-	-	+	-	-	-	-	-	-
722. Binding poles, horizontal . . . . .	-	-	-	+	+	+	+	+	+	-	+	-	-	-	-	-	-	-	-	-
723. Lashings . . . . .	-	-	+	+	+	+	+	+	+	-	+	-	-	-	-	-	-	-	-	+
724. Hides over thatch . . . . .	-	-	-	-	-	-	-	M	M	+	+	-	-	-	-	-	-	-	-	-
725. Pegs for hide covering . . . . .	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
726. Roof one with walls . . . . .	+	+	+	+	+	+	+	+	+	+	+	-	-	+	+	-	-	-	-	-
727. Poles bent to meet on top . . . . .	-	-	+	+	+	S	S	+	+	+	+	-	-	+	-	-	-	-	-	-
728. Roof separate from walls . . . . .	+	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
729. "Brush on roof" . . . . .	+	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
730. Thatch . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
731. Dirt over thatch . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
733. Floor dug out, 5-12 in. . . . .	+		-	+	+	+	-	-	+	-	-	-	-	-	+	-	-	-	-	-
734. No special floor material added . . . . .	+	+	+	+	+	+	+	+	+	+	+	-	-	+	+	-	-	-	-	+
735. Doorway rectangular, with lintel . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
736. Top domed . . . . .	-	-	+	+	+	+	-	-	-	-	S	-	-	-	-	-	-	-	-	-
737. Faces sunrise . . . . .	+	+	+	+	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-
738. Faces down-wind . . . . .	-	-	+	+	+	+	-	+	+	-	-	-	-	+	-	-	-	-	-	-





	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
824. Bark-and-branch covering . . . . .	-	+	+	-	-	+	-	+	+	+	+	-	-	+	-	+	-	-	-	-
825. Grass covering . . . . .	-	-	+	+	-	+	-	+	+	+	+	-	-	-	-	-	-	-	-	-
826. Earth covering . . . . .	+	+	+	+	-	+	-	+	-	+	-	-	-	+	-	+	-	-	-	-
827. Skin covering . . . . .	-	-	-	-	+	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-
828. Permanent . . . . .	+	+	+	+	-	+	-	+	-	+	-	-	-	+	-	+	-	-	-	-
829. Hot stones and steam . . . . .	+	+	+	+	+	+	+	+	+	+	+	-	-	+	-	+	-	-	-	-
830. Entrance faces sunrise . . . . .	+	-	+	+	+	+	-	+	+	+	+	-	-	+	-	-	-	-	-	-
831. Used by men, daytime only . . . . .	+	+	+	+	+	+	+	+	+	+	+	-	-	+	-	+	-	-	-	-
832. Used by women also . . . . .	S	+	-	-	-	-	-	-	-	+	-	-	-	+	-	+	-	-	-	-
833. Sweating for curing . . . . .	+	+	+	+	+	-	-	+	+	+	+	-	-	+	-	+	-	-	-	-
834. Sweating before dancing . . . . .	+	+	+	-	+	+	+	+	+	-	-	-	-	+	-	-	-	-	-	-
835. Sweating before war . . . . .	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-
836. Sing while sweating . . . . .		+		+				+	+	+	+	-	-	S	-	-	-	-	-	-
837. Sweating by doctor before treating . . . . .	+	-	+	-	-	+	-	-	S	-	-	-	-	+	-	-	-	-	-	-
838. Taboo to new father . . . . .	-	+	+	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
839. Taboo to one associated with menstruant . . . . .	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
840. Taboo after intercourse . . . . .	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
841. Rolling in sand after sweat . . . . .	+	+	-	-	-	-	+	+	+	-	-	-	-	S	-	-	-	-	-	-
842. Beat selves with grass . . . . .		-								+	?	-	-	-	-	-	-	-	-	-
843. Bathing after sweat . . . . .	S	+	+	+	+	+	+	+	+	-	+	-	-	+	-	-	-	-	-	-
NAVIGATION; SWIMMING																				
844. Tule raft, towed by swimmer . . . . .	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
845. Log raft . . . . .	-	-	-	+	+	+	+	+	+	+	+	-	+	-	-	-	-	+	-	-
846. Single log or pole to aid swimmer . . . . .	-	+	-	+	-	-	-	S	S	S	+	-	-	S	-	-	-	-	-	-
847. 2 logs to carry provisions . . . . .	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-
848. Several logs lashed together . . . . .	-	-	-	-	+	+	+	+	+	+	S	-	S	-	-	-	-	-	-	-
849. Hide bullboat, towed by swimmer . . . . .	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
850. Ferriage in basket (infant, etc.) . . . . .	-	-	-	-	S	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-
851. Log across stream as bridge . . . . .	-	-	-	-	-	-	S	S	S	+	+	+	-	+	-	+	+	+	+	-
852. Swimming: overhand . . . . .	+	+	+	+	-	-	+	-	+	+	-	-	+	+	+	-	+	+	+	-
853. Breast stroke . . . . .	-	-	-	-	-	+	-	-	-	+	+	-	-	-	-	-	-	-	-	-
854. Side stroke . . . . .	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
855. Crawl . . . . .	-	-	-	-	+	-	-	+	+	+	+	-	-	-	-	-	-	-	S	-
856. On back, frog stroke with feet . . . . .	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
GRINDING																				
857. Metate: rectangular type (back-forth) . . . . .	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+
858. Vesicular lava . . . . .	-	-	+	+	+	+	+	+	+	+	-	+	+	-	+	+	+	+	+	+
859. Sandstone . . . . .		-	-	-	-	-	-		+	-	-	-	+	-	-	-	-	-	-	-
860. Bedrock metate . . . . .	-	-	-	-	S	+	S	S	S	+	(S)	-	-	S	-	-	-	-	-	+
861. For maize grinding . . . . .	+	+	+	+	+	+	+	+	-	+	-	M	M	-	+	+	+	+	+	+
862. For beans . . . . .	-	M	-	-	-	+	+	+	-	-	-	-	-	-	+	+	+	+	+	+
863. Seeds . . . . .	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	?	+	+
864. Other (see Notes). . . . .		-	-	+	+	+	M	+	+	+	-	+	+	+	+	+	-	-	+	+
865. Movable . . . . .	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	-	-	-	-	+
866. Set in house permanently. . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	-
867. Set in box or bin . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	-
868. Several graded for coarse and fine . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	-

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
869. Slopes away at angle . . .	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+
870. Grinders sing together . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
871. Others sing for them . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	-	S	+	-	+	-	-
872. Muller meant for 2 hands . . . . .	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+
873. Rectangular (rounded) in cross section . . . . .	-	-	+	+	+	+	-	+	+	+	-	-	-	-	-	-	+	+	+	+
874. Triangular in cross section . . . . .															+					-
875. Vesicular lava muller . . . . .	-	-	+	+	+	+	+	+	+	+	-	+	+	-	+	-	S	S	+	+
876. Other stone . . . . .	+	+	S	+	-	+	+	S	+	+	-	-	-	+	+	?	?	?	?	?
877. Muller used with 1 hand (2 optional) . . . . .	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
878. Oval or round, only base flat . . . . .	+	-	+	-	-	+	-	-	+	+	-	+	+	-	-	-	-	-	-	+
879. Bedrock mortar . . . . .	-	-	+	+	+	+	+	+	+	+	+	-	-	+	-	-	-	-	+	+
880. Portable stone mortar for food . . . . .	-	-	-	-	-	+	-	+	-	+	+	-	-	-	+	-	+	+	-	+
881. Found, not made . . . . .	-	-	-	-	-	+	-	+	-	+	+	-	-	-	-	-	-	-	-	-
882. Made by users . . . . .	-	-	-	-	-	-	-	+	-	+	-	-	-	-	+	-	+	+	-	+
883. Small portable stone mortar and pestle . . . . .	-	-	+	-	-	+	-	+	-	+	+	-	-	-	+	+	+	+	-	-
884. Found, not made . . . . .	-	-	-	-	-	+	-	+	-	+	+	-	-	-	-	-	-	-	-	-
885. For tobacco and leaves mixed with tobacco . . . . .	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
886. For paint . . . . .	-	-	+	-	-	-	-	S	-	+	-	-	-	-	-	-	+	+	-	-
887. Outside shaped . . . . .	-	-	-	-	-	-	-	+	-	+	-	-	-	-	+	-	S	+	-	-
888. Wooden mortar . . . . .	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	+
889. In end of planted-log section . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+
890. Stone pestle, 12-15 in. long . . . . .	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	+
891. Wooden pestle . . . . .	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-
892. Stone pestle . . . . .	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+
893. Found, not made . . . . .	-	-	-	-	-	S	-	+	+	+	+	+	+	-	-	-	-	?	S	+
894. Natural stone . . . . .	-	-	+	+	S	S	+	+	+	+	+	-	-	-	-	-	+	?	S	+
895. Shaped by users . . . . .	-	-	+	-	+	+	-	S	-	-	-	-	-	-	+	-	S	?	+	-
896. Pit mortar, rawhide lined . . . . .	-	-	-	-	-	-	-	+	+	+	+	+	+	-	-	-	-	-	+	-
897. Pit mortar with stone at bottom . . . . .	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	+	-
899. Used for mesquite . . . . .	-	-	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-
900. Used for alligator juniper berries . . . . .	-	-	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-
BRUSHES																				
901. Grass bundle tied in middle . . . . .	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+
902. For meal . . . . .	+	+	+	-	-	+	+	+	+	-	-	-	-	+	+	+	+	+	-	-
903. For hair . . . . .	+	+	+	+	+	+	+	+	-	+	-	+	+	+	+	+	+	+	+	+
904. Porcupine tail for hairbrush . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
905. Yucca-fiber brush . . . . .	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
906. Agave-fiber brush . . . . .	-	-	+	+	+	+	-	+	+	+	+	-	-	-	-	-	-	-	-	-
907. Swab for imbibing liquid . . . . .	+	+	-	-	-	+	+	-	-	+	-	-	-	-	-	-	-	-	+	+
908. Animal-hair swab . . . . .	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+
909. Juniper-bark swab . . . . .	-	+	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-
STIRRERS AND STONE LIFTERS																				
910. Paddle . . . . .	-	-	+	-	-	-	-	-	-	+	-	-	-	+	-	-	-	+	+	+
911. 2 sticks for handling hot stones . . . . .	+	-	-	-	-	-	-	+	S	-	-	-	-	-	S	-	-	S	-	-
912. Forked stick for handling hot stones . . . . .	+				+	+	+	+	+	-	-	-	-	+	S	+	+	-	(+)	-

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
913. Tongs to handle hot stones . . . . .	-	-	+	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	+	
914. Withe looped under hot stones . . .		+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	
915. 1-stick food stirrer . . . . .	-	S	-	-	S	-	-	+	+	+	+	+	+	S	+	-	+	+	+	
916. 2- to 7-stick food stirrer . . . . .	+	+	+	+	+	+	+	-	-	-	-	-	+	-	S	+	-	+	-	
917. 10- to 12-stick food stirrer . . . .																+	+	-	-	
918. Tongs to lift out boiling meat . . .	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
919. Boiling meat speared with sharp stick . . . . .		+			+	+	+	+	+	+	+	+	+	+	+	+	-	-	+	+
SPECIAL RECEPTACLES																				
920. Shell (natural) as container . . . . .	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	+	-
921. Turtle- or tortoise-shell cup . . . .	+	+	-	-	-	-	-	+	+	+	+	+	+	+	-	-	-	-	-	-
922. For medicine container . . . . .	+	+	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-
923. Ladle of mt.-sheep horn . . . . .	-	+	-	-	-	-	-	+	-	-	-	-	-	+	+	-	-	+	-	
924. Wooden bottom . . . . .	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
925. Buffalo drinking horn . . . . .										+	+	-	-		-	-	-	+	-	
926. Buffalo-horn ladle . . . . .										+	+	-	-	+	-	-	-	+	-	
927. Horn heated (or boiled) in working . . . . .	-	-	-	-	-	-	-	+	-	-	+	-	-	+	-	-	-	+	-	
928. Wooden spoon or ladle . . . . .	+	-	-	-	-	-	-	-	-	+	+	-	-	-	-	+	+	+	+	
929. Stone cup . . . . .	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	(+)	
930. Cup made from burnt-out pine wart . . . . .	+	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	
931. Husk of dead mescal butt as container . . . . .	-	-	+	+	+	-	-	S	-	-	+	-	-	-	-	-	-	-	-	
932. Wooden platter for meat . . . . .	+	-	-	-	-	-	-	+	-	+	+	-	-	+	-	+	-	-	-	
933. Wooden bowls . . . . .	+	+	-	+	-	-	-	+	+	+	+	+	+	+	+	+	-	-	+	+
934. Oak bole . . . . .	+	-	-	+	-	-	-	+	+	+	+	+	+	+	+	+	-	-	-	-
KNIVES; AWLS, NEEDLES																				
935. Impromptu flake (not retouched) . .	+	+	+	+	+	+	+	+	+	+	+	?	?	+	?	-	?	+	+	
936. For wood hacking or sawing . . . . .	+	-	+	+	+	+	+	-	?	+	+			S		-		-	-	
937. For skinning . . . . .		+	+	+	+	+	+	+	+	+	+			+		+		+	+	
938. Chipped knife (retouched) . . . . .	+	-	+	+	+	+	+	+	+	+	+	?	?	+	+	+	+	+	+	
939. Double edged (see fig. in Notes) . . . . .	?	-	-	+	-	-	-	+	+	+	+			-	+	-	+	-	+	
940. Single edged . . . . .		-	+		+	+	+	-	-	-	-			+	?	+	+	+	+	
941. For butchering . . . . .	+	-	+	+	+	+	+	+	+	+	+			+	+	+	?	+	+	
942. For carving wood . . . . .	?	-	+	+	+	-	-	-	+	+	-			-	-	-		-	+	
943. Buckskin wrapped on stone . . . . .			-	-	-	-	+	S	+	+	+			-	-	S		S	-	
944. Handle bound with wet rawhide . . . . .									+	+	+			-	-	-	+	+	-	
945. Blade set in wooden handle (groove hafting) . . . . .	?	-	-	+	-	-	-	+	+	+	-			-	+	-		-	-	
947. Pitched in handle . . . . .	?	-	-	-	-	-	-	-	+	+	-			-	-	-		-	-	
948. Shoulder hafted . . . . .			-	+	-	-	-	-	-	-	-			-	-	-		-	-	
949. Cane knife . . . . .	?	-	-	-	-	-	-	-	-	-	-			-	+	-	-	-	-	
950. Wooden knife (see no. 383) . . . . .	-	-	+	+	-	-	-	-	-	-	-			+	-	-	-	+	-	
950. Bone knife . . . . .	-	-	-	-	-	-	-	-	-	+	-	+		-	-	-	-	-	-	
952. Bone "chopping" knife (shoulder blade) . . . . .								+	+	-	-	-		-	-	-	-	-	-	
953. Mescal knife, all stone, chopping- knife shape (see figs. in Notes) . . . . .	-	-	-	+	-	-	-	?	?	?	-	-		-	-	-	-	-	-	?
954. Elliptical-stone mescal knife, retouched . . . . .	-	-	+	-	-	-	-	?	?	?	-	-		-	-	-	-	-	+	?

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
955. Plain flake, unretouched . . . .	-		+	+	+	+	+	?	?	?	+	-	-	-	-	-	-	-	-	?
957. Hardwood awl . . . . .	+	-	-	-	-	-	-	-	?	-	-	-	-	-	-	+	+	-	+	
958. Bone awl . . . . .	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	-	
959. Deer leg bone . . . . .	+	+	+	+	+	?	+	+	+	+	-	+	+	-	+	+	+	+	-	
960. Penis bone of badger . . . .	-	-	-	-	-	?	-	-	-	-	-	-	-	-	+	-	-	-	-	
961. Antler awl . . . . .	+	-	+	+	-	+	+	-	-	+	-	+	-	-	-	+	-	+	-	
962. Handled awl . . . . .	-	+	+	-	+	+	+	-	+	-	-	S	-	-	+	-	+	S	-	
963. Awl scabbard of hide . . . . .		+											+	+	-	+	+	+	-	
964. Awl for coiled basketry . . . .	+	+	+	+	+	+	+	+	+	+	-	+	+	+	-	+	+	+	+	
965. Awl for skin sewing . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	
966. Awl for boring wood . . . . .	-	-	-	+	-	-	-	S	-	-	-	+	-	S	+	S	-	-	-	
967. Saguaro-rib thatch needle . . . .																				+
968. Needle with eye (bone) . . . . .	-	-	-	-	-	-	-	-	-	-	M	-	-	-	+	+	+	-	-	
969. Needle with eye (hardwood) . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	+	
970. Agave or yucca needle with at- tached fibers for thread . . . .	-	-	-	-	+	-	-	-	?	-	-	-	-	-	+	-	+	-	-	
DRILLING AND SMOOTHING																				
971. With tiny flint held in fingers.	+	+	+	+	+	+	+	+	+	+	+	-	+	+	-	-	-	-	+	
972. Composite drill, stone pointed . .	-	+	-	+	+	-	-	+	-	S	-	+	-	+	+	+	+	+	-	
973. "Vise" for holding object drilled was hole in ground, rock, block of wood . . . . .	+	+	-	-	-	-	-	-	-	-	-	+	-	+	+	+	+	+	-	
975. On deer neck hide . . . . .	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	S	-	-	-	
976. Pump drill . . . . .	M	M	-	-	M	-	-	-	-	-	-	-	-	-	+	+	+	+	-	
977. Smoothing slab of sandstone . . . .	+	-	-	+	+	-	-	+	+	+	+	+	+	+	+	+	+	+	-	
978. Beads rolled on it . . . . .	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	
979. Beads revolved on grass stem or string . . . . .	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	
980. Beads flat-rubbed on it . . . . .	+	-	-	+	+	S	-	+	-	+	-	-	-	-	+	+	+	+	-	
WOODWORKING; HAMMERS, MAULS, AXES																				
981. Timber cutting by fire . . . . .	-	+	-	-	-	+	+	+	-	S	-	-	-	-	-	-	-	-	+	
982. Girdled . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	
983. Hollowing with fire . . . . .		+							-	+	-	+	+	+	+	-	-	+	-	
984. Fire to render wood flexible . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	
985. Held over fire . . . . .		+		+					+	+	+	+	-	-	+	+	+	-	+	
986. Moist hot wrapping to make wood flexible . . . . .	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	
987. In hot ashes . . . . .		+			+	-	+	+	-	-	-	-	+	-	-	-	-	+	-	
988. Fire hardening of wooden points . . . . .	+	-	+	-	-	+	+	-	+	-	+	+	-	+	-	-	-	+	-	
989. Filing by rubbing on stone . . . .	+	+	+	-	+	?	?	S	+	+	+	+	+	+	+	+	+	+	-	
990. Natural cobble for maul . . . . .	+	+	+	+	+	+	+	+	+	+	+	S	+	+	+	+	+	+	+	
991. Wooden maul, shaped . . . . .	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	
992. Chipped and ground hand ax . . . .		-												+	-	-	?	-	+	
993. Grooved-stone ax . . . . .	+	+	+	+	+	-	-	+	+	+	+	+	+	+	+	+	?	+	+	
994. Handle a stout withe . . . . .	+	+	-	-	+	-	-	-	-	+	+	+	+	-	+	+		+	S	
995. Handle a cleft stick . . . . .																			+	
996. Prehistoric ones used . . . . .	-	-	+	+	+	-	-	+	+	+	+	+	+	+	S	+		+	S	
997. As tool . . . . .	+	+	+	+	+	-	-	-	-	+	+	+	+	+	+	+		+	+	
998. Stone-flake improvised ax . . . . .		?	+		+	?	+	-	-	+	+	+	?	-	-	+	?	+	S	
999. Grooved-stone hammer . . . . .	+	-	-	-	-	+	-	+	+	+	+	+	-	+	-	+	?	-	+	
1000. Found, not made . . . . .		-	-	-	-	+	-	+	+	+	+	-	-	+	-	S		-	S	
1001. For dried vegetable foods . . . . .		-	-	-	-	-	-				+	S	-	-	-	+		-	S	



	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
1038. Leaned pole to scrape off hair .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1039. Post end to work skin soft . . . . .	+	-	-	-	+	+	+	-	-	-	-	+	+	+	-	-	-	-	-	+
1040. Worked soft over foot .		+						+	+	+	+	+	+	+	+	+	+	+	+	+
1041. Softened with brains and spinal marrow . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1042. Twisting and untwisting to express water and soften . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1043. Rubbed with stone to soften . .	+	-	-	+	S	+	+	-	+	S	+	-	+	+	-	+	-	+	-	-
1044. Scraped with toothed-bone tool . . . . .											+	-	-	-	-	-	-	-	-	-
1045. Coloring of leather . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	S	M	+	+	+	+	+	+
1046. Smoked yellow . . . . .										+	+	-	-		-	-	-	-	-	-
1047. Alder-bark dye . . . . .	+	+	+	+	?	+	-	-	-	-	-	-	-		+	-	+	+	-	-
1048. White clay rubbed on . .											+				-	+	+	+	-	-
1049. Other colors (see nos. 1279 ff.) . . . . .			+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+	+
1050. Rawhide used (nos. 288, 1195, 1475, 1554-1559, 1750, 1766) .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1051. Antelope-rawhide rope (nos. 1750, 1766) . .		+			+	-	+	+	+	-	-	+	-	-	+	+	-	+	-	-
1052. Rope of other rawhide (nos. 1750, 1766) . .		+						+			+	+	+	-	+	+	+	+	+	M
1053. Lashings . . . . .	-	-	-	-	+	?		+	+	+	+	+	+	-	+	+	+	+	+	+
WEAPONS																				
<u>Bows</u>																				
1054. Each man made own . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	-	-	+	+
1055. Self bow . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1056. Toy only (for boys) . .														+	-	-	S	S	-	-
1057. Of mulberry . . . . .		+	+	+	+	+	+	+	+	+	+	-	-	-	-	?	-	?	-	-
1058. Of oak . . . . .	+	+	-	-	-	-	-	-	-	+	+	+	+	+	+	-	+	+	+	-
1059. Of willow . . . . .			-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
1060. Of walnut . . . . .						+		-	+	+	+	+	+	-	-	?	-	?	-	-
1061. Of black locust . . . . .			-	+	+	-	-	-	+	+	+	-	-	-	-	?	-	?	-	-
1062. Of other wood . . . . .		+	-	+	+	+	-	-	+	+	+	+	-	-	-	?	+	+	+	+
1063. Bow nearly straight . .	-	+	-	+	+	+	+	S	+	+	+	+	+	+	-	+	+	+	+	+
1064. Double-curved . . . . .			-	+	+	-	-	S	-	S	S	-	-	-	-	+	-	-	-	-
1065. Painted . . . . .	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+	+	+
1066. Blood of kill smeared on . .	+	-	-	-	-	-	-	-	-	-	-	S	-	-	-	+	+	+	-	-
1067. Sinew-wound bow (self bow) . . . . .	-	-	-	-	-	-	-	+	+	-	+	-	-	-	+	(+)	-	-	-	-
1068. Tips sinew-wrapped (self bow) . . . . .	+	+					+	+	-	-	+	+	+	+	+	+	-	+	-	-
1069. Tips notched (self bow).		+							+	+	+	+	+	+	+	-	+	+	+	+
1070. "Trussed" bow with sinew cord down back . . . . .							+	+	+	-	-	-	-	-	-	-	-	-	-	-
1071. Sinew-backed bow . . . . .	+	+	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	-
1072. Made locally . . . . .	+	+	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	-
1073. Double-curved . . . . .			-	-	-	-	-					+	+	-	-	S	S	+	-	-
1074. Ends recurved . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
1075. Of oak . . . . .	+	+	-	-	-	-	-	-	-	+	-	+	-	+	-	-	+	+	+	-
1076. Of mulberry . . . . .		+	-	-	-	-	-	+	-	+	+	-	-	-	-	?	-	?	-	-
1077. Of juniper . . . . .	-	+	-	-	-	-	-	-	-	+	-	+	+	-	+	-	-	+	-	-
1078. Of black locust . . . . .			-	-	-	-	-				+	-	-	-	-	?	-	?	-	-
1079. Of other wood . . . . .	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	?	+	+	-	-
1080. Sinews: of deer . . . . .	+	+	-	-	-	-	-	+	+	+	+	S	+	+	-	+	(-)	+	-	-
1081. Other animals . . . . .	+	-	-	-	-	-	-	+	+	+	+	S	+	+	+	-	+	+	+	-
1082. Back sinews . . . . .	+	-	-	-	-	-	-	+	+	+	+	+	+	-	+	+	+	+	-	-

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
1083. Leg sinews (tendons) . . . . .	-	+	-	-	-	-	-	-	-	S	+	-	-	+	-	-	-	-	-	-
1084. Soaked . . . . .	+	+	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	-
1085. Glued . . . . .	+	+	-	-	-	-	-	+	S	+	+	+	+	+	+	+	+	+	+	-
1086. Glue of hide . . . . .	+	+	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	+	-
1087. Glue of horn . . . . .	-	-	-	-	-	-	-	-	-	+	+	-	-	+	-	-	-	-	-	-
1088. Pitch as adhesive . . . . .	-	-	-	-	-	-	-	+	+	+	-	+	+	-	-	-	-	-	-	-
1089. Bow string: of sinew . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+
1090. Deer back sinews . . . . .			+	+	+	+	+	+	+	+	+	S	+	-	+	+	-	+	+	+
1091. Deer leg sinews . . . . .			+	+		+								+	-	-	-	-	+	+
1092. Rawhide . . . . .															S		+			-
1093. Of vegetable fiber . . . . .	-	-	-	-	-	-	-	+	+	-	-	-	-	+	-	+	-	-	-	+
1094. 2-ply . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	+	+
1095. 3-ply . . . . .	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
1096. 4-ply . . . . .	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	+	-
1097. 1-"ply" . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-
1098. Bow held horizontally . . . . .	-	-	+	+	-	-	+	-	-	+	-	-	-	-	-	+	-	-	-	-
1099. Vertically . . . . .	-	-	-	+	+	+	+	+	+	-	-	+	+	-	+	-	+	-	-	+
1100. Obliquely . . . . .	+	+	+	+	-	+	-	-	-	S	+	-	-	+	-	+	-	+	-	-
<u>Arrows</u>																				
1101. 1-piece (without head or foreshaft) . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1102. Arrowweed . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
1103. Willow . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1104. Other materials . . . . .	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1105. Multiple-pointed . . . . .	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
1106. With cross sticks for birds . . . . .			+	+	+	+	+	+	+	+	+	+		+	+		-	+	-	
1107. Sharpened point for small game . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+
1108. Feathered . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1109. Featherless, for fish . . . . .	-	-	-	-	-	-	-	+	-	-	S	+	-	-	-	-	-	-	-	-
1110. Featherless, for wood-rat (note 62) . . . . .															+				+	+
1111. 3-barbed wood-rat arrow (note 62) . . . . .																+				
1112. Head, but no foreshaft . . . . .	+	-	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-
1113. For war . . . . .	+	-	S	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-
1114. For game . . . . .			+	+	-	+	+	+	+	+	+	+	+	+	+	-	+	+	+	-
1115. Foreshafted . . . . .	-	+	+	+	+	+	+	+	+	+	+	-	-	+	-	-	+	+	+	+
1116. Cane . . . . .	-	+	+	+	+	+	+	+	+	+	+	-	-	+	-	-	+	+	-	-
1117. Hardwood foreshaft, but no head . . . . .	-	+	+	+	+	+	+	+	+	+	+	-	-	+	-	-	+	S	+	+
1119. Thick blunt end, for birds, rabbit bits . . . . .	+	+	+	-	-	-	-	-	-	+	+	-	-	(+)	+	+	+	+	+	+
1120. Headless arrow for practice . . . . .	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+
1121. Rill on arrowshaft . . . . .	+	-	-	-	-	+	-	+	+	+	+	+	+	+	+	+	+	+	-	-
1122. Shaft painted near base . . . . .			+	+	+	+	+	+	+	+	+	+	+	-	+	-	+	+	-	-
1123. Pyrographic design by negative patterning . . . . .	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-
1124. Lightning design on shaft . . . . .	+	+	-	-	+	-	-	+	+	+	+	-	-	-	+	-	+	+	-	-
1125. Arrowheads: stone . . . . .	+	-	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+
1126. Bone . . . . .	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
1127. Tanged base . . . . .	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	(+)	-	-



	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
<u>Quivers; Spears; Shields;</u>																				
<u>Armor; Clubs; Slings</u>																				
1170. Quiver: cased skin (wildcat, coyote, etc.) . . . . .	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
1171. Open-skinned, sewn . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1172. Deer skin . . . . .	-	-	+	+	+	+	+	+	+	+	+	+	+	+	-	-	+	+	+	+
1173. Mt. lion . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	M	+	+	+	+	+	+
1174. Wildcat . . . . .	+	+	-	+	-	-	-	+	-	+	+	S	-	+	-	-	-	+	+	+
1175. Buckskin . . . . .	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	+	+	+	-	-
1176. Peccary skin . . . . .	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
1177. Separate pockets for bow and arrows . . . . .	-	+	+	S	-	-	-	+	+	+	+	+	+	-	+	-	+	+	-	-
1178. Bow strapped to outside of quiver with buckskin straps . . . . .	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1179. Quiver carried at side, under arm, in battle . . . . .	+	-	-	-	-	-	-	-	S	+	+	S	S	-	+	+	+	+	+	+
1180. Carried on back . . . . .	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	(+)	+	-	-
1181. Strap over both shoulders . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
1182. Belt to carry quiver . . . . .	-	-	-	S	-	-	-	-	-	-	-	-	-	-	+	-	+	+	+	+
1183. Spears: wholly of wood . . . . .	-	+	+	-	+	+	+	?	+	+	+	-	-	-	-	-	+	-	-	-
1184. Inserted hard-wood blade . . . . .	-	+	-	-	-	+	-	-	+	+	-	-	-	-	-	-	-	-	-	-
1185. Feather decoration . . . . .	-	-	-	-	-	-	+	+	+	+	+	+	+	-	-	-	+	+	-	-
1186. Used as flag . . . . .	-	-	-	-	-	-	+	-	-	+	-	+	+	-	-	-	-	-	-	-
1187. Nonflight obligation . . . . .	-	-	-	-	-	-	+	-	-	+	-	+	+	-	-	-	-	-	-	-
1188. Stone point . . . . .	?	-	-	-	-	-	-	?	+	+	+	-	-	-	+	+	-	+	-	-
1189. For war . . . . .	+	+	-	-	-	+	+	+	+	+	+	+	M	-	+	+	+	+	-	-
1190. For big game . . . . .	-	S	-	-	-	+	+	+	+	-	+	-	-	-	-	-	+	S	-	-
1191. Thrusting only . . . . .	+	+	+	-	+	+	+	+	+	+	+	+	+	-	+	+	+	+	-	-
1192. Bone point . . . . .	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	S	-	-
1193. Iron blade . . . . .	M	M	-	M	-	M	M	M	M	M	M	M	M	-	M	M	M	M	-	-
1194. Shields: circular, of mescal fiber . . . . .	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1195. Circular, of rawhide, made locally . . . . .	+	+	-	M	-	+	M	+	+	+	+	+	+	M	-	+	+	+	+	+
1196. Buffalo hide . . . . .	-	-	-	-	-	?	-	-	-	+	+	+	+	+	-	+	+	+	-	-
1197. Elkhide . . . . .	-	+	-	-	-	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1198. Painted (see fig. in Notes) . . . . .	+	+	-	+	-	+	+	?	+	+	+	+	+	+	-	+	+	+	+	+
1199. Cover of buckskin or cloth . . . . .	+	-	+	-	-	-	-	+	+	+	+	+	-	-	-	+	-	+	-	-
1200. Feather decoration (see fig. in Notes) . . . . .	+	+	-	+	-	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+
1201. Curtain shield of buckskin . . . . .	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1202. Armor: war cap, buckskin, feathers, etc. (nos. 1382. 2711) . . . . .	+	+	+	+	+	+	+	+	+	-	-	+	-	-	-	+	-	+	+	+
1203. War bonnet, short (Plains type) . . . . .	-	-	-	-	-	-	-	-	-	+	+	+	+	(M)	-	-	-	-	-	-
1204. Armor of hide . . . . .	-	-	-	+	-	-	-	+	-	+	-	-	-	-	-	-	+	+	-	-
1205. Broad abdominal buckskin belt . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
1206. Clubs: grooved ax or hammer as club; rawhide lashing in groove . . . . .	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	S	-	-
1207. Stone and stick encased in rawhide . . . . .	+	-	-	-	+	+	+	+	+	+	+	-	+	-	S	-	-	+	-	-

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
1209. Boomerang (curved throwing-club) . . . . .	-	-	-	-	-	-	-	+	+	-	(+)	-	-	+	+	+	+	+	-	-
1210. For rabbit killing . . . . .	-	-	-	-	-	-	-	+	+	-	-	-	-	+	+	+	+	+	-	-
1211. Flat . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	+	-	-
1212. Roundish in cross section . . . . .	-	-	-	-	-	-	-	+	+	-	-	-	-	-	S	-	-	-	-	-
1213. Impromptu . . . . .	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	S	-	-	-
1214. Straight throwing-stick for rabbits, etc. . . . .	+	+	+	+	+	-	+	S	+	+	+	+	+	-	S	S	S	S	+	+
1214a. Potato-masher type wooden club . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
1215. Ball-ended club . . . . .	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-
1216. For war . . . . .	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-
1217. For killing game . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-
1218. Feathered crook for neck of enemy . . . . .	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-
1219. Slings . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	M	+	+	+	+	+	+
1220. Boy's toy . . . . .	+	-	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+
1221. For bird killing . . . . .	+	+	+	+	+	+	S	+	+	-	+	+	+	-	+	+	+	+	+	+
1222. For crop protection . . . . .	+	+	+	-	+	+	+	+	-	+	-	-	-	-	+	+	+	+	+	+
1223. For war . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	-	-
BEADS AND ORNAMENTS																				
1224. Shell: disk beads . . . . .	+	+	+	+	+	+	+	+	+	+	+	-	+	-	+	+	+	+	-	-
1225. Made . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
1226. Imported . . . . .	+	+	-	-	-	-	S	S	S	S	-	-	+	-	+	-	-	-	-	-
1227. Found in ruins, etc. . . . .	+	+	+	+	+	+	+	+	+	+	+	-	-	-	+	S	-	-	-	-
1228. Clam . . . . .	?	+	?	S	?	?	?	?	?	?	?	-	-	-	(+)	+	+	+	-	-
1229. Olivella . . . . .	+	+	?	-	?	+	+	+	+	+	+	-	-	-	(-)	+	+	+	-	-
1230. Necklaces . . . . .	+	+	+	+	+	+	+	+	-	-	-	-	-	-	+	+	+	+	-	-
1231. Bracelet . . . . .	-	-	-	-	-	-	-	+	+	S	S	-	-	-	-	+	+	+	-	-
1232. From ears . . . . .	+	-	+	+	-	-	-	-	+	-	+	-	-	-	-	+	+	-	-	-
1233. Cylindrical beads . . . . .	-	+	+	-	+	+	-	-	-	-	-	-	-	-	-	+	-	+	-	-
1234. Shell ring . . . . .	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-
1235. Whole shells: Olivella . . . . .	+	+	+	+	+	-	+	+	+	+	+	-	-	-	-	+	+	+	(+)	-
1236. Conus . . . . .	+	+	+	+	-	+	+	+	-	-	-	+	-	-	-	+	+	-	(+)	-
1237. Pecten . . . . .	-	+	+	+	-	+	+	-	-	-	+	-	-	-	-	+	+	-	-	-
1238. Chione (?) or Glycimeris . . . . .	+	-	+	+	-	+	-	-	-	-	+	M	-	-	-	+	+	+	(+)	-
1239. Haliotis pendant (see fig. in Notes) . . . . .	-	+	M	M	+	M	M	+	+	+	+	+	+	-	+	+	+	+	-	-
1240. Haliotis inlay . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
1241. Red shell beads . . . . .	+	-	-	-	-	-	-	+	+	+	+	+	+	-	+	+	+	+	-	-
1242. Bone: beads . . . . .	-	-	+	-	-	-	-	-	-	+	+	-	-	-	-	+	-	-	-	-
1243. Bone breast ornament (Plains), imported . . . . .	-	-	-	-	-	-	-	-	-	+	+	-	+	M	-	-	-	-	-	-
1244. Wood: solid nose stick . . . . .	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1245. Feathers: on tunic (eagle feather) . . . . .	-	-	-	-	-	+	+	S	-	-	-	-	-	-	-	-	-	-	-	-
1246. In nose . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
1247. In hair . . . . .	+	-	-	-	-	-	-	S	-	+	+	+	+	S	S	-	+	+	-	-
1248. On buckskin string . . . . .	-	-	-	-	+	-	-	S	S	+	-	-	-	-	-	-	-	-	-	+
1249. Eagle-quill beads . . . . .	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1250. Turkey beard pendant . . . . .	+	-	-	-	-	-	-	-	-	+	+	-	-	-	-	+	-	+	-	-
1251. Seed beads . . . . .	+	-	-	-	-	-	-	-	-	+	+	-	-	+	+	+	-	-	-	+
1252. Claws and hooves: mt.-lion claw pendant . . . . .	-	-	-	-	-	+	-	-	-	+	-	+	-	-	-	+	-	-	-	-
1253. Bear-claw necklace or pendant . . . . .	+	-	-	+	-	+	+	-	-	+	+	-	-	-	-	+	+	-	-	-
1254. Badger-claw necklace . . . . .	-	-	-	-	-	-	-	-	-	-	-	+	+	-	+	+	-	-	-	-



	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
1296. Marrow with paint for face and body . . . .		+						+	+	+	+	+	+	+	+	+	+	+	+	+
1297. Paint applied to body by fingers . . . . .	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1298. Applied with rag, etc..															-	S	+	+		
1299. Applied with stick . .	-	-	+	+	+	+	-	-	-	S	-	-	-	-	-	-	S	S		-
1299a. Negative pattern by scraping off paint .		-		+		+	+	+	+	-	-	+	+	-	+	-	+	+		-
1300. Red paint and fat to protect from chapping . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-		-
1301. White paint without fat for flies or mosquitoes . . . . .		+	+	+	-	-	-	+	-	-	-	-	-	+	-	+	+	+		-
1302. Face and body paint to prevent sunburn .	+	+	+	+	+	-	-	+	-	+	+	-	-	+	-	+	+	+		-
HAIR, BODY MUTILATIONS, AND DRESS																				
<u>Beard and Hair</u>																				
1303. Beard: plucked with fingernails . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1304. With lump of warmed pitch (plaster) . . . .		+				+	+	-	-	-	-	-	-	-	-	+	-	-	-	-
1305. With stone flake and fingernail . . . . .	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	S		-
1306. With tweezers . . . . .	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	+	+		-
1307. Eyebrows completely plucked by both sexes . . . . .	-	-	-	-	-	-	-	-	-	+	+	+	+	+	-	-	-	-		-
1308. Hair: men banded at eyebrows .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+		-
1309. Women banded at eyebrows . . . . .	-	-	+	+	+	+	+	-	-	-	-	-	-	-	-	-	+	+		-
1310. Men wore full length . . . . .	+	+	+	+	S	+	+	+	+	+	+	+	+	+	+	+	+	+		-
1311. Men wore shoulder length . . . . .	-	-	-	+	S	-	-	-	-	-	-	-	-	-	-	-	+	+		-
1312. Loose at sides but cut halfway to shoulder (mouth level) . .	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	+	+	-		M
1313. Women wore full length.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+
1314. Women cut slightly in mourning . . . . .																				+
1315. Shoulder length . . . . .	-	-	-	-	+	-	-	-	S	-	S	-	-	-	-	-	-	-		-
1316. Mouth level . . . . .	-	-	+	+	-	-	-	+	S	S	S	-	-	-	-	-	-	-		-
1317. Close-cropped . . . . .	-	-	-	-	S	+	+	-	S	-	-	-	-	-	-	-	-	-		-
1318. Men dock slightly in mourning . . . . .	-	-	-	-	-	-	-	-	S	+	+	-	-	+	-	-	-	-		-
1319. Mouth level . . . . .	-	-	+	-	+	+	+	+	S	S	-	-	-	-	-	-	-	-		-
1320. Singed with glowing ember . . . . .	-	-	-	-	?	?	?	-	-	+	-	-	-	-	-	+	?	?		?
1321. Cut with stone knife .	+	+	+	+	?	?	?	+	?	+	+	-	-	+	-	+	?	?		?
1322. After recovery from long illness . . . . .		+													-	+	?	?		-
1323. Cut with cane knife . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-		?
1324. Parted in middle, men .	-	-	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-		+
1325. Parted in middle, women . . . . .	-	-	+	+	+	+	+	+	+	+	+	+	+	-	+	+	-	-		+
1326. One tie at back of neck . . . . .	-	-	+	S	+	+	+	+	+	S	S	-	-	-	-	-	S	-		+

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	WA	Zu	SA	SI	KP	HP
1327. Women only . . .	-				+		+	+	+	-	+	-	-	-	-	-	-	-	-	+
1328. Twisted, tied in bundle on back . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-
1329. Part painted red, both sexes . . . . .	-										+	+	+	-	-	-	-	-	-	-
1330. Men wear in 1 folded club . . . . .	+	+	S	-	-	-	-	+	-	-	-	-	-	-	+	+	+	+	+	+
1331. Wrapped and hung over neck	+	+	S	-	-	-	-	+	-	-	-	-	-	-	+	+	+	+	+	+
1332. Girls wear in folded club, tied in middle (Navaho style) . . . .	+	+	+	-	-	+	+	+	+	+	+	-	-	-	-	-	+	-	-	-
1333. Married women also . . . . .	+	+						S	-	+	+	-	-	-	-	-	+	-	-	-
1334. Unmarried women, in two folded clubs . . . . .	-											+	+	-	-	-	-	-	-	-
1335. Women wear in 1 braid . .	-	-	+	S	+	+	-	-	-	+	+	-	-	-	-	-	-	-	-	-
1336. In 2 braids . . . . .	-	-	-	-	+	-	-	-	+	+	+	+	+	-	-	-	-	-	-	+
1336. Men's braids wrapped with fur or buckskin . .	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-
1337. Men's rolls wrapped with fur . . . . .	-									+	+	-	-	-	-	-	-	-	-	-
1338. Men tie club with yarn . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-
1340. Women tie club with yarn . . . . .															-	+	+	+	-	-
1341. Girls only wear in whorls over ears . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
1342. Married women wear in long wrapped rolls . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	+	-	-
1344. Hair ornaments: man's headband .	+	+	+	+	+	+	+	+	+	-	-	-	S	-	+	M	+	+	+	+
1345. Buckskin . . . . .	+	-	+	S	+	+	+	?	+	-	-	-	S	-	-	-	S	+	+	+
1346. Fur . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	S	+	-	-
1347. Woven-band hair (club) tie . . . . .	-	M	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	+	-	-
1348. Buckskin hair tie . . . .	+	+	+	-	-	+	-	-	+	+	+	-	-	-	-	-	+	+	+	+
1349. Pendants in hair . . . . .	-	+	-	-	-	-	+	+	+	+	-	+	+	+	-	-	-	-	+	+
1350. Figure-8 ornament for girls . . . . .	-		+	-	-	M	M	+	+	-	+	-	-	-	-	-	-	-	-	-
1351. Flowers in hair, women . .	-	-	S	S	S	+	+	+	+	+	+	-	-	-	-	-	-	-	-	+
1352. Birdskin on hair . . . . .	-					-	+	+	+	+	-	-	-	-	-	-	-	-	-	-
Various Practices																				
1353. Special disposal of hair comb- ings or cuttings . . . . .	-	+	+	+	+	S	+	S	S	+	+	-	-	+	-	+	+	+	+	+
1354. Hair washed with yucca suds . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1355. Hair greased with fat or marrow.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1356. Louse killer of 5 beveled thin sticks . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
Body Mutilations																				
1357. Ear lobe bored, boys and girls .	+	+	+	+	-	M	M	+	+	+	+	+	+	M	+	+	+	+	+	S
1358. Girls only . . . . .	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1359. Babies . . . . .	+	+						S		+	+	+	+	-	+	+	-	-	+	+
1360. Children . . . . .	-									+	+	-	-	-	-	-	+	+	+	+
1361. Wood or spine to bore . . . .	+	-	+	-	-	-	-	-	+	+	S	-	-	-	+	+	+	+	+	+
1362. Bone awl . . . . .	+	+	+	-	+	-	-	+	-	-	+	+	+	-	-	-	-	-	-	-
1363. Multiple ear holes . . . . .	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	S	-	-	-	-
1364. Nasal septum bored . . . . .	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	S	-	-	-	-

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
1365. Intentional head deformation by cradle pad . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1366. Nose straightening . . . . .	+	+	-	-	+	+	+	+	-	+	+	+	-	+	-	+	-	+	+	+
1367. Tattoo: both sexes (forehead, arm, eyelid) . . . . .	-	-	-	-	-	-	-	+	+	+	+	-	-	M	-	-	-	-	-	+
1368. Men only (chest) . . . . .	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
1369. Women only (cheek, chin, arm) . . . . .	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+
1370. Women tattooed before puberty . . . . .	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-
1371. After puberty . . . . .	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	+
1372. Cactus-spine needles . . . . .	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	+
1373. Black pigment . . . . .	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	+
1374. Red clay pigment . . . . .	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-
<u>Ear Ornaments</u>																				
1375. Haliotis pendant . . . . .	-	-	-	-	+	-	M	+	M	+	+	+	+	-	+	+	+	+	-	-
1376. Turquoise beads . . . . .	+	S	-	+	-	-	+	-	-	+	+	+	+	-	+	-	+	-	-	-
1377. Turquoise pendant . . . . .	+	+	-	-	-	-	-	-	+	+	+	+	+	-	+	+	+	+	-	-
1378. Stick of wood . . . . .	-	+	-	-	-	-	-	-	+	+	+	S	S	-	S	+	S	-	-	-
1379. Birdskin . . . . .	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
1380. Olivella (whole) . . . . .	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	(+)
<u>Clothing</u>																				
Headgear (see also nos. 1202, 1203, 2711):																				
1381. Fur cap, men . . . . .	+	+	+	+	-	-	-	-	-	+	+	-	-	-	-	-	+	-	-	-
1382. Buckskin cap with feathers (nos. 1202, 2711) . . . . .	+	+	+	+	+	+	+	+	+	-	-	+	-	-	-	+	-	+	+	+
1383. "Shaman" only wore . . . . .	-	-	-	-	+	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-
Robes, shawls, and capes (over shoulders):																				
1384. Hide, hair on . . . . .	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	-
1385. Buckskin (dehaired) . . . . .	+	-	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	+	-
1386. Painted . . . . .	+	-	+	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
1387. Woven rabbitskin (technique under Textiles). . . . .	-	+	+	S	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-
1388. Bedding . . . . .	-	+	+	+	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-
1389. Woven vegetable fiber (twined) . . . . .	-	-	-	-	+	-	-	-	-	S	-	-	-	+	-	-	-	-	-	-
1390. Poncho (split in middle) . . . . .	+	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	+	-	-	-
1391. Woman's shawl of woolen material . . . . .	+	+	-	-	-	-	-	+	-	-	-	-	M	-	+	+	+	+	-	-
1392. Man's robe of woolen material . . . . .	-	-	-	-	-	-	-	+	-	-	-	-	M	-	+	+	+	+	-	-
1393. Robe of cotton cloth . . . . .	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	S	+	-	+	-
Shirts and gowns:																				
1394. Men's shirts or tunics: buckskin, kimono short sleeve . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	-	-	-
1395. Buckskin, sleeved . . . . .	+	+	+	+	+	M	+	+	+	+	+	+	+	-	+	+	+	+	+	+
1396. Tied together at neck opening . . . . .	+	-	+	+	+	+	+	+	+	+	-	+	-	+	-	-	-	-	-	+
1397. Open all way down front . . . . .	S	-	-	-	+	+	+	S	-	-	S	-	-	+	-	-	-	-	-	-
1398. Shirt painted yellow . . . . .	?	-	-	-	-	-	-	+	+	+	-	+	-	-	-	-	+	+	+	S

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
1399. Shirt painted white . . . . .	-									+		+	+	-	-	S	+	+	-	
1400. Shirt painted red-brown . . . . .	-	?	+			+	-	-	-	+	+	+	-	-	-	S	+	+	S	
1401. Shirt painted orange . . . . .		?			+	+	-	-	-	-	+	-	-	-	-	-	+	-	-	
1402. Painted design on shirt . . . . .	S	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	
1404. Fringed . . . . .	+	+	+	-	+	+	+	S	+	+	+	+	+	-	+	+	+	+	-	
1405. Porcupine-quill embroidery . . . . .		S									+	S	S	-	-	-	-	+	-	
1406. Cotton shirt . . . . .															+					+
1407. Woolen shirt . . . . .															+		+			-
1408. Women's tunics: under shirt, sleeveless . . . . .										+	+	-	-	-	-	-	-	-	-	-
1409. Short-sleeved tunic . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
1410. Open part way in front . . . . .	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
1411. Poncho-like short tunic of buckskin, not fringed, worn with skirt . . . . .		S			+	-	+	+	+	+	+	-	-	-	-	-	-	-	-	-
1412. Ditto, fringed . . . . .	+	+			+	+	M	+	+	+	+	-	-	-	-	-	-	-	-	-
1413. Women's gowns (from neck): poncho-like long tunic dress with neck and arm holes, of buckskin (kimono sleeve) . . . . .	-	-	+	+	-	-	-	-	-	+	+	+	+	+	-	-	-	-	-	-
1414. Dyed red-brown (alder) . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1415. Painted white . . . . .	-		-									+	+	-	-	-	-	-	-	-
1416. Yucca-fiber gown, sleeveless . . . . .		+													-	-	-	-	-	-
1417. Pueblo woven dress: open at left shoulder . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
1418. 2 tassels at right shoulder . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
1419. Twill woven . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
1420. Wool . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
Loin covering:																				
1421. Belts: buckskin . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1422. Rawhide for women's dress . . . . .		-										+	+	-	-	-	-	-	-	-
1423. Braided yucca or agave fiber . . . . .	-	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1424. Woven, for women . . . . .	+	M	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+
1425. Cotton . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	+	+
1426. Wool . . . . .	+	M	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	-
1427. Cord only . . . . .	+	?	+	-	+	-	-	-	+	-	-	-	-	-	-	+	+	-	-	-

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
1428. Breechclouts: buckskin, etc. . . . .	+	+	+	+	+	+	+	(+)	+	M	+	+	+	+	-	-	-	-	+	
1429. Woven juniper bark . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1430. Woolen cloth . . . . .															+	+	+	+	-	
1431. Cotton cloth . . . . .																		+	+	
1432. Ends form 2 aprons . . . . .	+	-	+	+	+	+	+	+	+			+	+	+	+	+	+	+	+	+
1433. Aprons and kilts for men: cotton or wool apron . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	
1434. 2-piece (front, back) . . . . .																+				
1435. Woven kilt as cere- monial garment . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	
1436. Tassels at corners of apron or kilt . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	
1437. Kilt a cloth wrapped around waist . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	
1438. Kilt a skin wrapped around waist . . . . .	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	S	-	-	-	
1439. Women's skirts: front and back aprons . . . . .	-	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1440. Of buckskin, unfringed . . . . .	-	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1441. Worn as under- skirt . . . . .	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1442. Breasts not covered . . . . .	-	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1443. 1-piece skirt: of juniper bark . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1444. Of cotton cloth . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
1445. Of buckskin, not fringed . . . . .	+	-	-	+	-	+	-	+	+	+	+	-	-	-	-	-	-	-	-	
1446. Of buckskin, fringed . . . . .	+	+	-	+	+	+	-	+	+	+	+	-	-	-	-	-	-	-	-	
1447. With fawn dewclaws on fringe . . . . .	-	-	-	-	-	+	-	-	(+)	S	+	-	-	-	-	-	-	-	-	
1448. Buckskin underskirt . . . . .	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	
1449. Mittens: fur . . . . .	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1450. Buckskin leggings: men only wore	+	+	+	+	+	+	+	-	-	-	-	+	+	-	+	-	+	+	-	
1451. Knee length . . . . .	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	
1452. Hip length . . . . .	-	+	+	+	+	+	+	-	+	+	+	+	+	+	+	-	+	+	-	
1453. Wrapped about leg and tied with cord . . . . .	-	-	-	-	-	-	-	-	-	-	-	+	+	-	+	-	-	-	-	
1454. Fringed . . . . .	-	+	+	S	+	+	-	-	-	S	+	+	+	-	+	-	+	+	-	
1455. Winged . . . . .		S									+	-	-	+	-	-	+	+	-	
1456. Pueblo women's spiral buckskin calf wrapping . . . . .	M	M													+	+	+	+	-	
1457. Footless stockings for women (Spanish) . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	
1458. Footless stockings for men (Spanish) . . . . .	+	M	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	
1459. Footgear: hard-soled moccasins . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	
1460. 2-piece . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	-	+	-	
1461. 3-piece . . . . .	M	M	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	-	
1462. Men's moccasins, short tops . . . . .	+	+	+			+		+		+	+	+	+	+	+	+	+	+	-	
1463. Women's knee length, or with high folded-down tops . . . . .	-	-	+	+	+	+	M	+	+	-	+	+	+	-	-	-	+	+	-	

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
1464. Men's moccasins, knee length . . . . .	-	-				+	-	+	M	-	-	-	-	-	-	-	-	-	-	-
1465. Buskins reaching knees worn in winter . . . . .	-	-	+	-	-	+	-	+	+	-	-	-	-	-	(+)	+	-	-	-	-
1466. Rabbit-fur socks (or in-soles) . . . . .		+	+		-	-	-	+	+	-	+	-	-	-	-	-	+	+	-	-
1467. Juniper-bark insole in winter . . . . .		+	+			+		+	+	-	-	+	+	+	-	-	-	-	-	-
1469. Part of old manta for insole . . . . .															+					-
1470. Fur moccasin for winter . . . . .	+	-			-	-	-	-	S	-	-	-	-	-	+	-	+	+	-	-
1471. Hide overshoes . . . . .		-						+	+	+	+	-	-	-	-	-	+	-	-	-
1472. Porcupine-quill embroidery . . . . .															+		+			-
1473. Turned-up pointed toe, both sexes . . . . .															+		+			-
1474. Turned-up round dollar-size toe . . . . .	-	-	+	S	+	+	M	+	M	-	-	-	-	-	-	-	-	+	-	-
1474a. Women only . . . . .	-	-	+	-	+	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-
1475. Deer-head or -neck skin . . . . .	+	-	+	+	+	+	+	+	+	+	+	-	+	+	+	-	-	+	-	-
1476. Moccasin sole: buffalo hide . . . . .		-								+	+	+	+	+	-	S	-	S	-	-
1477. Other hide . . . . .	+	+	-	+	-	+	+	+	+	-	+	-	-	-	+	+	+	+	-	-
1478. Yucca-fiber "shoe" . . . . .	+	-	-		+	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-
1479. Sandals: rawhide . . . . .	-	+	+	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+
1480. Yucca leaf, plaited . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1481. Commonly barefoot (at home) . . . . .	-	+	S	+	?	-	S	+	+	S	+	-	-	+	+	+	S	+	+	+
1482. Snowshoes: of wood with crosspieces . . . . .			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
1483. Of bark, pointed at ends . . . . .	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1484. Grass-wrapped old moccasin . . . . .		+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BEDDING																				
1485. Mattress: hollowed ground . . . . .		-			+	+	+	+	+	+	-	-	-	+	-	-	-	-	-	-
1486. Pad of vegetable material . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+					+	
1487. Hides . . . . .	+	+	-	+	+	-	S	+	+	+	+	+	+	+	+	+	+	+		-
1488. Willow mat, rawhide twining (Plains type) . . . . .		-								+	+	-	-	-	-	-	-	-	-	-
1489. Yucca woven mat . . . . .	+	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+
1490. Tule woven mat . . . . .	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1491. Blankets: badger skins . . . . .		?	+	+	+	-	?	-	-	-	-	+	-	+	-	-	-	+	-	-
1492. Coyote skins . . . . .	-	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	+	-
1493. Foxskins . . . . .	-	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	+	-
1494. Wildcat skins . . . . .		+			+	?		-	-	+	+	+	-	+	+	-	-	+	-	-
1495. Deerskin . . . . .			+	+	+	+	+	+	+	+	+	S	-	+	-	-	-	+	-	-
1496. Buckskin (dehaired) . . . . .	+		S		+	+	+	+	+	+	+	-	S	-	-	-	-	-	-	-
1497. Antelope skin . . . . .		-			+			-	+	-	-	S	-	-	-	-	-	+	-	-
1498. Buffalo robe . . . . .		M										+	+	+	-	-	+	+	-	-
1499. Mountain-lion skin . . . . .	+			+	+	+	+	+	+	+	+	S	S	S	S	S	-	-	+	-
1500. Bearskin . . . . .	-			+	+	+	+	-	-	+	+	-	-	2	-	-	-	-	-	-
1501. Other animal skins . . . . .	+			+	+	+	+	-	+	-	+	+	-	-	-	-	-	-	-	-
1502. Rabbitskin (woven) . . . . .		+	+	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-
1503. Woven plant fiber . . . . .	+	+			+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
1504. Woven wool or cotton . . . . .	+	M	-	-	-	+	+	+	-	-	-	-	-	-	+	+	+	+	+	+

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
SITTING POSTURES, GREETINGS, ETC.																				
1505. Men sat crosslegs (Turkish) . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	S	-	+	
1506. Women sat with legs stretched . .	+	+	+	+	+	+	+	+	+	+	-	+	+	+	S	+	+	+	+	
1507. Men sat with legs stretched . . .	-	S	-	+	+	+	+	+	+	+	-	+	+	+	S	-	-	-	-	
1508. Men sat with 1 leg out, 1 under .	+	+	+	+	+	+	+	+	+	+	S	-	+	+	S	-	S	S	S	
1509. Men knelt sitting on heels . . .	+	+	+	+	+	+	-	-	+	+	+	+	+	-	-	+	+	-	-	
1510. Women knelt sitting on heels . . .	+	+					-	-	+	+	+	-	-	+	+	+	-	+	+	
1511. One leg folded back, other knee up . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
1512. Men sat on buttocks, knees up . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
1513. Women sat with feet curled under . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	
1514. Men squatted flat-footedly . . .	M	+	+	+	+	+	+	+	+	+	+	-	-	+	+	+	-	+	+	
1515. Men rest standing, 1 foot vs. knee . . . . .		+	+		+	+	?	+	+	+	+	-	-	S	+	+	-	-	+	
1516. Stool, block, or ledge—men . . .	-	-	+	-	+	+	+	+	+	+	+	-	-	-	+	+	+	+	+	
1517. Stool, block, or ledge—women . .	-	-	-	-	-	S	?	+	+	+	+	-	-	-	+	+	+	+	+	
1518. Tear salutation . . . . .	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
1519. Embrace . . . . .	+	+	+	-	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	
1520. Hand shake (old) . . . . .	-	+	-	-	-	-	-	+	-	-	-	+	+	-	+	+	+	+	+	
1521. Kissing . . . . .	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	
1522. Meals 2 . . . . .	+	+	+	+	+	+	+	+	+	+	-	-	-	+	-	+	+	S	+	
1522a. Meals 3 . . . . .	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	+	-	
1523. 1 meal (morning) only . . . . .	-	S	-	S	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	
1524. Avoid sleeping head to E . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	
1525. Walking stick for elderly person.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
BURDENS																				
1526. Distance travel by running (trot) . . . . .	S	+	S	S	S	-	-	S	S	S	S	S	+	+	+	S	+	+	+	
1527. Men carry some property when traveling . . . . .	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
1528. Pole for carrying load . . . . .	-	-	+	-	-	-	-	-	S	-	-	+	-	-	-	+	-	S	-	
1529. For disabled: stretcher of buckskin . . . . .	-	+			+			+	S	S	S	-	+	-	-	-	-	-	-	
1530. Litter (ladder-like) . . . . .	+	+	-	-	-	+	+	+	S	-	S	+	+	-	-	-	-	+	+	
1531. Litter with yucca-leaf cross ties . . . . .	+							+	+	S	-	-	-	-	-	-	-	S	-	
1532. Carry person on back with blanket or rope sling . . . . .	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
1533. Load poised on shoulder . . . . .	+	S	+	+	-	-	+	S	S	S	+	S	S	S	S	+	S	S	S	
1534. Head carrying by women . . . . .	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	
1534a. Head carrying by men . . . . .	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	
1535. Water . . . . .	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	
1536. Headring . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	
1537. Wrapped . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	
1538. Braided, of narrow- leafed yucca . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	
1539. Water carrying in pottery jar . .	-	+	-	+	-	-	-	-	S	-	+	-	S	+	+	+	+	+	+	
1540. In pitched basket jar . . . . .	+	+	+	+	+	+	+	+	+	+	-	+	+	+	-	+	+	+	-	
1541. In gourd canteen . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
1542. In paunch, bladder, gut . .	-	+	+	-	+	S	S	S	S	+	S	-	-	+	-	-	S	-	-	
1543. In skin bag . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	S	-	+	-	
1543a. Pack strap . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
1544. Across head . . . . .	+	+	+	+	+	+	+	+	+	-	-	S	-	-	-	+	-	+	+	
1545. Forehead pro- tected . . . . .	+	-	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-	+	
1546. Across shoulders, chest . .	+	+	+	+	+	S	S	S	S	+	+	+	+	+	+	S	+	+	-	
1547. Over one shoulder, under other arm (bandoleer) . . . . .	+	+	+	-	+	+	+	+	+	+	+	+	+	-	S	+	S	+	S	





	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
1610. Twining . . . . .	+	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	+	-	-
1611. Counterclockwise, looking into basket . . . . .	-	-	+	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-
1612. Clockwise, looking into basket . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
1613. Plain, 2 strand . . . . .	-	+	-	+	+	+	+	+	?	+	-	-	-	-	-	-	-	-	+	-
1614. Close work . . . . .	-	+	-	+	+	+	+	+	?	+	-	-	-	-	-	-	-	-	(+)	-
1615. Enclosing 1 warp . . . . .	-	+	-	+	+	+	+	?	?	+	-	-	-	-	-	-	-	-	+	-
1616. Enclosing 2 warp . . . . .	-	+	-	+	+	+	+	+	?	+	-	-	-	-	-	-	-	-	-	-
1617. Openwork . . . . .	-	-	-	-	?	-	-	-	?	-	-	-	-	-	-	-	-	-	+	-
1618. Diagonal, 2-strand, close-work . . . . .	-	(+)	+	+	+	+	+	?	+	?	-	-	-	-	-	-	-	-	-	-
1619. 3-strand for reinforcing . . . . .	-	?	+	+	-	-	-	-	+	+	-	-	-	-	-	-	+	-	-	-
1620. Wicker . . . . .	+	+	+	-	?	+	+	?	?	?	-	-	-	-	+	+	(+)	-	-	-
1621. With parallel warps . . . . .	(+)	+	+	-	?	+	+	?	?	?	-	-	-	-	+	+	-	-	-	-
1622. With radiating warps . . . . .	(+)	?	-	-	?	-	-	?	?	?	-	-	-	-	-	+	-	-	-	-
1623. Twilling . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	+	+
1624. Twilled tray with wooden-withe border . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	-	-
<u>Basket Types</u>																				
1625. Seed beater . . . . .	-	-	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
1626. Twined, parallel warps . . . . .	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
1627. Oval . . . . .	-	-	-	+	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
1628. Wicker . . . . .	-	+	+	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
1629. Wedge-shaped (see fig. in Notes) . . . . .	-	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
1630. Bent to dry (string-tied) . . . . .	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
1631. Winnowing, sifting, and parching trays: circular, twined . . . . .	-	-	-	-	-	-	-	(S)	-	+	-	-	-	-	-	-	-	-	-	-
1632. Circular, twilled . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	-	-
1633. Circular, coiled . . . . .	+	+	+	+	+	+	+	+	+	+	-	+	+	+	-	-	+	+	+	+
1634. Circular, wicker, open-work . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
1635. Closework . . . . .	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	-	+	+	+	+
1636. Tray used for gambling . . . . .	+	-	+	+	?	?	?	-	-	-	-	-	-	-	-	-	-	-	-	-
1637. Coiled basket plaque . . . . .	-	-	-	-	-	-	-	+	-	-	-	-	+	-	I	-	-	-	M	-
1638. Coiled basket for boiling . . . . .	-	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-
1639. Carried by travelers . . . . .	-	+	+	+	-	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-
1640. Coiled basket cup . . . . .	-	+	+	+	-	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-
1641. Coiled basket for saguaro wine . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1642. Coiled basket food dish . . . . .	+	+	+	+	+	+	+	+	+	+	-	-	-	S	-	+	+	+	+	+
1643. Basketry water bottles (pitched) . . . . .	+	+	+	+	+	+	+	+	+	+	-	+	+	+	-	-	-	-	-	-
1644. Hourglass shape . . . . .	-	-	-	-	+	-	-	-	-	-	-	-	-	M	-	-	-	-	-	-
1645. Flat bottom . . . . .	+	+	+	+	+	+	+	+	+	+	-	+	+	+	-	-	-	-	-	-
1646. Concavity in bottom . . . . .	+	+	+	+	+	+	+	?	+	+	-	-	-	S	-	-	-	-	-	-
1647. Coiled . . . . .	+	+	+	-	-	+	M	+	-	-	-	+	+	+	-	-	-	-	-	-
1648. Diagonally twined . . . . .	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-
1649. Coated with red clay, etc. . . . .	+	+	+	+	+	+	+	-	+	+	-	-	-	S	-	-	-	-	-	-
1650. Pitched with piñon gum . . . . .	+	+	+	+	+	+	+	+	+	+	-	+	+	+	-	-	-	-	-	-
1651. Applied to outside with brush . . . . .	+	+	-	+	+	+	+	+	+	+	-	-	-	S	-	-	-	-	-	-

	WN	EN	NT	ST	SC	Gi	WM	WS	Hu	Me	Li	LJ	Ol	SU	Wa	Zu	SA	SI	KP	HP
1652. Melted pitch poured into basket . . . . .	+	+	+	+	+	+	+	+	+	+	-	+	+	+	-	-	-	-	-	-
1653. Hot pebbles to smooth inside pitch . . . . .	+	+	-	-	-	+	+	+	+	+	-	-	+	+	-	-	-	-	-	-
1654. Hot pebbles to stop leaks by remelting pitch.	-	+	+	+	+	+	+	+	+	+	-	-	+	+	-	-	-	-	-	-
1655. White clay rubbed on exterior . . . . .	-													+	-	-	-	-	-	-
1656. Wooden lugs . . . . .	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-
1656a. Lugs of other materials . . . . .	M	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-
1657. Corked with bark or foliage . . . . .	+	+	+	+	+	+	+	+	+	+	-	+	+	+	-	-	-	-	+	-
1658. Trinket baskets . . . . .	-	+	-	+	+	+	+	+	+	-	-	-	+	+	-	+	-	-	M	
<u>Miscellaneous</u>																				
1659. 3 colors (2 in pattern) . . . . .	+	+	+	+	+	+	-	+	+	+	-	+	+	+	-	+	-	+	M	
1660. More than 2 in pattern . . . . .	-	-	-	-	-	-	-	+	+	S	-	-	-	-	-	-	-	-	-	-
1661. Women made basketry . . . . .	+	+	+	+	+	+	+	+	+	+	-	+	+	+	-	+	-	S	+	
1662. Men made fine basketry . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	-	
1663. Men made rough baskets . . . . .	+	-	-	-	-	-	-	S	S	S	-	-	-	-	+	+	+	+	-	
1664. Berdaches made basketry . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	
1665. Break in annular basket design . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	
1666. Head washing from basket . . . . .	+	+	+	+	+	+	+	S	+	-	-	-	-	+	-	-	-	-	-	
<u>Tools and Materials for Basketry</u>																				
1667. Scraper of stone flake . . . . .	+	+	+	+	+	+	+	+	+	S	-	+	+	+	+	+	+	+	+	+
1668. 3-way splitting of stems . . . . .	+	+	+	+	+	+	+	+	+	+	-	+	+	+	-	+	-	+	-	-
1669. Mulberry shoots . . . . .	-				+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-
1670. Yucca root (red) for design . . . . .	+	-	+	+	+	+	M	+	+	+	-	-	-	-	-	-	-	-	M	
1671. Cottonwood . . . . .	-	+	+	+	M	+		-	-	-	-	-	-	-	+	-	-	-	M	
1672. Willow (Salix) . . . . .	+	-	+	+	-	-	-	+	+	+	-	+	+	-	-	+	+	+	+	+
1673. Whole stem . . . . .	+	-	+	-	-	-	-	+	-	+	-	+	+	-	-	+	-	+	+	+
1674. Split stem . . . . .	-	-	+	+	-	-	-	+	+	+	-	+	+	-	-	+	-	-	+	+
1675. Sumac . . . . .	+	+	+					+	+	+	-	-	?	+	+	+	+	+	-	-
1676. Martynia for design . . . . .	-	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	+	+	+
1676a. Tule . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+
1677. Yucca leaves . . . . .	+	+						+	+	+	-	+	-	-	+	+	+	+	+	(+)
1678. Coloring basket material . . . . .	+	+	+	-	+	-	-	-	-	-	-	+	+	+	-	+	-	S	-	+
MATTING																				
1679. Checker weave . . . . .	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	(+)	
1680. Twilled weave . . . . .	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	
1681. Twined weave . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	
1682. Sewed mat of tule stems . . . . .	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	
CRADLES (Lying Type)																				
1683. Soft juniper bark cradle, replaced monthly . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
1684. Board cradle . . . . .	+	M	-	-	-	-	-	-	-	-	+	-	+	-	-	+	+	M	-	-
1685. Rawhide altogether . . . . .	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-
1686. Wood . . . . .	+	M	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
1687. U-shaped frame cradle (see fig. in Notes) . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
1688. U-shaped ladder cradle . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
1689. Oval ladder cradle . . . . .	-	+	+	+	+	+	+	+	+	+	-	+	-	-	-	-	-	-	+	-
1690. Cross sticks extend out; buckskin lashings . . . . .	-	-	+	+	+	+	+	+	+	+	-	+	-	-	-	-	-	-	-	-
1691. Rawhide cross ties to form floor . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
1692. Frame buckskin-covered at sides . . . . .	-	-	-	-	-	-	-	-	+	+	-	+	-	-	-	-	-	-	-	-
<u>Various Details</u>																				
1693. At least 2 cradles before baby walked . . . . .	-	-	-	+	-	+	+	-	-	-	-	-	-	+	-	-	-	-	-	-
1694. Loops for lacing baby in . . . . .	+	+	+	+	+	+	+	+	+	-	-	-	-	+	+	+	+	-	-	-
1695. Through holes bored in frame . . . . .	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-
1696. Cords of buckskin for tying baby in . . . . .															+				+	-
1697. Footrest at bottom . . . . .	+	+	-	-	-	-	-	+	+	+	+	+	+	-	-	-	-	-	-	-
1698. Adjustable . . . . .		+	-	-	-	-	-		+	+	+			-	-	-	-	-	-	-
1699. Hood . . . . .	+	+	+	+	+	+	+	+	+	+	-	-	-	-	+	+	+	+	+	+
1700. 3 willow withes, collapsible (see fig. in Notes) . . . . .															-	+	+	+	+	-
1701. Basketry band . . . . .	-	+	+	+	+	+	+	+	+	+	-	-	S	-	+	-	-	-	-	+
1702. Parallel twigs, sticks beneath, fastened with sinew string twining . . . . .	-	+	-	+	+	+	+	+	+	+	-	-	+	-	-	-	-	-	-	-
1703. Wicker . . . . .	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
1704. Checker and twilling . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
1705. Hoop, flattened on 1 side . . . . .	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
1706. Rawhide . . . . .	-	-	-	-	-	-	-	-	-	-	-	+	S	-	-	-	-	-	-	-
1707. Hood adjustable . . . . .		+	-						+	+	-	-	-	-	-	+	+	+	+	-
1708. Skin drape . . . . .	+	+	+	+	+	?	+	+	+	+	+	+	+	-	-	-	-	-	-	-
1709. Cloth drape . . . . .		S	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+
1711. Cradle bedding: woolen blanket . . . . .															+	+	+	+	+	-
1712. Yucca-leaf mat . . . . .																				+
1713. Loose vegetable material . . . . .	+	+	+	+	+	+	+	+	+	+	+	-	-	+	-	+	-	-	-	-
1714. Animal skin . . . . .		-						+	+	+	+	+	+	-	-	+	+	+	+	-
1715. Swaddling clothes: of buckskin . . . . .	+	-	+	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
1716. Of fur . . . . .	+	-	+		+	+	+	+	+	+	+	+	+	-	-	-	-	-	+	-
1717. Of "cloth" . . . . .	-	+	-	-	+	-	-	-	-	-	+	-	-	+	+	+	+	+	+	+
1718. Belt (lashing) of buckskin . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-
1719. Of woven sash . . . . .															-	S	-	-	-	+
1720. Wound-around belt . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
1721. Tie string laced through loops . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-
1722. Hide pack strap . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-
1723. Carried hanging on back . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-
1724. Pack strap over head . . . . .	+	+	+	+	+	+	+	+	+	-	-	S	-	-	-	+	-	-	-	-
1725. Pack strap over shoulder-chest . . . . .	+	+	+	+	S	S	S	S	S	+	+	+	+	+	+	+	-	-	-	-



	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	O1	SU	Wa	Zu	SA	SI	KP	HP
1769. Horsehair . . . . .	+	M	-	-	M	-	-	+	-	+	-	-	S	-	+	-	-	+		
1770. Round (square) . . . . .		+	+	+		-	-	+	+	+	+	+	+	-	+	+	+	+		
1771. Flat . . . . .		+	+	+		-	-	+	+	+	+	+	+	+	+	+	+	+		
1772. 3-strand . . . . .	+	+	+			-	-	+	+	+	+	+	+	+	S	+	+	+		
1773. 4-strand . . . . .		+	+	+		-	-	+	+	+	+	+	+	-	+	+	+	+		
1774. 5-strand . . . . .	+					-	-								+	+				
1775. 6-strand . . . . .		+	+	+		-	-	+	+	+	+	+	S	-	+	+	+	+		
1776. 8-strand . . . . .		M	+	-		-	-	+	+	+	+	-	S	-	-	+	+	+		
1777. 12-strand . . . . .		M				-	-	+	+	+	+	-	S	-	-	+	+	S		
1778. For lariat . . . . .	-	-				-	-		+	+	+	+	+	-	+	M	+	M		
1779. Withes . . . . .	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+			-
1780. Nets . . . . .	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	M	+
1781. Made without needle or measure . . . . .	-	-	-	-	-	-	-	-	-	-	-	?	-	-	-	-	-	-	+	+
1782. Knitting, with wooden needles .	+	M	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-		
1783. By men . . . . .	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-		
1784. By women . . . . .	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-		
WOVEN RABBITSKIN BLANKETS																				
1785. Rabbitskin blankets (woven) . .	-	+	+	S		-	-	-	-	-	-	-	-	-	+	+	-	-		
1786. Skin strips twisted only from drying . . . . .	-	S	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-		
1787. Hand only to twist skin strips . . . . .	-	S	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-		
1788. Skin twisted over cord or wool yarn . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-		
1789. Warp of woolen strings . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-		
1790. Of rabbitskin twisted over string .	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-		
1791. Of yucca fiber . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
1792. Each warp tied separately . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-		
1792a. Wefts of rabbitskin . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-		
1793. Of buckskin . . . . .	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
1794. Woven lying on ground . . . . .	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
1795. Woven around 4 pegs in ground to form corners . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
1796. Frame vertical, weaving upward . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-		
1797. Checker weave . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-		
1798. Twined weave . . . . .	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
1799. Made by men . . . . .	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-		
1800. Made by women . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-		
1801. LOOM WEAVING . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+
1802. Fibers: cotton . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	S	+	+	+	+
1803. Switched with bowstring to rid of seeds .	-	-	-	-	-	-	-	-	-	-	-	-	-	-						+
1804. Wool . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+		-
1805. Spindle with wooden whorl . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+		-
1806. Wound on as made . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+		+
1807. Wrapped in ball later . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+		+
1808. Spindle with cross stick . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		+
1809. Men spun . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+		+
1810. Women spun . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+		-
1811. Loom vertical . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+		-
1812. Loom horizontal . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		+
1813. Men weave . . . . .	S	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	+	+

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
1814. Women weave . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
1815. Berdaches weave . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
1816. Vertical loom apparatus and manipulation: loom frame with 2 forked sticks at sides . . . .	+	S	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
1817. Horizontal top bar rests in forks . . . . .	+	S	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
1818. Bottom bar lies on ground . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
1819. Held down with stones . . . . .		+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
1820. Bottom bar totally or partly imbedded . . . . .	S	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-
1821. Wood loops in holes in floor to attach bot- tom bar . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-
1822. Bottom bar of loom serves as weight . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
1823. Blanket poles of rounded, smoothed sticks, 7-8 ft. long . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
1824. Ceiling beam to attach top bar . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+		+	+	-	-
1825. Batten stick . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
1826. Bobbin of wood . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
1827. Warps stretched on warp beams while lying on ground . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
1828. Wound over warp beams in con- tinuous strand . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
1829. End strands twined over warps before weaving begins . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-
1830. After weaving completed . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
1831. Warp strands cross each other at center . . . . .	?	?	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
1832. Warp strands held taut by spiral rope over top beam . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
1833. Border strands of heavy, strong cord . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
1834. Warp frame raised to vertical position after warp threaded . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
1835. 2 heald sticks for pull- ing warp strands for- ward and backward . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
1836. Yarn beam lowered by spirally wound rope . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
1837. Finished part of blanket sewed to lower loom pole during work . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	+	-	-
1838. Small batten sticks for use when blanket nearly completed . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
1839. Batten comb of hardwood, with awl end . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-
1840. Temple . . . . .			-	-	-	-	-	-	-	-	-	-	-	-	+		-	-	-	-
1841. Rug woven from both ends, finished in middle . . . . .			-	-	-	-	-	-	-	-	-	-	-	-		+	-	-	-	-

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
1841a. Belt-attached loom . . . . .	?	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
1842. Perforated reeds . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	+	-	-
1843. Warps carry design (see fig. in Notes).	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+		+		-	-
1844. Patterned belts . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
1845. Sashes . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-
1846. Garters . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-
1847. Hair cords . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-
1848. Belt loom in V-fork . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1849. Patterned belts . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1850. Sashes . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1851. Garters . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1852. Hair cords . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1853. Horizontal loom . . . . .	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
1854. Sand under loom . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
1855. 4 corner posts . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
1856. Yarn beams tied to out- side of posts . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
1857. Heald rod of arrowweed . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
1858. Bobbin of wood . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
1859. Batten of ironwood . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
1860. Twined selvage edge to engage weft threads . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
POTTERY																				
1861. Only women made (see fig. in Notes) . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	-	+	+	+	+
1862. Temper for clay . . . . .	+	+	+	+	+	?	+	-	+	+	+	-	-	-	+	+	+	+	+	+
1863. Sherd . . . . .	+	+	+	-	-	?	+	-	-	-	-	-	-	-	+	+	-	-	+	+
1864. Sand . . . . .	-	-	-	-	+	?	-	-	-	-	-	-	-	-	+	-	+	-	-	+
1865. Whitish mineral powder . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
1866. Vegetable material . . . . .	-	-	-	+	+	+	+	-	+	+	+	-	-	-	-	-	-	-	-	-
1867. No tempering (already in clay) . . . . .	-	-	-	-	-	?	-	-	?	?	?	+	+	-	M	-	-	-	-	-
1868. Bottom molded over knee into small saucer . . . . .	-	-	-	+	-	?	+	-	+	?	-	-	-	-	-	-	-	-	-	-
1869. Bottom molded over pot into small saucer . . . . .	-	-	-	S	-	-	-	-	-	?	-	-	-	-	-	+	-	+	+	+
1870. Bottom formed from ball of clay . . . . .	+	+	+	+	-	?	-	-	-	?	+	+	+	-	-	+	+	-	+	-
1871. Bottom started with small coil . . . . .	-	-	-	-	-	4	-	-	-	?	-	-	-	-	+	-	-	-	-	-
1872. Coiling . . . . .	+	+	+	+	+	+	+	+	+	?	+	+	-	-	+	+	+	+	+	+
1873. Without paddle and anvil . . . . .	+	+	+	+	+	+	+	+	+	?	+	+	+	-	+	+	+	+	-	-
1874. With fingers . . . . .	+	+	+	+	+	+	+	+	+	?	+	+	+	-	+	+	+	+	-	-
1875. Scraped . . . . .	+	-	+	+	+	+	+	+	-	?	+	+	+	-	+	+	+	+	-	-
1876. Smoothed with piece of gourd, sherd, etc. . . . .	-	+	+	+	-	-	+	+	+	?	+	-	+	-	+	+	+	+	-	-
1877. With paddle and anvil . . . . .	-	-	-	-	-	-	-	-	-	?	-	-	-	-	-	-	-	-	+	+
1878. Anvil a cobble . . . . .	-	-	-	-	-	-	-	-	-	?	-	-	-	-	-	-	-	-	-	+
1879. Polished with pebble . . . . .	+	+	-	-	+	-	-	-	-	?	-	+	+	-	+	+	+	+	+	+
1880. Slip . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+
1881. Slip white when applied . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
1882. Burns white . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-
1883. Burns yellow . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
1884. Slip red when applied; burns red . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+
1885. Slip yellow when applied; burns red . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP		
1886. Coated with piñon pitch after firing . . . . .		+													-	-	S	-	-	-	-	
1887. Painted designs . . . . .	-	+	-	-	7	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	
1888. Red before and after firing . . . . .		+																				
1889. Yellow when applied; red after firing . . .		-														+	-	+	-	-	-	
1890. Buff before and after firing . . . . .		-														-	-	+	-	-	-	
1891. Black before and after firing . . . . .		+														+	-	+	-	-	-	
1892. Mesquite black after firing . . . . .		-														-	-	-	-	+	+	
1893. Indentations or incisions . . .	+	+	-	+	-	+	+	+	-	+	-	+	+	-	-	-	S	-	+	-	-	
1894. Molded ornaments or parts . . .		+								?			+		+	+	-	+	+	+	+	
1895. Ring design broken . . . . .		-								?					+	+	-	+	-	-	-	
1896. Dove feather brush . . . . .																					+	
1897. Stick brush . . . . .		+						+	-	?											-	+
1898. Yucca-leaf brush . . . . .		+														+	+	+	+	-	-	
1899. Yucca-leaf or stick inciser . .		+						+	-	?						+	-				-	
1900. Firing in open fire . . . . .		+	+	+	+	?	+	+	+	+	+	+	+		+	+	+	+	-	+	+	
1901. Firing in pit . . . . .		-			+	?														+	-	
1902. Orifice up . . . . .		-	+	+	-	?		+	+	?	+					M				-	-	
1903. On side . . . . .		-			+	?	+			?										+	+	
1904. Bottom up . . . . .		+	+	-	-	?		-	-	?		+	+		+	+	+	+	-	-	-	
1905. Fuel: wood, dry foliage . . . .		+	+	+	+		+	+	+	?	+	+	+		-	-	-	+	+	+	+	
1906. Sheep manure firing fuel . . . .		+	M							?	?				+	+				-	-	
1907. Smoke firing (bucchero) with manures . . . . .		-	-	-	-	?		-	-	?						+	+	+		-	-	
1908. Molding or modeling . . . . .		+	-	+	+	?		+	S	?	+				+	+	-	+	-	+	+	
1909. Small objects only . . . . .		+	-	+	+	?		+	S	?	+				+	+	-	+	-	+	+	
1910. Effigy figures . . . . .		+	-	+	+	?		+	S	?	+				-	+	+	+	+	-	+	
1911. Fired . . . . .		-													+	+	-	+	-	+	+	
GAMES																						
1912. Football or stick race, 2 sides.		+	+	-	-	-	-	-	-	-	-	+	-		+	+	+	+	+	+	+	
1913. Men play . . . . .		+	+	-	-	-	-	-	-	-	-	-	-		+	+	+	+	+	+	+	
1914. Boys play . . . . .		+	+	-	-	-	-	-	-	-	-	+	-		S	S	S	S		S	S	
1915. Along a straight course.		+	+	-	-	-	-	-	-	-	-	+	-		-	-	-	-		+	+	
1916. In a circuit . . . . .		-	-	-	-	-	-	-	-	-	-	-	-		+	+	+	+		-	-	
1917. "Ball" to be touched only with foot . . . .		+	+	-	-	-	-	-	-	-	-	+	-		+	+	+	-		-	-	
1918. Short stick . . . . .		-	+	-	-	-	-	-	-	-	-	-	-		-	-	+	+		-	-	
1919. Wooden ball . . . . .		-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-		+	+	
1920. Stone . . . . .		-	-	-	-	-	-	-	-	-	-	-	-		+	-	-	-		-	-	
1921. Stuffed buckskin . . . . .		+	-	-	-	-	-	-	-	-	-	S	-		-	-	-	-		-	-	
1922. Ball of grass . . . . .		-										+			-	-	-	-		-	-	
1923. 1 "ball" to side . . . . .		+	+	-	-	-	-	-	-	-	-	-	-		+	+	+	+		+	+	
1924. Relay each other at will . . . . .		-		-	-	-	-	-	-	-	-	-	-		+	+	+	+		-	-	
1925. Sides are "summer," "winter" moieties . .		-	?	-	-	-	-	-	-	-	-	-	-		-	?	-	+		-	-	
1926. Sides are local groups . . . .		+	?	-	-	-	-	-	-	-	-	-	-		+	?	-	-		+	+	
1927. Goal: stick . . . . .		+	-	-	-	-	-	-	-	-	-	S	-		-	-	-	-		-	-	
1928. Line on ground . . . . .		-	+	-	-	-	-	-	-	-	-	S	-		+	-	-	-		+	+	
1929. Kiva top . . . . .		-	-	-	-	-	-	-	-	-	-	-	-		-	-	+	-		-	-	
1930. River . . . . .		-	-	-	-	-	-	-	-	-	-	-	-		-	+	-	+		-	-	
1931. Four-base game . . . . .		-	+	+	+	+	+	+	+	+	+	-	-		-	-	-	-		-	-	
1932. 2 teams . . . . .		-	+	+	+	+	+	+	+	+	+	-	-		-	-	-	-		-	-	
1933. Males play . . . . .		-	+	+	+	+	+	S	+	+	+	-	-		-	-	-	-		-	-	

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
1934. Mixed sexes . . . . .	-	-	+	-	-	+		S	S	-	+	-	-	-	-	-	-	-	-	-
1935. Females play . . . . .	-	-	S	+	-	+		S	+	+	+	-	-	-	-	-	-	-	-	-
1936. Entire team must make home run . . . . .	-	+	+	+	+	+		+	+	+	+	-	-	-	-	-	-	-	-	-
1937. Score by subtraction . . .	-	-	-	-	+			-	-	-	-	-	-	-	-	-	-	-	-	-
1938. Ball of corn husk . . . . .	-	-	+	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-
1939. Ball of buckskin . . . . .	-	+	-	+	+	+		+	+	+	+	-	-	-	-	-	-	-	-	-
1940. Circuit clockwise . . . . .	-	-	+	-	+	+		-	-	-	-	-	-	-	-	-	-	-	-	-
1941. Circuit counterclockwise.	-	+	-	+	-	-		+	+	+	+	-	-	-	-	-	-	-	-	-
1942. Batted with hand . . . . .	-	+	+	+	+	+		+	+	+	+	-	-	-	-	-	-	-	-	-
1943. Foul line behind home base . . . . .	-	-	-	-	-	+		+	+	+	+	-	-	-	-	-	-	-	-	-
1944. Three-base game, 5-10 players . .	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	+	-
1945. Ball batted with straight stick . . . . .	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	+	-
1946. Males only play . . . . .	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	+	-
1947. One at time makes home run . . . . .	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	+	-
1948. Ball of buckskin, buf- falo hair . . . . .	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	+	-
1949. Run counterclockwise . . .	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	+	-
Foot racing without "stick":																				
1950. Men and boys . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1951. Women and girls . . . . .	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	+
1952. "Relay race" by teams . . .	-	-	+	-	-	-		-	-	-	-	+	+	-	-	-	-	-	+	+
<u>"Shinny," evenly matched sides:</u>																				
1953. Men play . . . . .	+	+	+	+	+	+	+	+	+	+	+	-	-	+	+	+	+	+	+	-
1954. Women play . . . . .	-	-	-	-	-	+	-	+	+	+	+	-	-	+	-	-	-	-	+	+
1955. Mixed . . . . .	-	-	-	-	-	-		+	+	-	+	+	+	-	-	-	-	-	-	-
1956. Squash-knob ball . . . . .	-	-	-	+	-	-		-	-	-	-	-	-	-	-	-	-	-	-	+
1957. Wild gourd as ball . . . . .	-	+	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-
1958. 2 wooden balls tied to- gether . . . . .	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	+
1959. Stuffed buckskin ball . . .	+	M	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-
1960. Ball completely buried at start of game . . . . .	+	+	-	-	-	-		+	-	-	-	-	-	-	+	-	-	-	-	-
1961. Ball in hole, not covered at start of game . . . . .	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	+	-
1962. Ball dropped at center of field . . . . .	-	-	+	+	+	+	+	-	+	+	-	+	+	-	-	+	-	-	-	-
1963. Ball picked up and batted . . . . .	-	-	-	-	-	-		+	-	-	+	-	-	+	-	-	+	-	+	+
1964. Grappling permitted . . . . .	+	+	-	-	-	-		-	-	-	+	-	-	-	+	-	-	-	+	+
1965. Ball driven with curved stick . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1966. Ball driven with straight stick . . . . .	-	-	-	-	-	-		-	-	-	-	-	-	-	-	+	-	-	-	+
1967. Guard stick carried . . . . .	+			+	S	+		+	+	-	-	-	-	-	-	-	-	-	-	-
1968. Ball driven with feet also . . . . .	-	+	-	-	-	-		S	S	+	S	-	-	+	+	-	+	+	-	-
1969. 2 goals (lines on ground)	+	+	+	-	+	-		+	+	-	-	S	S	-	-	+	+	+	-	-
1970. 2 goals, bushes . . . . .	-	S	-	+	-	+	+	-	S	+	+	S	S	+	-	-	-	-	-	+
1971. 2 goals, rocks, which ball must touch . . . . .	-	-	-	-	-	-		-	S	+	-	-	-	-	+	-	-	-	-	+
1972. Sides are kivas . . . . .	-	-	-	-	-	-		-	-	-	-	-	-	-	+	-	-	-	-	-
1973. Sides are local groups . . .	-	-	-	-	-	-		S	-	S	-	-	S	-	-	-	-	-	-	+
1974. Betting . . . . .	-	+	-	-	+	+	+	+	+	+	+	-	+	+	-	+	+	+	+	+
<u>Hoop-and-pole ("pitching pole"):</u>																				
1975. Men only play (see figs. in Notes) . . . . .	+	+	+	+	+	+	+	+	+	+	+	-	+	-	-	-	-	-	-	-



	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
2011. "Shuttle cock" . . . . .															-	+	+	-	-	
2012. Maize cob-and-hoop (boys' game).															+					-
2013. Peon ("bones") game ("hand- game") . . . . .	+	(+)	-	-	-	-	-	-	-	+	+	+	+	M	-	+	+	+	+	+
2014. "Bones" cylindrical . . . . .	-	-	-	-	-	-	-	-	-	-	+	+	+		-	-	-	+	+	+
2015. Both bone . . . . .	-	-	-	-	-	-	-	-	-	-	-	+	S		-	-	-	+	-	-
2016. 1 marked with (string) . . . . .	-	-	-	-	-	-	-	-	-	-	-	+	+		-	-	-	-	-	-
2017. White guessed for . . . . .	-	-	-	-	-	-	-	-	-	-	-	+	+		-	-	-	-	-	-
2018. Wrist or finger loop . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	+
2019. Position of pairs guessed for . . . . .	-	-	-	-	-	-	-	-	-	+	+	+	+		-	-	-	+	-	-
2020. 1 pair on side . . . . .	-	-	-	-	-	-	-	-	-	+	+	S	S		-	-	-	+	-	-
2021. 2 pairs on side . . . . .	-	-	-	-	-	-	-	-	-	+	+	+	+		-	-	-	-	-	+
2022. Signal for both inside . . . . .	-	-	-	-	-	-	-	-	-	+	+	+	+		-	-	-	-	-	-
2023. Both outside. . . . .	-	-	-	-	-	-	-	-	-	+	+	+	+		-	-	-	-	-	-
2024. Both right . . . . .	-	-	-	-	-	-	-	-	-	+	+	+	S		-	-	+	+	(+)	-
2025. Both left . . . . .	-	-	-	-	-	-	-	-	-	+	+	+	S		-	-	+	+	(+)	-
2026. 1 pair of players . . . . .	-	-	-	-	-	-	-	-	-	-	-	S	S		-	+	S	S	-	-
2027. 2 pairs of players, or more . . . . .	-	+	-	-	-	-	-	-	-	+	+	+	+		-	-	+	+	+	-
2028. Single "bone" to player (1 hand empty) . . . . .	+	+	-	-	-	-	-	-	-	+	+	-	S		-	+	+	+	-	-
2029. Arranged behind back . . . . .	+	+	-	-	-	-	-	-	-	+	+	+	+		-	+	+	+	+	-
2030. Hiding in hands, crossed, under arm- pits . . . . .	-	S	-	-	-	-	-	-	-	S	S	S	S		-	-	-	S	+	-
2031. Number of counters, 102 . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-
2031a. Number of counters, 10, 12 . . . . .	-	-	-	-	-	-	-	-	-	+	-	+	+		-	-	+	-	-	-
2031b. Number of counters, 20 . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	+	-
2031c. No counters . . . . .	-	-	-	-	-	-	-	-	-	-	+	-	-		-	-	-	-	-	-
2032. Referee holds counters at start . . . . .	-	-	-	-	-	-	-	-	-	+	-	-	-		-	-	-	+	+	-
2033. Men only play . . . . .	-	-	-	-	-	-	-	-	-	-	-	+	+		-	+	+			-
Hidden-ball game (or moccasin game):																				
2035. With 4 sand heaps . . . . .	-	+	-	+	S	+	+	-	+	-	-	+	-		-	+	-	-	-	-
2036. With pile with 4 parts . . . . .	-	-	+	-	+	+	+	-	-	-	-	-	-		-	-	-	-	-	-
2037. Seeking ball at first (positive procedure) . . . . .	-	-	-	+	-	-	-	-	S	-	-	-	-		-	-	-	-	-	-
2037a. Seeking ball at last (negative procedure) . . . . .	-	+	+	-	S	+	+	-	S	-	-	-	-		-	+	-	-	-	-
2038. Number of counter sticks (14-40) . . . . .	-	-	+	+	+	+	+	-	-	-	-	-	-		-	-	-	-	-	-
2038a. Number of counter sticks (54-104) . . . . .	-	+	-	-	-	-	-	-	+	-	-	+	-		-	-	-	-	-	-
2038b. Number of counter sticks (150) . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-		-	+	-	-	-	-
2039. In neutral pile at start . . . . .	-	+	+	+	+	+	+	-	+	-	-	-	-		-	+	-	-	-	-
2040. Blanket conceal- ment in hiding . . . . .	-	+	+	+	+	+	+	-	+	-	-	+	-		-	+	-	-	-	-

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	OI	SU	Wa	Zu	SA	SI	KP	HP
2041. With 4 moccasins buried . .	+	+	+	-	-	M	+	+	+	+	+	+	-	M	-	S	-	-	-	-
2042. Counter sticks, 26 . .	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
2042a. Counter sticks, 40 . .	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2042b. Counter sticks, 102, 104, 106 . . . . .	+	+	-	-	-	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-
2043. 10, 4, 0 count . . . . .	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-
2044. 10, 6, 4, 0 count . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2045. 10, 6, 0 count.	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2046. 3d guess counts	-	-	+	-	-	S	S	S	S	S	S	-	-	-	-	-	-	-	-	-
2047. Blanket concealment . . .	+	+	-	-	-	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-
2048. With 4 tubes . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	+	+	+
2049. Called "old man," etc. . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+
2050. 4 tubes marked at end, middle, both ends . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
2051. Guess for 3d tube . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	+
2052. Blanket concealment .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	+
2053. Sticks for counters (150) . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
2054. Maize for counters (50-100). . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+
2055. 10, 6, 4, 0 count (losses) . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	+
2056. 10 count (losses) . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
Odd-even; Drawing straws:																				
2057. Odd-even game with pebbles, etc. (Correct guess takes stakes) . . . . .	-	-	-	-	-	-	-	-	-	+	+	-	+	-	-	-	-	-	-	-
2058. Drawing straws, boys' game (longest sought) . . . . .	-	-	-	-	-	+	-	+	-	+	+	-	-	M	-	-	-	-	-	-
Dice games:																				
2059. Wooden staves . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+
2060. Three-stave game . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	M	+	+	-	+	-	-
2061. Sex of players, male . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	-	-
2062. Sex of players, female . .	+	+	-	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-
2063. Throw staves on stone . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	-	-
2064. Circle of stones for count . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-
2065. Square of stone for count . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
2066. Charcoal marks on stone slab . . . . .	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2067. No. of spaces, 40 . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	-	-
2068. Return space ("river"). . .	?	+	?	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	-	-
2069. Safety spaces . . . . .	+	+	+	+	+	+	+	+	+	+	+	(+)	+	+	+	+	-	+	-	-
2070. "Killed" if met . . . . .	+	+	+	+	+	+	+	+	+	S	S	+	+	+	+	+	-	+	-	-
2071. No. of sides, 2 . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	-	-
2072. Keep going if overrun . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	-	-
2073. Count: all marked up . . . .	5	5	5	5	5	5	5	5	5	6	5	5	5	5	5	10	-	-	-	-
‡2074. All plain up . . . . .	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	5	-	-	-	-
2074a. 10-throw entitles to another throw . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-
‡2075. One marked up scored . . . . .	2	2	2	1	2	2	12	2	2	-1	1	2	2	2	1	3	-	-	-	-
‡2076. One plain up . . . . .	3	3	3	2	3	3	3	3	3	0	3	3	3	3	2	4	-	-	-	-
2077. Count number notches up . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
2078. 10, 6, 4 count . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
2079. Four-stave game . . . . .	-		+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	+
2080. Circle of stones . . . . .	-	-	-	-	+	?	-	-	+	-	-	-	-	-	-	-	-	-	-	-
2081. Marked buckskin or raw- hide . . . . .	-	+	+	-	?	?	+	+	-	-	-	-	-	-	-	-	-	-	-	-
2082. Square of holes . . . . .	-	-	-	-	?	?	-	-	-	-	-	-	-	-	-	-	-	-	-	+
2083. Spaces number 120 . . . . .	-	+	-	-	?	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2083a. Spaces number 41 . . . . .	-	-	-	-	?	?	-	-	-	-	-	-	-	-	-	-	-	-	-	+
2083b. Spaces number 40 . . . . .	-	-	+	+	?	?	+	+	+	-	-	-	-	-	-	-	-	-	-	-
2084. Safety spaces . . . . .	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	+
2085. Subtraction count . . . . .	-	+	-	-	?	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2086. Stick counters . . . . .	-	-	-	-	-	-	-	-	-	44	24	-	-	-	-	-	-	-	-	-
2087. Lines marked on ground as count . . . . .																				+
2088. Staves thrown on stone . . . . .	-							+	+	+	+	-	-	-	-	-	-	-	-	+
2089. Color up or down counts . . . . .	-		+	+	?	?	+	+	+	+	-	-	-	-	-	-	-	-	-	+
2090. Stave crossings count . . . . .	-	+	+	+	?	?	+	+		-	-	-	-	-	-	-	-	-	-	-
2091. Special staves up count specially . . . . .																				+
2092. "Killed" if met in counting . . . . .	-	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	+
2093. Keep going if overrun . . . . .	-	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	+
2094. Sexes playing, both . . . . .	-							+	+	+	+	-	-	-	-	-	-	-	-	+
2095. No. of sides, 2 . . . . .	-							-		+	+	-	-	-	-	-	-	-	-	+
2095a. No. of sides more than 2 . . . . .								+		-	-	-	-	-	-	-	-	-	-	+
2096. Eight-stave game . . . . .	-										+	-	-	-	-	-	-	-	-	-
2097. Scatter sidewise . . . . .	-										+	-	-	-	-	-	-	-	-	-
2098. Women play . . . . .	-										+	-	-	-	-	-	-	-	-	-
2099. Twelve-stave game . . . . .	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2100. Men play . . . . .	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2101. Throw up in basket . . . . .	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2102. Sixteen-stave game . . . . .	-				+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2103. Both sexes play . . . . .	-				+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2104. Throw up in basket . . . . .	-				+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2105. "Cubical" die (deer knee- cap) . . . . .	-				+	-	-	+	+	+	+	-	-	-	-	-	-	-	-	+
Various games:																				
2106. Guessing and jumping game (Pima vaputta) . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
2107. Child's game . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
2108. Heads-and-tails with stone (wet- dry) . . . . .	-								+	+	-	-	-	-	(+)	+	-	-	-	-
2109. Jackstones . . . . .	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	+	+
2110. Number, five . . . . .	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	+	+
2111. Stones . . . . .	-	-	-	-	-	-	S	S	S	S	S	-	-	-	-	-	-	-	+	+
2112. Walnuts . . . . .	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-
2113. Top spinning . . . . .	-	-	+	-	+	-	-	+	+	+	+	+	+	-	+	+	+	+	+	+
2114. Acorn top . . . . .	-	-	-	-	-	-	-	+	+	+	+	+	+	-	-	-	-	-	-	-
2115. Top of pitch and stick . . . . .	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2116. Wooden top . . . . .	-	-	-	+	-	-	-	S	-	-	+	+	-	-	+	+	+	-	-	-
2117. Sliding arrows . . . . .		+						+	+	+	+	+	+	-	-	-	-	-	+	+
2118. Cat's cradle . . . . .	+	+	+	+	+	+	-	-	+	+	+	+	+	M	+	M	(-)	-	-	+
2119. Played only in winter . . . . .	+	+			-	-	-	-	-	-	-	+	+		+					-
2120. Played by men . . . . .	+	+	-	-	+	-	-	-	+	+	+	-	-		+					-
2121. Played by women . . . . .	+	+	-	S	+	-	-	-	+	+	+	+	-		+					-
2122. Played by children . . . . .		+		+		+	-	-	+	-	+	+	+		+					+
2123. Juggling by young women . . . . .	-	-	-	+	+	+	+	+	+	+	+	+	+	+	-	M	-	-	-	+
2124. Small gourds . . . . .	-	-	-	-	+	-	+	+	+	+	+	-	-	-	-					-
2125. Pebbles . . . . .	-	-	-	+	-	-	-	+	+	+	-	+	-	-	-					+
2126. Walnuts . . . . .	-	-	-	-	-	+	-	+	+	+	-	-	-	-	-					-
2127. Clay balls . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-					-
2128. Quoits, in hole . . . . .	-	-	+	+	+	+	+	+	+	+	+	+	+	-	-	+	+	+	+	+

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	L1	Ol	SU	Wa	Zu	SA	SI	KP	HP
2129. Buzzer toy . . . . .	-	-	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	
2130. Puzzle with grass loops . . . . .		-									+	-	-	-	-	-	-	-	-	
2131. Archery games(see nos. 2002, 2003) . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
2132. Distance . . . . .		+												+	+	+	+	+	+	
2133. Stationary target . . . . .	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
2134. Moving target . . . . .	+	-	+	+	+	-	+	+	+	+	+	+	+	+	-	-	-	+	+	
2135. Warfare games for boys . . . . .		+	+	+	+	-	+	+	+	+	+	-	-	-	+	-	+	-	-	
2136. Wrestling . . . . .	+	+	+		+	+	+	+	+	+	+	-	+	-	+	+	+	+	+	
TOYS																				
2137. Poppun toy . . . . .	-	+	+	+	+	+	+	+	+	+	+	-	+	-	-	+	+	-	+	
2138. Pea shooter of cane (blown) (see fig. in Notes) . . . . .	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	
2139. Pea shooter with spring . . . . .																+				
2140. Dolls . . . . .	-		+	+	+	+	+	+	+	+	+	+	+	M	+	+	-	-	+	+
2141. Toy cradle . . . . .	-	+		+	+	+	+	+	+	+	+	-	-		+	+	-	-	-	
2142. Doll of plant material . . . . .	-	+	-	-	+	+	+	+	+	+	+	-	-		+	+	-	-	-	
2143. Of clay . . . . .	-	-	+	+	-	+	+	+	+	+	+	-	-		-	+	-	-	+	+
2144. Of animal skin . . . . .	-							+	+	+	+	+	+		+	(+)	-	(+)	-	
2144a. With imitation hair . . . . .	-							+	+	+	+	+	S		-	-	-	-	-	
2145. Of stone (natural pebble) . . . . .	-								+	+	+	-	-		-	S	-	-	-	
PIPES																				
2146. Tubular . . . . .	-	+	-	+	+	+	+	+	-	-	+	-	-	-	-	+	-	+	+	
2147. Stone . . . . .															-		-	+	-	
2148. Cane or elder . . . . .	-	-	-	+	+	-	-	+	-	-	+	-	-	-	-	+	-	-	-	+
2149. Wood . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
2150. Pottery (see figs. in Notes) . . . . .	+	+	+	+	+	+	+	+	+	-	-	+	+	-	+	-	-	+	-	
2151. For ceremonial . . . . .		-	+	-	-	S	S	S	S	-	-	-	-	-	-	-	-	+	-	
2152. Elder or cane stem . . . . .	-													-	-	-	-	+	-	
2153. Obtuse-angled pipe (see fig. in Notes) . . . . .	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2154. Elbow pipe . . . . .	+	-	+	-	-	-	-	-	+	+	+	+	+	+	+	-	-	-	-	
2155. Pottery bowl . . . . .				+						+	+	+	+		+					
2156. Stone bowl . . . . .	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	
2157. Shell bowl (white) . . . . .	+													-	-					
2158. Bone stem . . . . .	-	-	-	-	-	-	-	-		+	-	-	-	-	-					
2159. Cane or elder stem . . . . .	+	-	S	-	-	-	-	-		+	+	-	-	(+)	+					
2160. Pipes from ruins used . . . . .	+	+	-	S	+	S	S	S	-	+	-	-	-	-	+	-	-	+	-	
2161. Cigarette . . . . .	+	+	+	+	+	+	+	+	+	+	+	-	+	-	+	+	+	+	+	+
2162. Yucca-leaf wrapper . . . . .	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-
TOBACCO																				
2163. Wild tobacco gathered . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+
2164. Mixed with bark for smoking . . . . .	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	
2165. Mixed with other plant material . . . . .	-	-	+	+	-	+	+	+	+	+	+	-	+	-	-	+	+	-	-	
2166. Tobacco cultivated . . . . .	-	+	+	+	+	+	+	-	-	-	-	-	-	-	+	-	-	-	-	+
2167. Ashes for fertilizer . . . . .	-	-	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	
2168. Tobacco kept in mt.-sheep-skin bag . . . . .	-	-	-	+	-	-	-	-	-	-	-	-	-	-	S	-	-	+	-	

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
2169. Kept in whole fur bag . . .	-	+	+	+	-	+	+	+	-	-	-	-	+	-	+	-	+	+	-	
2170. Kept in buckskin bag . . .	+	-	-	-	+	S	-	+	+	+	+	+	+	+	-	-	+	+	+	
2171. Kept in clay pot . . . . .	-	-	-	-	-	S	S	-	S	-	-	-	-	-	S	+	+	S	+	
2172. Kept in gourd . . . . .															+	+	+	-	S	
2173. Pipe in same container as tobacco . . . . .		+					+				+	+	+	+	+	-	-	+	+	
2174. Women (old only) smoked . . . . .	-	+	+	-	-	-	-	+	+	+	+	+	+	-	+	-	-	+	+	
2175. Young men smoked . . . . .	+	-	+	+	+	-	+	+	S	-	+	+	-	-	-	+	-	-	-	
2176. After first coyote killed . . . . .	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	+	
2177. Fictitious coyote capture (saying) . . . . .		+	+	+	+	+	+	-	+	+	+	-	-	-	-	+	+	-	?	
2178. Ceremonial smoking in kiva . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	
2179. Bedtime smoking . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
2180. Also daytime smoking . . . . .	+	+	+	S	+	+	S	+	+	+	+	-	+	+	+	+	+	+	+	
MUSICAL INSTRUMENTS																				
<u>Rattles, etc.</u>																				
2181. Gourd rattle . . . . .	+	+	+	-	-	-	-	-	-	M	M	+	-	-	+	+	+	+	+	+
2182. With pebbles . . . . .	+	?	-	-	-	-	-	-	-	-	+	-	-	-	+	+	+	+	+	+
2183. With seeds . . . . .		?	+	-	-	-	-	-	-	+	-	-	-	-	S	-	-	-	-	-
2184. Nothing put in . . . . .	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
2185. Gourds bought . . . . .	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-
2186. Buffalo-horn rattle . . . . .	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-
2187. Turtle-shell rattle, deer hoofs attached, on dancer's calf . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	
2188. Turtle shell on stick, in hand . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	S	-	
2189. Hide or bladder rattle . . . . .	+	?	-	-	-	-	-	-	-	+	-	-	-	-	-	+	+	-	-	
2190. Shape ellipsoid . . . . .	+		-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	
2191. Shape gourdlike . . . . .			-	-	-	-	-	-	-	+	-	-	-	-	-	+	+	-	-	
2192. Contents pebbles or seeds . . . . .	+		-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	
2193. Painted and feathered . . . . .	+		-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	
2194. Deer-ears rattle . . . . .		?	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	
2195. Deer-hoof rattle . . . . .	+	?	-	-	-	-	-	+	+	+	+	-	-	M	+	-	-	+	-	
2196. Hoofs in bunch . . . . .	+		-	-	-	-	-	+	+	+	+	-	-	+	-	-	-	+	-	
2197. At end of handle . . . . .			-	-	-	-	-	+	+	+	-	-	-	+	-	-	-	+	-	
2198. Buffalo-hoof rattle, loop hide handle . . . . .			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	
2199. Notched rasp, ceremonially used . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	
2200. Coiled basket scraped with stick . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	+
<u>Drums</u>																				
2201. Basket as drum . . . . .	+	+	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	+
2202. Pottery drum with skin head . . . . .	+	+	+	+	+	+	+	+	+	+	-	-	-	M	+	+	-	+	-	
2203. Ring drumstick . . . . .	+	+	+	+	+	+	+	+	+	+	-	-	-	-	+	+	-	-	-	
2204. Wooden bowl with skin head . . . . .											+	-	-	-	-	-	-	-	-	
2205. Tambourine-type drum, strings across bottom . . . . .	-	-	-	-	-	-	-	-	-	+	+	+	+	M	-	-	+	+	-	
2206. Straight drumstick . . . . .	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	+	+	-	
2207. Hollow-log drum, 2 skin heads . . . . .	-	-	-	-	-	-	-	-	-	-	-	+	+	M	M	+	+	+	-	
2208. Bull-roarer . . . . .	+	+	+	+	+	+	+	-	+	-	-	+	-	+	+	+	-	+	+	
2209. Small stick on cord for grip . . . . .	-	-	-	-	-	-	-	-	+	-	-	+	-	-	+	+	-	+	+	
2210. Of lightning-struck wood . . . . .	+	+	+	?	-	-	-	-	-	-	-	-	-	S	+	-	-	-	-	
2211. Design on . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	+	-	
2212. Used in public, visibly . . . . .	-	+	+	+	+	+	+	-	-	-	+	-	-	+	+	-	-	+	-	

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
2213. Out of sight . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-
2214. During dance . . . . .	-	-	-	+	+	+	+	-	-	-	-	-	-	-	+	+	-	-	-	-
2215. For curing . . . . .	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S
2216. To bring wind . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	+
2217. To stop snow . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
2218. As toy only . . . . .	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-
2219. Musical Bow . . . . .	-	+	+	+	-	+	-	+	+	+	+	-	-	+	-	-	-	M	+	+
2220. Hunting bow used . . . . .	-	+	+	+	-	+	-	+	+	+	+	-	-	+	-	-	-	-	-	+
2221. Against teeth . . . . .	-	+	-	+	-	+	-	+	+	+	+	-	-	-	-	-	-	+	-	-
2222. On inverted basket . . . . .	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
<u>Whistle, Flute, Flageolet</u>																				
2223. Bone whistle (single) . . . . .	-	-	-	-	-	-	-	-	-	+	+	-	-	+	-	-	-	+	-	-
2224. For war . . . . .	-	-	-	-	-	-	-	-	-	+	+	-	-	?	-	-	-	?	-	-
2225. Bone tube blown over . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
2226. Cane whistle . . . . .	-	+	-	-	-	-	-	-	-	+	-	-	-	-	+	+	+	-	-	-
2227. Flute, end blown . . . . .	+	+	-	-	-	-	-	-	+	+	-	+	+	-	+	+	+	+	+	+
2228. Cane . . . . .	+	+	-	-	-	-	-	-	+	+	-	+	+	-	?	+	+	+	+	+
2229. Number of holes (stops) .	4	4	-	-	-	-	-	-	2	4	-	4	4	-	3	3	6	6	3	3
2230. Convenience only in spacing . . . . .	+	+	-	-	-	-	-	-	+	+	-	+	+	-	+	+	+	+	+	+
2231. For amusement only . . . . .	+	-	-	-	-	-	-	-	+	+	-	+	+	-	-	-	+	+	+	+
2232. Males only used . . . . .	+	-	-	-	-	-	-	-	-	-	-	+	+	-	+	+	+	+	+	+
2233. At dances . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-
2234. Decorated . . . . .	-	-	-	-	-	-	-	-	+	S	-	+	+	-	-	-	+	S	-	-
2235. Flageolet . . . . .	-	-	+	+	+	+	+	+	-	-	+	+	+	-	-	-	-	-	-	-
2236. Reed of wood, gum or pitch, pith . . . . .	-	-	+	+	-	+	+	-	-	-	-	+	+	-	-	-	-	-	-	-
2237. Reed of cane diaphragm .	-	-	+	+	+	+	+	+	-	-	+	?	?	-	-	-	-	-	-	-
2238. Reed of buckskin, ex- ternal . . . . .	-	-	+	+	+	+	+	+	-	-	+	-	-	-	-	-	-	-	-	-
2239. Number of holes (stops) (3-4) . . . . .	-	-	+	+	+	+	+	+	-	-	+	-	-	-	-	-	-	-	-	-
2239a. Number of holes (stops) (6) . . . . .	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-
2240. Convenience only in spacing . . . . .	-	-	+	+	+	+	+	+	-	-	+	+	+	-	-	-	-	-	-	-
2241. Even distances . . . . .	-	-	+	+	+	+	+	+	+	-	-	+	+	+	-	-	-	-	-	-
2242. For amusement or court- ship . . . . .	-	-	+	+	+	+	+	+	-	-	+	+	+	-	-	-	-	-	-	-
2243. Pyrographic decoration . . . . .	-	-	+	+	+	+	+	?	-	-	-	+	+	-	-	-	-	-	-	-
CALENDAR																				
2244. 4 seasonal names only . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-
2245. Descriptive-type calendar . . . . .	+	+	+	+	+	+	+	-	-	+	+	-	-	+	+	+	+	+	+	+
2246. 6 months repeated . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
2247. Ceremonial-type calendar . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
2248. Day tally kept . . . . .	+	+	-	-	-	-	-	-	S	+	-	-	-	-	-	+	-	-	-	-
2249. Month tally . . . . .	+	+	-	-	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-
2250. Notched calendar stick (year count) . . . . .	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	+
ROCK PICTURES																				
2251. Pictographs made . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
2252. Petroglyphs made . . . . .	-	-	-	-	-	-	+	-	-	-	-	-	-	+	(+)	+	-	-	+	+
COUNTING																				
2254. Counting on fingers . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
2255. Begins with left little finger . . . . .	+	+	+	+	-	+	+	S	S	+	+	+	+	+	+	+	+	+	+	S
2256. Ends with right little finger . . . . .	-	+	+	+	+	+	+	S	S	+	+	+	+	+	+	+	-	S	S	+

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
2257. Ends with right thumb . . . . .	+	-	-	-	-	-	-	S	S	-	-	-	-	-	-	-	+	S	S	
2258. Ends with left thumb . . . . .		-	-	+	+	-	-	S	S	-	-	-	-	-	-	-	-	-	S	
2259. With sticks . . . . .	+	+	+	-	+	-	+	+	+	+	-	-	-	-	+	+	+	+	-	
2260. With stones . . . . .	+	+	-	-	-	-	-	+	-	+	-	-	-	-	+	+	-	+	+	
2261. With maize kernels . . . . .		+													+	+	-	+	+	
MESSAGE MNEMONICS																				
2262. Red cloth on war messenger's hair . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	
2263. Knotted string . . . . .	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	
2264. Tobacco in pipe or cane . . . . .	-	-	+	+	+	+	+	-	-	+	-	-	-	-	-	-	-	-	-	
ASTRONOMY, ETC.																				
2265. Named moon phases . . . . .	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	-	-	+	+	
Constellations and single stars:																				
2266. Mt.-sheep or deer, Orion's Belt . . . . .			+		+	-		-	-	+	+	-	-	+	-	-	-	-	-	
2266a. Woman with children, Pleiades . . . . .			-		-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	
2267. Saguaro-fruit gathering crook, Ursa Major . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
2268. "Pivoting," Ursa Minor . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	
2269. Not moving, Polaris . . . . .		-	+		+	?	+	+	+	+	+		+	-	-	?	-	?	-	
2270. Dust (ashes) road, Milky Way . . . . .		+	+		+	-	-	-	-	-	-	?	?		-	-	-	-	-	
2271. Sky's back or backbone, Milky Way . . . . .		-	-		-	-	-	-	-	-	-	?	?		-	-	-	+	-	
2272. Scattering salt, Milky Way . . . . .		-	-		-	-	-				+	?	?		-	-	-	-	-	
2273. Hand, fingers . . . . .		-	+		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2274. Falling star, a star feather . . . . .						-	+	-	-	-	-	?	-	-	-	-	-	?	-	
2275. Star excrement . . . . .		-					-							+	-	-	-	?	-	
2276. Eclipse is death of sun . . . . .	+	+	+	+	+	-		-	-	-	-	-	-	-	+	+	?	+	+	
2277. Burn dog manure as aid . . . . .															-	+		-	-	
2278. Work taboo . . . . .		+			?	-		-	-						-	+	?	+	-	
2279. Pots broken, lest become monsters . . . . .															-	+		-	-	
2280. Singing, shouting, wailing . . . . .	-	+	+	+	-	-	+	-	-	-	-	-	-	-						
2281. Must not eat during eclipse . . . . .	+	+	+	+	-	-		-	-	-	-	-	-	-	+			+	-	
2282. Pray for sun . . . . .		+	+			-	+	-	-	-	-	-	-	-	(-)	+		+	-	
2283. Eclipse omen of many deaths . . . . .		+	+	+	+	-	?	-	-	-	-	-	-	-	-	-		+	-	
2284. Moon-eclipse observances . . . . .	+	+	+	+	+	-	+	-	-	-	-	-	-	-	(+)	+		+	-	
2285. Must not sleep during eclipse . . . . .	+	+	+	+	+	-		-	-	-	-	-	-	-	-	-		-	+	
2286. Pray for moon . . . . .		+				-	+	-	-	-	-	-	-	-	-	-		-	+	
2287. Rainbow: bad to point at with finger . . . . .	+	+	+		-	-	-	-	-	-	+	-	-	+	+	+	-	+	-	
2288. All right to point with thumb . . . . .	+	?	+		+			+	+	+	+	+	+	-	-	-		-	+	

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	OI	SU	Wa	Zu	SA	SI	KP	HP
2289. Pray to rainbow . . . . .	+					+		+	-	S	-	-	-	-	-	-	-	-	-	-
2290. Pointing at stars causes warts .	-									+	-	-	+	-	-	-	-	-	-	-
2291. All right to point with thumb . . . . .	+									+	+	+	+	+	-	+	+	+	+	+
2292. Anthropomorphic beings make thunder and lightning . . . . .	?	+	?		+	?	-	+	+	+	+	?	?	?		+		?	+	
2293. Bird makes . . . . .	?					?		-	-	-	+	?	-	?		-		?	-	
2294. Lightning made by cloud people .	?	+	?		+	?	+	?	+	+	-	?	?	?				?	?	
2294a. Flint points are thunderbolts . .	+	+								+					+					+
2295. Male rain, with thunder . . . . .	+	+	+		+	+	+	+	+	-	-	-	-	-		+				-
2296. Female rain, without thunder . . .	+	+	+		+	+	+	+	+	-	-	-	-	-		+				-
2297. Sun male . . . . .	?	+	+	+	+	?	+	+	+	-	+	?	-	+	+	+	+	+	+	+
2298. Moon male . . . . .	?	+	-	-	-	?	-	-	-	-	+	?	-	+	+	-	-	+	?	
2299. Moon female . . . . .	?	-	+	+	+	?	+	+	+	-	-	?	-	-	-	+	+	-	?	
2300. Sky male . . . . .	+	+	+		+	+	+	+	+	-	?	-	-	-	+	+	?	+	+	
2301. Sky female . . . . .	-	-	-		-	-	-	-	-	-	?	-	-	+	-	-	?	-	-	
2302. Earth female . . . . .	+	+	+		+	+	+	+	+		?	-	-	-	+	+	+	+	+	
2303. Earth male . . . . .	-	-	-		-	-	-	-	-	-	?	-	-	+	-	-	-	-	-	
2304. Earthquake: female in west, dig- ging . . . . .	-	-													-					+
2305. Earth stretching her- self . . . . .	+	-													-	-	?	-	-	
2306. Water snake moving . . . . .	-	-													+					
2307. Man kicking earth . . . . .	-	+		+	?			?	?	-	?	?	?	?	-	-	?	-	-	
New moon observances and beliefs:																				
2308. New moon as resurrection symbol . . . . .	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2309. Children shout . . . . .	-	-	+	+	+	+	+	-	-	-	-	+	-	-	+	-	-	-	-	-
2310. Children run . . . . .	-	-	+	+	+	+	+	-	-	-	-	-	-	-	+	-	-	-	-	-
2311. Adults run and shout . . . . .	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2312. Pray for health, long life (by adults) . . . . .	-	-	+	+	+	+	+	-	-	-	-	-	+	+	-	+	-	+	-	-
2313. Baby held up . . . . .	-	-				+	+	+	+	+	+	-	-	+	-	-	-	-	-	-
2314. Adults rub faces . . . . .	-	-	+	-	+	-	-	-	-	-	-	+	-	+	-	+	-	-	-	-
2315. Horizontal means drought . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+
2316. Vertical means rain . . . . .	?	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+
2317. Prayer to sun at rising . . . . .	+	+			+	+	+	+	+	+	+	+	-	+	+			+	-	
2318. Pollen in fingers . . . . .	+	+			+	S	+	S	+	-	+	+	-	+				+	-	
2319. Corn meal thrown . . . . .															+			+	-	
2320. Prayer to earth . . . . .	+											+	+	+	+			+	-	
2321. Pollen used . . . . .	+											-	-	+	-			+	-	
2322. Corn meal on ground . . . . .															+			+	-	
2323. Sign language . . . . .	-							-	-	(+)	+	-	(+)	-	-	-	-	-	-	-
LIFE CRISES																				
<u>Childbirth</u>																				
2324. Pregnancy regulations: woman walks E before sunrise . . . . .	-	-	S	+	+	S	+	S	S	S	S	-	-	-	+	-	?	-	-	-
2325. Prays to sun for easy birth . . . . .	-	+	-	+	+	+		-	-	-	-	-	-	-	+	+	?	?	-	-
2326. Taboos: food burned or stuck in pot . . . . .	+				+	+	-	-	-	-	-	+	+	-	-	+	-	?	-	+
2327. Food of 2 parts stuck to- gether not eaten, lest twins . . . . .	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	+	?	?	-	+
2328. Internal organs not eaten . . . . .	-	?	+	+	-	+	+	+	+	-	-	-	-	+	-	-	-	-	-	+



	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
2363. Put in cave after 2 or 3 years . . . . .	-	-												+	-	-	-	-	-	-
2364. Placenta buried . . . . .	+	+	-	-	S	-	-	S	-	?	-	+	+	+	-	+	-	+	-	-
2365. Put in river . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
2366. Put in tree or bush . . . . .	-	-	+	+	S	+	+	+	+	?	+	-	-	-	-	-	-	-	-	+
2367. Put under rock . . . . .	-	-	-	-	S	-	-	S	-	?	-	-	-	-	+	-	-	-	-	-
2368. Childbirth drink (hot) . . . . .	+	+	+	+	+	+	+	+	+	+	+	-	-	+	+	+	+	+	+	-
2369. Deer soup . . . . .	-	-	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	+	-	-
2370. Twins welcomed . . . . .	-	+	?	-	+	-	-	-	-	-	?	-	-	?	-	-	-	-	-	-
2371. One killed . . . . .	-	-	?	-	-	+	+	-	+	+	?	-	-	?	-	-	-	-	-	-
2372. Not liked . . . . .	-	-	?	+	-	+	+	-	+	+	?	-	-	?	-	-	-	-	-	-
2373. Indifference . . . . .	+	-	?	-	-	-	-	+	?	-	?	+	+	?	-	-	-	-	-	-
2374. "Steaming," etc., of breasts, etc., to start milk flow . . . . .	?	-	-	-	+	-	-	+	?	+	-	-	-	+	-	+	-	?	-	-
2375. Baby first washed by paternal grandmother . . . . .		?	-	-	-	S	S	S	S	S	?		S	?	+	+	-	?	-	-
2376. Baby washed by cord cutter . . . . .		+									+	+		?	-	-	-	-	+	-
2377. Baby first washed by other woman . . . . .		-	+	+	+	+	+	+	+	+	-	+	+	+	-	-	+	-	-	+
2378. Stillborn buried . . . . .	+	-	+	+	+	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+
2379. Stillborn deposited in branches of tree . . . . .	-	+	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-
<u>Other infancy practices:</u>																				
2380. "Baking" of mother and baby on coals, leaves, bark, mud . . . . .		+	+		-	-	-	-	S	-	-	-	-	+	-	+	-	-	-	-
2381. Warmed stone on new mother's abdomen . . . . .															+		+			-
2382. Suckling begins 1st day . . . . .	-	-	-	-	+	+	+	-	-	-	-	-	-	-	+	+	-	-	-	+
2383. Begins 2d day . . . . .	+	-	+	-	+	-	-	+	+	+	+	+	+	-	-	-	-	-	-	-
2384. Begins 3d day . . . . .	+	-	-	+	+	-	-	+	-	-	-	-	+	+	-	-	-	-	-	-
2385. Begins 4th day . . . . .	-	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-
2386. Baby drinks before mother suckles . . . . .	+	+	-	-	+	S	-	-	+	-	-	-	+	+	+	-	+	+	-	-
2387. Maize pollen (dry) on baby's tongue . . . . .		+													-	-	+	-	-	-
2388. Held baby up to cardinal directions . . . . .		-								+	+	-	-	-	-	+	(+)	+	-	-
2389. Infanticide admitted . . . . .	-	-	-	-	-	+	+	-	+	+	-	-	-	-	-	-	-	-	-	+
2390. One twin of pair . . . . .	-	-	-	-	-	+	+	-	+	+	-	-	-	-	-	-	-	-	-	-
2391. Strangled . . . . .	-	-	-	-	-	?	?	-	?	+	-	-	-	-	-	-	-	-	-	+
2392. Taboos for new mother: no cold water to drink . . . . .	+	+	+	+	+	+	+	-	-	-	-	+	+	+	+	+	+	+	+	+
2393. No salt . . . . .	-	-	+	+	+	-	-	-	-	-	-	+	-	-	+	-	-	-	-	+
2394. No meat . . . . .	-	+	+	+	+	-	-	-	-	-	-	+	?	+	+	-	-	-	-	+
2395. No fat . . . . .	-	+	-	+	+	-	+	-	-	-	-	-	?	+	+	-	-	-	-	+
2396. New father also . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
2397. Scratching-stick . . . . .	-	-	+	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-
2398. New father also . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
2399. Father inactive . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
<u>Naming</u>																				
2400. At birth . . . . .	+	+	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
2401. Days after birth (4-20) . . . . .																				
2402. Before weaning . . . . .	+	+	+	-	+	-	+	-	+	+	+	+	+	+	+	-	+	+	+	+
2403. After weaning . . . . .	+	-	-	+	-	+	-	+	-	-	+	-	-	-	-	-	+	-	-	-
2404. Nickname type . . . . .			-	+	+	S	+	+	+	+	?	?	+	(+)	-	-	?	?	-	-
2405. From a dead relative . . . . .	-	S	+	S	-	S	-	-	-	-	-	-	-	-	+	S	+	-	-	-
2406. From a living relative . . . . .	-	S	-	-	-	-	-	-	-	-	-	-	-	-	+	S	S	S	-	-
2407. On paternal side . . . . .	-	?	-	-	-	-	-	-	-	-	-	-	-	-	+	+	?	+	-	-
2408. On maternal side . . . . .	-	?	+	+	-	+	-	-	-	-	-	-	-	-	-	+	?	+	-	-
2409. Names relate to war . . . . .	+	+	S	+	?	?	?	S	+	-	?	?	?	-	?	-	-	-	-	-
2410. Names relate to sex . . . . .	+	?	S	?	?	?	?	?	-	-	?	?	?	?	?	-	+	-	-	-
2411. Names relate to name-giver's clan . . . . .	-	(+)	?	-	-	?	-	-	-	-	-	-	-	-	?	-	S	-	-	-
2412. Name belongs "to child's clan" . . . . .	-	-	+	+	-	S	-	-	-	-	-	-	-	-	-	-	S	-	-	-
2413. Teknonymy . . . . .	+	+	-	-	-	S	-	-	-	-	-	?	-	-	-	+	+	S	-	-
<u>Education; Puberty; Menstruation</u>																				
<u>Children's education:</u>																				
2414. Boys instructed chiefly by father . . . . .	+	S	+	+	+	+	+	-	+	+	S	S	S	S	+	+	+	+	+	+
2415. By maternal grandfather . . . . .			+					+	S	S	+	+	+	+		+				+
2416. By paternal grandfather . . . . .			+					+	S	S	+	+	+	+	+	+				+
2417. Girls instructed chiefly by mother . . . . .	+	S	+	+	+	+	+	-	+		S	S	S	+	+	+	+	+	+	+
2418. By maternal grandmother . . . . .			+					+	S	+	+	+	+		+	+	+			+
2419. By paternal grandmother . . . . .			+					+	S	+	+	+	+		+	+				+
2420. Children bathed in snow or ice to harden . . . . .	+	+	-	+	+	+	+	+	+	+	+	-	-	+	+	+	+	+	+	-
2421. Owl as "bugaboo" . . . . .			+					+	+	-	-	-	-	+	+	+	+	+	+	+
2422. Wound cross is "bugaboo owl" . . . . .	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2423. 1st tooth to E . . . . .			+					+	+	+	+	-	-	-	+	+	+	+	+	-
2424. 1st tooth to W at any time . . . . .			-					-	-	-	-	-	-	-	-	-	-	-	-	+
<u>Boys' puberty observances:</u>																				
2425. Play with sisters taboo . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-
2426. Trained in tribal legends . . . . .	+	+	+	-	+	-	-	+	+	+	-	-	-	+	+	-	+	+	+	+
2427. Number of days . . . . .			?	-	2	-	-	?	4	4	-	-	-	?	?	-	?	?	?	?
2428. New name . . . . .	+	S	-	(+)	+	S	+	-	S	S	-	-	-	-	+	-	-	-	-	-
2429. Runs up hill . . . . .			-						+	+	+	-	S	S	+	-	+	+	(+)	
2430. Whipped with twig by father . . . . .	-	-	+	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-
2431. Runs E at sunrise . . . . .			+	+	+	+	-	?	-	+	-	-	S	S	+	(+)	+	+	(+)	
2432. Old man with whip conducts . . . . .			-							+	+	-	-	-	-	-	-	-	-	-
<u>Girls' puberty observances:</u>																				
2432a. Special term for 1st menses . . . . .	-	+	-	-	-	-	-	(+)	(+)	-	-	-	-	-	-	-	-	-	-	+
2433. Girl in dwelling . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
2434. Girl in special hut . . . . .			-											+	-	-	-	-	-	-
2435. Girl secluded . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-



	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
2479. By shaman . . . . .	+	+	-	+	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-
2480. By men . . . . .	+	+	-	+	+	-	+	+	+	+	+	-	-	-	-	-	-	-	-	+
2481. By women . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
2482. People pray with pollen :	-	-	-	+	+	+	-	+	+	+	+	-	-	-	-	-	-	-	-	-
2483. Girl runs at sunrise . . .	+	+	+	+	+	S	+	+	+	+	+	-	-	-	-	-	-	-	-	-
2484. Direction (N,S,E, W); + = all 4 .	E	E	W	E	+	(E)	+	E	E	E	E	-	-	-	-	-	-	-	-	-
2485. Deer-hoof rattle by singer . . . . .	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-
<u>Regular-menstruation taboos:</u>																				
2486. Cold water . . . . .	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	?	-	-
2487. Meat . . . . .	-	-	+	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+
2488. Fat . . . . .	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+
2489. Salt . . . . .	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
2490. Scratching . . . . .	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-
2491. Riding on equine . . . . .	+	-	-	-	-	-	-	+	+	-	+	-	+	-	+	-	+	-	+	-
2492. Basketry work . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-
2493. Pottery . . . . .	-	-	-	+	-	-	?	-	-	-	-	-	+	+	-	-	-	+	-	-
2494. Cooking . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+
2495. Seclusion in menstrual hut . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
2496. 4 days . . . . .	-	-	+	+	-	-	-	-	-	-	-	-	(+)	-	-	-	-	-	-	+
2497. Woman bathes at end . . . . .	-	-	+	+	+	+	+	+	+	-	+	-	-	+	+	+	+	+	+	+
<u>Berdaches</u>																				
2498. Berdaches admitted . . . . .	+	+	-	+	-	-	-	-	-	-	+	-	-	+	-	+	+	-	+	+
2499. Males as females . . . . .	+	+	-	+	-	-	-	-	-	-	+	-	-	+	-	+	+	-	+	+
2500. Females as males . . . . .	+	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+
<u>Marriage</u>																				
2501. Monogamy . . . . .	+	+	S	S	S	S	S	+	+	+	+	+	+	+	+	+	+	+	+	+
2502. Polygyny optional . . . . .	+	+	+	+	+	+	+	+	+	M	-	-	-	M	-	-	-	-	-	+
2503. Uncommon . . . . .	-	+	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-
2504. Wives in one house . . . . .	+	-	+	+	-	S	-	-	S	-	-	-	-	-	-	-	-	-	-	+
2505. Wives in separate houses.	S	+	-	S	+	S	+	+	S	-	-	-	-	-	-	-	-	-	-	-
2506. Wives are "sisters" (sororate) . . . . .	S	+	+	+	+	+	+	S	S	-	-	-	-	-	-	-	-	-	-	+
2507. Child betrothal, before puberty .	+	+	+	+	-	(S)	-	S	S	-	-	-	-	-	-	-	-	-	-	-
2508. Couple make own choice . . . . .	+	+	+	+	+	+	S	+	+	+	+	+	+	+	+	+	+	+	+	-
2509. Subject to parents' approval . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+
2510. Marriage observances: gifts to bride's parents first . . . . .	+	+	+	+	+	+	+	+	+	+	+	-	+	-	-	-	-	-	-	-
2511. Reciprocal gifts to groom's parents . . . . .	-	+	+	+	-	+	+	+	+	-	+	-	-	-	-	-	-	-	-	-
2512. Gifts to groom's parents first . . . . .	-	-	S	S	-	S	S	S	S	-	S	-	-	-	-	-	-	-	-	+
2513. Bridegroom makes gifts throughout life . . . . .	-	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	+
2514. Bridegroom and male relatives make trousseau . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	-	-
2515. Belt of white cotton . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
2516. Two robes of white cotton . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
2517. Bridegroom's mother pre- sents clothes to bride	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
2518. Symbolic acts at marriage.	+	+	+	-	-	-	-	-	-	-	+	-	-	+	+	+	+	?	-	
2519. Handwashing by each . . . . .	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2520. Washing with yucca suds . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-
2521. Prayer and feast .	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
2522. Bridegroom presents manta to bride . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-
2523. Comb one another's hair . . . . .	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2524. Ringed cross of maize pollen . .	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2525. Eating together .	+	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
2526. Sit together . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
2527. Bride carries presents to mother-in-law .	+	S	+	+	+	+	-	-	-	-	+	-	+	+	+	+	+	?	+	+
2528. Food, once only . .	+	-	+	-	-	+	-	-	-	-	-	-	+	+	-	+	+	-	-	-
2529. For life . .	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+
2530. Sororate (post-mortem) . . . . .	+	+	+	+	-	+	+	+	+	S	+	-	-	-	-	-	-	+	+	+
2531. Parents-in-law select new bride for widower .	?	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	+
2532. Levirate . . . . .	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	S
2533. Compulsory . . . . .	-	-	+	+	+	+	+	+	+	S	-	-	-	-	-	-	-	-	-	-
2534. Nose cut off for breach . .	-	-	-	-	+	+	+	+	+	S	-	-	-	-	-	-	-	-	-	-
2535. Marriage to mother and daughter .	+	+	-	-	-	-	S	-	+	-	-	-	-	-	-	-	-	-	-	S
2536. Cross-cousin marriage, both forms . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-	+	-	-
2537. Parallel-cousin marriage . . . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
2538. Man marries wife's brother's daughter (polygyny) . . . . .	-	+	S	-	-	S	S	S	-	-	-	-	-	-	-	-	-	-	-	?
2539. Mother's brother's widow . . . . .	S	+	-	+	-	S	+	S	+	S	S	-	-	-	-	-	-	-	+	?
2540. Postnuptial residence: patrilocal . . . . .	-	-	-	+	-	-	-	-	S	S	-	-	-	+	+	-	+	-	-	+
2541. Matrilocal . . . . .	-	+	+	-	+	+	+	-	+	S	+	+	+	-	-	+	+	+	-	-
2542. Both . . . . .	+	-	-	-	-	-	-	+	S	S	-	-	-	-	-	-	-	-	-	-
2543. Final residence: patrilocal . . . . .	-	S	-	S	S	-	S	S	S	S	S	-	S	-	-	-	-	+	S	+
2544. Matrilocal . . . . .	-	S	+	+	S	+	S	S	S	S	S	-	S	-	+	+	+	+	S	-
2545. Both . . . . .	-	-	-	S	S	-	S	S	+	S	S	+	S	-	-	-	+	S	-	-
2546. Neither . . . . .	+	+	-	S	S	-	S	S	S	S	S	-	S	+	-	-	S	+	-	-
2547. Wherever like . . . . .	S	+	-	S	+	-	+	+	+	+	+	-	+	S	-	-	S	+	-	-
2548. Parent-in-law avoidance: mother son-in-law . . . . .	+	+	+	+	+	+	+	+	+	+	-	+	+	-	-	-	-	-	-	-
2549. Father son-in-law . . . . .	+	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-
2550. Father daughter-in-law . . . . .	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-
2551. Head covered . . . . .	+	-	+	+	-	-	-	S	S	S	-	-	-	-	-	-	-	-	-	-
2552. Avoidance on trail . . . . .	+	+	-	-	+	+	+	+	+	+	-	+	+	-	-	-	-	-	-	-
2553. Food handing taboo . . . . .	+	+	+	-	+	+	+	+	+	+	-	+	+	-	-	-	-	-	-	-
2554. Call him from distance to get food . . . . .	-	-	-	+	+	-	-	+	+	+	-	+	-	-	-	-	-	-	-	-
2555. Speech taboo . . . . .	+	+	+	+	+	+	+	+	+	+	-	+	+	-	-	-	-	-	-	-
2556. Address if hidden from view . . . . .	-	S	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
2557. Address in 3d person . . . . .	-	-	-	+	+	+	-	+	+	+	-	-	-	-	-	-	-	-	-	-
2558. Polite speech to sibling-in-law . . . . .	+	+	+	+	+	+	-	+	+	+	-	+	+	+	+	+	+	+	+	+
2559. Sibling-in-law joking allowed . . . . .	+	+	-	+	-	S	+	+	+	+	+	+	+	+	-	+	+	+	+	-







	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
‡2679. Household utensils . . . . .	♀	♀	♀	♀	♀	♀	♀	+	+	+	+	♀	♀	♀	♀	♀	♀	♀	♀	♀
‡2680. Woven cloth . . . . .	♀	+	-	-	-	-	-	-	-	-	-	-	-	-	+	♀	+	+	+	+
‡2681. Skin bedding, etc. . . . .	♀	♀	+	+	+	♀	+	+	+	+	♀	♀	♀	+	♂	♀	+	+	+	♂
‡2682. House . . . . .	♀	?				♀	♀	+	+	+	♀	♀	♀	+	♀	♀	+	+	+	♂
2683. Undestroyed property inherited . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-
2685. Widow inherits . . . . .	.	-				+	+	+	+	+	S	S	S	+	-	+	+	+	+	-
2686. Divided equally among children . . . . .	+	-	+	+	+	+	S	-	-	-	-	+	+	-	-	+	+	-	-	-
2687. Horses only inherited . . . . .		-										+	+	-	-	-	-	-	-	M
2688. Siblings of deceased inherit . . . . .		+													S	+	+	-	-	S
2689. Matrilineal inheritance . . . . .															+					-
WAR																				
2690. Feuds: vendetta . . . . .	+	+	+	+	+	+	+	+	+	S	-	+	?		+	-	-	-	-	+
2691. Poaching . . . . .	+	+	-	-	-	-	-	+	S	+	-	+	+		-	-	-	-	-	-
2692. Witchcraft (poisoning) . . . . .	?	+	-	+	?	?	-	-	-	S	?	-	?		?	-	-	-	-	-
2693. Family or lineage fights . . . . .	+	+	+	+	+	+	S	+	S	S	-	-	-		-	-	-	-	-	+
2694. Clan fights . . . . .		S				+		-	-	-	-	-	-		+	-	-	-	-	-
2695. Compounding murder . . . . .	+	+	+	+	+	+	S	+	+	-	-	-	-		-	+	+	+	+	-
2696. Clan and relatives pay . . . . .	+	+		+	+	+	+	+	+	-	-	-	-		-	(-)	-	-	-	-
<u>War by Whole Communities</u>																				
2697. Preparations: council . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+	+
2698. Dance of incitement . . . . .	?	-	+	+	+	+	+	+	+	+	+	-	-		-	-	-	+	-	-
2699. Sham battle . . . . .		-	+	+	+	+	+	-	-	-	-	-	-		-	-	-	-	-	-
2700. "Counting coup" . . . . .		-									+	+	-		-	-	-	-	-	-
2701. Paints . . . . .	?	+	+	+	+	-	+	-	-	-	+	+	-		+	+	+	+	+	+
2702. Face only painted . . . . .		-	+	+	+	-	+	-	-	+	+	+	-		+	+	+	+	+	+
2703. Continenence . . . . .	?	-	-	-	-	-	-	-	-	-	-	-	-		-	+	-	+	-	-
2704. Dreaming ominous . . . . .	?	+	+	?	?	+	+	+	+	S	S	-	-		+	-	+	-	-	-
2705. Warpath: warriors with different arms . . . . .	-	-	-	-	-	-	-	+	+	+	+	+	-		-	+	-	-	-	+
2706. War leader distinguished by . . . . .	?	+	+	+	+	+	+	S	S	+	+	-	-		-	-	-	S	+	+
2707. War bonnet for bravest . . . . .		-									+	+	-		(M)	-	-	-	-	-
2708. Head scratcher for novice . . . . .	?	-	+	+	+	-	+	-	+	+	-	+	-		-	-	-	-	-	-
2709. Drinking tube for novice . . . . .		-	+	+	+	-	+	+	+	+	+	+	-		-	-	-	-	-	-
2710. Novice's war cap . . . . .		-									+	+	-		-	-	-	-	-	-
2711. War cap worn by others (nos. 1202, 1382) . . . . .		S	+	+	+	+	S	S	S	-	-	S	S		-	+	-	+	+	+
2712. Clothes discarded before battle . . . . .		+								+	-	S	+		-	-	-	S	-	-
2713. Shaman accompanies . . . . .	+	+	+	+	+	+	+	+	+	S	+	-	S		-	+	-	-	-	+
2714. Women accompany . . . . .	+	-	-	-	-	-	-	S	S	-	-	-	-		-	-	-	-	-	-
2714a. Scouts . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+	+
2715. Owl or other calls . . . . .	+	-	+	-	-	+	-	-	-	-	+	-	+		-	-	+	-	-	-

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP	
2716. Wave "buckskin" . . . . .		+			+	+	+	+	+	+	+	-	-		-	-	+	+	-		
2717. Smoke signals . . . . .	+	-	-	+	-	-	-	+	+	+	+	-	-		-	-	+	-	-		
2718. Omens . . . . .	?	-	+	+	+	+	+	+	-	+	+	-	-		-	+	+	+	+		
2719. Natural . . . . .		+	+	+	+	+	+	-	-	-	+	-	-		-	+	-	+	(-)		
2720. Induced . . . . .		-	?	+	+	-	-	+	-	-	-	-	-		-	+	-	?	+		
2721. Surprise attacks . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+		
2722. War priests . . . . .		-	-	-	-	-	-	-	-	-	-	-	-		-	+	(+)	+	-		
2723. Prisoners taken . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	-	+	+		
2724. Men . . . . .		-	-	-	-	-	-	-	-	-	-	S	S		-	S	-	-	-		
2725. Women . . . . .	+	-	+	-	-	-	-	+	-	S	S	S	S		-	+	-	+	-		
2726. Children . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	-	+	+		
2728. Become members captor's clan . . . . .		+					+	+	-	-	-	-	-		-	+	-	+	-		
2729. Enslaved . . . . .	+	+	-	-	-	-	-	-	-	S	-	-	-		(+)	S	-	-	-		
2730. Adopted . . . . .		+	+	+	+	+	+	+	+	+	+	+	+		-	+	-	+	-		
2731. Women married . . . . .		S	+	+	+	-	-	+	-	+	+	+	+		-	+	-	+	-		
2732. Children mar- ried later . . . . .		+	+	+	+	+	+	+	+	+	+	+	+		-	+	-	+	-		
2733. Trophies: hair, made into effi- gies . . . . .																				+	+
2734. Scalps . . . . .	+	-	+	+	-	-	+	+	M	S	+	+	+		+	+	+	+	S	S	
2735. Small . . . . .	?	-	-	-	-	-	-	S	-	+	+	+	+		+	-	+	+	-	-	
2736. Whole skin . . . . .	?	-	+	+	-	-	+	+	+	+	-	-	-		-	+	+	+	+	+	
2737. Fear of scalp . . . . .		-	-	-	-	-	-	-	-	(+)	-	-	-		+	+	(+)	+	+		
2738. Special custodian . . . . .		-	-	-	-	-	-	-	-	-	-	-	-		+	(+)	+	+	-	+	
2739. Special preservation . . . . .		-	-	-	-	-	-	-	-	+	+	+	+		+	+	+	+	-	+	
2740. Thrown in fire at end of dance . . . . .		-	+	+	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	
2741. Thrown in bushes . . . . .								+	+	+	+	+	+		-	-	-	-	-	+	
2742. Victory dance . . . . .	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+		
2743. At home . . . . .		+	+		+	+	+	+	+	+	+	+	+		+	+	+	+	+		
2744. With scalp . . . . .	+	-	+	+	-	-	+	+	+	+	+	+	+		+	+	+	+	+		
2745. Women participate . . . . .		+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	-	+		
2746. Scalp on pole . . . . .		-	+	+	-	-	+	+	+	+	+	+	+		+	+	+	+	+		
2747. Pole set in ground . . . . .		-										+	+		+	+	-	-	(+)		
2748. Dance in circle . . . . .		+	+	+	+	+	+	+	+	+	+	+	+		+	+	-	+	+		
2749. Dance in lines . . . . .		-	-	+	+	-	+	S	+	-	-	-	-		-	-	+	-	-		
2750. Dance, 1 man, 2 women . . . . .		-	+	+	+	+	+	+	+	-	-	-	-		-	-	-	-	-		
2751. Musical instruments used . . . . .		+	+	+	+	+	+	+	+	+	+	-	+		+	+	+	-	+		
2752. Drum (pot) . . . . .		+	+		+	+	+	+	+	+	-	-	-		+	-	-	-	-		
2753. Buckskin "pillows" beaten (hands) . . . . .										+	+	-	-		-	-	-	-	-		
2754. Tambourine drum . . . . .		-									+	-	S		-	-	-	-	-		
2755. Wood drum, 2 skin heads . . . . .													+		-	+	+	-	-		
2756. Gourd rattle . . . . .																				+	
2757. Purification of slayers . . . . .		+	-					-	-	-	-	-	+		+	+	+	+	+		
2758. Clothes fumigated . . . . .													+		+	+	+	+	-		
2759. Clothes discarded . . . . .		-											S		+	+	+	+	-		
2760. Sweat house . . . . .		+	+	-	+	+	+	+	-	-	-	-	-		-	-	-	-	-		
2761. Bathing . . . . .		+	+	-	+	+	+	+	+	+	+	-	-		-	-	+	+	+		
2762. Continence . . . . .															+	+	-	+	+		
2763. Yucca wash . . . . .		+	+	-	-	+	+	+	S	+	+	+	-		+	+	+	+	-		
2764. Fasting (number days) . . . . .		-	-	-	-	-	-	-	-	-	-	-	-		4	4	-	-	30		
2765. Away from village . . . . .																				+	
2766. Vomiting . . . . .		-	-	-	-	-	-	-	-	-	-	-	-		-	-	+	+	-		
2767. Scratching-stick used . . . . .		+	+		+	+	+	+	+	+	+	+	+		+	+	+	+	+		
2768. Face blackened . . . . .		+	+	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		
2769. To evade ghost . . . . .		+	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		
2770. No victory dance if any losses . . . . .		+				+				+	+				+	-	?	-	-		
2771. War societies . . . . .		-													(+)	-	-	-	-		

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
POLITICAL ORGANIZATION																				
2772. Bands, autonomous . . . . .			?	+	+	+	+	+	+	+	+	+	+	+						-
2773. Villages, autonomous . . . . .	-		+	+	?	(+)	(+)	-	-	-	-	-	-	-						(+)
2774. Council . . . . .			-	(+)	(+)	-	(+)	+	+	+	+	+	+	-						+
2775. Family heads (elders) . . . . .			-	+	+	+	+	+	+	+	+	-	+	-						+
2776. Local headmen . . . . .			-	+	-	-	-	-	S	-	+	-	+	-						-
2777. Clan heads . . . . .			-	+	(+)	-	+	-	-	-	-	-	-	-						-
2778. Life tenure . . . . .			-	+	+	+	+	+	+	+	+	+	+	-						+
2779. Chiefs, etc.: designated by incumbent (see no. 2807) . . . . .			+	-	-	S	-	-	+	-	-	-	-	+						- -
2780. Hereditary . . . . .			+	+	S	S	+	(+)	+	+	-	+	-	-						+
2781. Selective (by people) . . . . .			-	-	+	+	-	+	S	+	+	-	+	-						- -
2782. Patrilineal . . . . .			+	-	S	S	-	(+)	S	S	-	+	-	-						+
2783. Matrilineal . . . . .			-	+	S	S	+	-	-	-	-	-	-	-						- -
2784. Fratrilineal . . . . .			-	S	S	S	S	-	S	S	-	-	-	-						- -
2785. Insignia . . . . .			-	-	-	-	+	-	-	-	-	-	-	-						-
2786. Special treatment . . . . .			+	+	-	S	-	-	-	-	-	+	-	-						-
2787. Chief's house large . . . . .			+	S	S	+	+	-	+	+	+	+	+	+						+
2788. Used for assembly . . . . .			-	S	+	+	+	-	+	+	+	+	+	-						+
2789. Hunt master office . . . . .			+	+	-	-	+	-	-	-	-	-	-	+	+	+	+	+	+	+
2790. Appointed by chief . . . . .			+	+	-	-	-	-	-	-	-	-	-	-						- -
2791. Hereditary in male line . . . . .			-	-	-	-	-	-	-	-	-	-	-	-						+
2792. War chief office . . . . .	+	+	-	+	+	S	+	+	+	+	+	-	-	?						(+)
2793. Appointive (prowess) . . . . .			+	-	+	+	S	+	+	+	+	+	+	-						-
2794. Self appointive . . . . .			-	-	-	S	+	-	-	-	-	+	-	-						+
2795. Shamanistic power . . . . .			?		+	(+)	+		+	+	-	-	-	-						(+)
2796. Civil chief is war leader . . . . .			-	+	-	-	S	S	S	S	S	-	+	-						S
2798. Head woman . . . . .			-	+	+	+	-	+	-	-	+	-	+	-						+
2799. Not hereditary . . . . .			+	+	+	+	-	+	-	-	+	-	+	-						+
2800. Official messengers . . . . .			+	+	+	+	+	+	+	+	+	+	+	+						+
2801. Appointed by chief . . . . .			+	-	+	+	+	+	+	+	+	+	+	+						-
2802. Hereditary . . . . .			-	-	-	-	-	-	-	-	-	-	-	-						+
CLAN ORGANIZATION																				
2803. Matrilineal . . . . .			+	+	+	+	+	-	-	-	-	-	-	-		+	+	+	-	-
2804. Patrilineal . . . . .			-	-	-	-	-	-	-	-	-	-	-	-						+
2805. Linked clans . . . . .			+	+	?	+	+	-	-	-	-	-	-	-						-
2806. Phratries . . . . .			-	-	-	+	+	-	-	-	-	-	-	-						-
2807. Clan "chiefs" . . . . .			(+)	+	(+)	+	+	-	-	-	-	-	-	-						-
2808. Clan name for all fathers . . . . .			-	-	-	-	-	-	-	-	-	-	-	-						+
2809. Totemism . . . . .			-	+	S	S	S	-	-	-	-	-	-	-		+	+	+	-	-
2810. Traditional origin places . . . . .			+	+	+	+	+	-	-	-	-	-	-	-						-
2811. Exogamy . . . . .			+	+	+	+	+	-	-	-	-	-	-	-						+
2812. Death for breach . . . . .						+	+	-	-	-	-	-	-	-						-
2813. Marriage allowed in one parent's clan . . . . .			+	+	+	+	+	-	-	-	-	-	-	-						+
2814. Kinship terms to unrelated clansmen . . . . .			+	+	+	+	+	-	-	-	-	-	-	-						-
2815. To all band or village members . . . . .			-	-	-	S	-	+	+	+	+	+	+	+						-
2816. To all tribe members . . . . .			-	-	-	S	-	+	-	-	-	-	+	+						-
2817. Reciprocal clan functions . . . . .			S	+	-	(+)	+	-	-	-	-	-	-	-						-
2818. Reciprocal band functions . . . . .								-	-	-	-	+	+	-						-
2819. Mortuary . . . . .			-	?	-	(+)	+	-	-	-	-	-	-	-						-
2820. Games . . . . .			S	+	S	+	S	-	-	-	-	+	+	-						-
2821. Moieties . . . . .			-	-	-	-	-	-	-	-	-	-	-	-						+
2822. Clans in each . . . . .			-	-	-	-	-	-	-	-	-	-	-	-						+
2823. No exogamy rule . . . . .			-	-	-	-	-	-	-	-	-	-	-	-						+
2824. Totemism . . . . .			-	-	-	-	-	-	-	-	-	-	-	-						+



	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	OI	SU	Wa	Zu	SA	SI	KP	HP
2869. Mountains . . . . .						?	-	?	-	?	-	?	+							+
2870. Other . . . . .									-	?										+
2871. Mountain lion . . . . .						?		?	+	?	-	?	?							+
2872. Bear . . . . .						?		?	+	?	-	?	?							+
2873. Consulting dead . . . . .																				+
2874. Possession . . . . .						-	-	-	+	-	-	-	-	-						-
2875. Training by older shamans . . . . .						+	S	S	S	+	+	+	?	S	-					S
2876. Jimsonweed for theft detection . . . . .						-	-	-	-	-	-	-	-	-			+			-
2877. Root in water . . . . .						+											+			-
2878. Women shamans for curing . . . . .	+	+				-	-	-	+	+	+	+	-	-						+
2879. For weather . . . . .						-	-	-	+	+	S	-	-	-						-
2880. Shaman killed for patient's death . . . . .						-	-	-	-	-	-	-	-	-						+
2881. For witchcraft . . . . .						-	-	-	+	+	?	?	?	?						+
2882. Witchcraft admitted . . . . .						+	+	+	+	+	+	?	-	-						+
2883. Attributed to women . . . . .						+		?	S	S	S	S	-							(+)
2884. Attributed to shaman . . . . .									+	+	+									+
2885. Punishment: crucifixion . . . . .								+	+	+							+			-
2886. Burning alive . . . . .								+	+											-
2887. Public (by council) trial . . . . .								(+)	+	+							+			+
2889. Animals connected with witchcraft . . . . .								?	?	+	+	?					+			(+)
2890. Rattlesnake . . . . .								+	+											(+)
2891. Bear . . . . .								+	+											(+)
2892. Wolf or fox . . . . .									+											(+)
2893. Masked performers help shaman cure . . . . .						-		+	+	+	+	-	-	-						+
2894. Shaman's equipment: flute . . . . .						+														+
2895. Flageolet . . . . .												+	-	-						-
2896. Rattle . . . . .	+	+	+	-	-	-	-	(+)	(+)	+	-	-	-	-	+	+	-	+		+
2897. Bull-roarer . . . . .	+	+	+	+	+	+	-	-	-	-	-	-	-	+						(+)
2898. Drum (pot) . . . . .						+	+	+	+	S	M	-	-	-						-
2899. Wooden cross . . . . .						+	+	-	+	+	-	-	-	-						-
2900. Turquoise . . . . .						+	+	+	-	+	-	-	+	+						-
2901. Eagle feathers on cord . . . . .						+	+	+	+	+	+	+	-	+						(+)
2902. Cane or wooden tube for suction . . . . .								-	-	+	-	+	-	-						S
2903. Bundle of amulets (see no. 2929) . . . . .																				+
2904. Special costume . . . . .						+	-	-	-	S	-	-	-	-						+
2905. Quartz crystal . . . . .																				-
2906. Pollen in curing . . . . .						+	+	+	+	+	+	-	+	+				+		+
2907. Tobacco . . . . .						-	+	+	+	+	+	+	+	-	+					+
2908. Sand painting in curing . . . . .						+	-	+	-	-	-	-	-	(-)						+
2909. Gila monster in curing . . . . .						-	+	-	+	-	-	-	-	-						-
2910. Corral for treating or purifying sick . . . . .								+	+											+
2911. Shamans' public performances . . . . .						-	-	-	-	-	+	-	-	-						+
2912. Legerdemain . . . . .						-	+	-	-	-	+	-	-	-						+
2913. Swallow eagle feather . . . . .							+			+	-	-	-	-						+
2914. Ventriloquism . . . . .						-	-	-	-	-	-	-	-	-						+
2915. Eating fire . . . . .								-	-	+	-	-	-	-						+
2916. Herbalists: men . . . . .						+	+	+	+	+	+	+	+	+						+
2917. Women . . . . .						+	+	+	+	+	+	+	-	+						+
2918. Bleeding . . . . .						+	+	?	+	+	+	+	+	+						+
2919. Ligaturing . . . . .						-	+	+	+	+	+	+	-	-						+
2920. Charms and amulets: eagle feather and turquoise bead worn on necklace . . . . .						+	+	+	-	+	+	-	-	-						-

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
2921. Eagle feather on shoulder.							+				+	-	-	-						-
2922. Eagle feather in hair . . .											+	-	(+)	-						-
2923. Beads (turquoise, shell, etc.) . . . . .					+		+			+	+	+								-
2924. Claws for warriors, hunters, shamans . . . . .	+	+								+	+	-	-	?	+					-
2925. Eagle claws . . . . .		+					+			+	-	-	-							-
2926. Bear claws . . . . .		+					+			+	+	-	-							-
2927. Mountain-lion claws . . . . .										+	-	-	-							-
2928. Arrow point as good- luck charm . . . . .									+					+						-
2929. Fetish bundle (see no. 2903) . . . . .																				+
2930. Song cycles . . . . .				+																+
2931. Some ceremonies: first fruits . .										+										(+)
2932. Harvest . . . . .										+										+
2933. Ceremonies in which masks worn . . . . .					+	+	+	+	+	M	-	-	-	-						+
2934. Prophylactic . . . . .								+	+		-	-	-	-						+
2935. Clowns with maskers . . . . .					+	+	+	+	+	S	-	-	-	-						+
2936. Races . . . . .												+	+	-						-
2937. Racers painted various colors . . . . .												+	+	-						-
2938. Prayers . . . . .	+	+			+	+	+	+	+	+	+	+	+	+						+
2939. Offerings . . . . .	+	+			+	+	+	+	+	+	+	+	+	+		+				-
2940. Pollen . . . . .		+			+	+	+	+	+	+	+	+	+	+						-
2941. Incense burned for sickness . . . . .								+	+	+	-	-	-	-						-
2942. Corn meal . . . . .																+				+
2943. Eagle ceremony . . . . .																				+
2944. Vigita (harvest) cere- mony . . . . .																				+
2945. Rain ceremony . . . . .																				+
2946. Harvest ceremony (other than vigita) . . . . .																				+
2949. Sun dance . . . . .														M						-
2950. Buffalo ceremony . . . . .										-	+	-	-	-						-
2951. Pray . . . . .										+	+	-	-	-						-
2952. Sing . . . . .										-	+	-	-	-						-
2953. Smoke . . . . .										-	+	-	-	-						-
2954. Ritual apparatus: sand paintings .	+				+	+	+	-	-	-	-	-	-	-						+
2955. Circular . . . . .	+				+	+	+	-	-	-	-	-	-	-						-
2956. Opening toward sunrise . . . . .					+	+	+	-	-	-	-	-	-	-						-
2957. Color symbolism . . . . .	?				+	+	+	-	-	-	-	-	-	-						-
2958. Cross in center . . . . .					+	+	+	-	-	-	-	-	-	-						-
2959. Persons (gods) represented . . . . .						+	+	-	-	-	-	-	-	-						-
2960. For curing . . . . .						+	+	-	-	-	-	-	-	-						+
2961. Directional circuit clockwise, E, S, W, N . . . . .					+	+	+	+	+	+	+	+	+	-						?
2961a. Directional circuit contra-clockwise, N, W, S, E . . . . .					-	-	-	-	-	-	-	-	-	-			+	+	+	?
2962. Color symbolism . . . . .					+	+	+	+	+	+	+	-	-	-			+	+	+	+
2963. Shrines . . . . .	-				-	-	-	-	-	+	-	-	-	-						-
2964. Trail-offering places . . . . .										+	+	+	+	-						+
2965. Prayer-sticks . . . . .	-				-	-	-	-	-	-	-	-	-	-	+	+				+
2966. Images . . . . .	?				-	-	-	-	-	-	-	-	-	-		+				+
2967. Painted slabs on head- dresses (see fig. in Notes) . . . . .	?				+	+	+	+	+	+	-	-	-	-						-

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
2968. Painted tablets in hands . . . . .					-	+	-	+	+	+	-	-	-	-						-
2969. Ceremonial knives . . . . .					-	?	-	-	+	+	-	-	-	-						-
2970. Knife shaped like arrow point . . . . .									+	+	-	-	-	-						-
2971. Used by shaman for lightning sickness. . . . .									+	+	-	-	-	-						-
2972. Peyote used . . . . .										M	+			M						-
2973. Taboos: to talk about lightning in summer . . . . .					+	+		+	-	+	-	-	-	+						-
2974. To tell myths in summer . . . . .					+		+	+	-	-	-	-	+	+						+
2975. To tell myths in day-time . . . . .					+		+	+	S	+	+	+	+	+						+
2976. To talk about bears in summer . . . . .							+	+	-	-	-	-	-	+						-
2977. Omens: owl . . . . .					+		+	+	+	+	+	-	-	+	+					+
2978. Struck by whirlwind . . . . .					+		+	+	+	+	+	-	+	-						+
2979. Sneezing indicates good luck . . . . .					+		-		+	+	-	-	-	-						-
2980. Sneezing indicates opposite sex talks about . . . . .					+	+		+	+	+	-	-	-	+						+
2981. Twitching ominous . . . . .					+	+	+	+	+	+	+	+	-	-						+
2982. Animal falling dead a bad omen . . . . .					+	+	+	+	+	-	-	-	-	+						+
2983. Supernatural beings still to be seen (not merely in myth) . . . . .					?		-	-	+	+	+	-	-	-						-
2984. Water monster . . . . .					-		+	-	+	+	+	-	-	M						+
2985. Eats people . . . . .					-		-	-	-	-	-	-	-	-						+
2986. Snake body . . . . .					-		+	-	-	-	-	-	-	-						?
2987. Feathered . . . . .					-		+	-	-	-	-	-	-	-						?
2988. Two horns . . . . .					-		+	-	-	-	-	-	-	-						?
2989. Buffalo-like . . . . .					-		-	-	+	-	-	-	-	-						-
2990. Water-baby . . . . .					-		-	-	-	-	-	-	-	M						-

## ELEMENTS DENIED BY ALL INFORMANTS

Hunting.—Trap with figure-4 trigger in dead-fall. Noose or net in pitfall.\* Snare for pigeons.\* V-shaped pound of stones. Other decoys than rabbits stuffed, etc.; gourd head covering in water as decoy. Animals other than deer, rabbits, antelope, and elk surrounded by people in circle. Driving into nets. Deer-hoof rattle as musical instrument in preparation for hunt; incense burned. Deer head and eyes to father's sister. Killer does not eat own kill until householder; deer only. Reptiles eaten: snakes, lizards, frogs. Insects eaten: earthworms, chrysalids.

Fishing.—Harpoon (detachable point). Fire for night fishing.\* Poisoning.\*

Gathering.—Weighted hardwood digging-stick for bulbs, roots. Cactus fruit rolled in sand with foot; shaken in sack or net. Seed receiver, carrier, etc.: Pima kioho type;\* Papago kioho type;\* Mohave string type;\* net, large mesh;\* single-string net hand bag;\* twined bags or sacks.

Food preparation and storage.—Acorns leached; stored whole in granary. Mesquite seeds ground on metate. Sotol fruit eaten. Bear-grass-yucca seeds eaten.\* Narrow-leafed-yucca seeds eaten. Cactus fruit dried without seeds; seeds re-eaten. Tuna (prickly pear) flowers boiled. Wild plum and cherry seeds only eaten; seeds ground. Wild plums and cherries leached. Grass patches irrigated. Alkali "salt" from burned plant. Earth eaten with mesquite. Meat broth thrown away. Pottery pot rests. Hide boiling. Cylindrical storage baskets. Granary on ground. Granary on platform: in tree;\* on poles.\* Buckskin water bag.

Agriculture.—Tools: stone-blade hoe on handle; horn-ladle trowel spade. Maize hilled when planted; stored in underground chambers. Teparies on trellises. Pumpkins and squashes eaten raw. Chia grown.

Pets.—Dogs for travois. Puppies nursed by woman. Foxes kept as pets.

Dwelling houses (exclusive of tipi and pueblo).—Rectangular, sharp corners. Rectangular corners cut. Paralleled sides, rounded ends. 2 end posts for ridgepole. Wall posts. Wall posts lower than center or ridge posts.\* Ridgepole. Rafters slope to walls;\* are parallel.\* Thatched huts with mats. Double brush wall. Double brush wall sand-filled. Roof separate from walls; gabled; sticks across rafters.\* Roof thatch in bundles.\* Matting on roof.\* Clay floor made when floor dug out. Stone paving when floor dug out. Smoke hole behind center; near door.

Tipi.—Camp circle.\* Mats as material over poles.\* Mat as door.\* Embroidered ornament.\*

Pueblo.—Sticks laid by women.\* Gypsum burned for whitewash.\* Flagstone floor in living room and other rooms.\* Lower-story rooms filled in.\*

Assembly (ceremonial) house.—Entered by door.\* Dance place (ceremonial structure) is any house; house of giver of ceremony.

Shades and enclosures.—Shade roof built around court. Circular enclosure of boughs (corral) set up after sunset. Diamond-shaped enclosure. Circular enclosure with 4 openings for mask wearers of girls' ceremony.\* Women's huts for menstruation;\* for childbirth.\*

Sweat house.—Direct fire. Used at night.

Navigation.—Dugout. Ferriage in pot (infant, etc.).

Grinding.—Metate of irregular oval type (rotary). Flageolet (flute) at grinding. Portable stone mortar of supernatural make.\*

Brushes.—Swab of grass bundle.\*

Stirrers and stone lifters.—Loop-stick food stirrer. Loop-stick stirrer lifting stones out of basket.

Receptacles (other than basketry, pottery).—Small ladle of antelope horn. Steatite dishes.

Awls, needles, knives.—Cactus spine, Shell knife.

Drilling.—Bone awl for shell drilling. Bone awl for pottery drilling. Composite drill with bone point. Vise for drilling; held in one hand; held by toes; split stick; perforated stone.

Flint flaking.—Flaking with bone punch struck. Retouching by pressure with bone flaker; hafted flaker.

Grinding and polishing stone.—Hafted pick for roughing out.

Fire making.—Bow drill.

Skin dressing.—Skinned hanging.\* Bone knife.\* Hide dehaired with scraping sticks. Worked soft without brains.

Bow.—Nearly straight bow, length of man. Sinew-wrapped tips recurved. Tips ornamented with deer hoof; other. Composite bow with horn. Wood from special side of tree.

Arrows.—Foreshafted: arrowweed. Harpoon arrow: bone pointed; for fish. Arrowheads: horn. Arrow poisoning: from liver and venom;\* ashes;\* salt;\* mineral.\* Arrow release: tertiary; Mongolian; bridge-type wristguard on bow.

Arrow straightening and smoothing.—Transverse groove with crosshatching on top, for pyrography. Scouring-rush polisher.

\*Asterisk indicates that inquiry was made among 4-9 groups; for all others, among 10 or more.

Spears.—Double-pointed (both ends). Hurled.

Shields.—Mt.-sheep head skin, buckskin inner surface; elliptical, of rawhide; imported.

Armor.—Helmet: 4-ply buckskin; entire head. Armor of mescal plates, front and back. Cotton armor.

Clubs, etc.—Clubs set with flints. Atlatl. Bolas.

Ornamental shell, stone, bone work, etc.—Cylindrical shell beads as ear pendant; as nose stick. Frog-shaped clam gorget. Columella as nose stick. Bone: nose stick; hollow (bird). \* Wood: cane nose stick. Feather: in ear.

Adhesives and pigments.—Arrowweed gum. Red mineral (from scum of pools). Red paint and fat on body for warmth.

Body and dress.—Hair: shell tweezers; cane tweezers; men's side locks cut square at mouth level. \* Coiffure: men wear hair in 2 folded clubs; hair secured with hair cords; men's hair in long gummed rolls; white feather on youth's hair braid. \* Hair ornaments: hair net; wooden hairpins; bone hairpins. Hair mud plaster to kill vermin. Mesquite gum in mud plaster to dye black. Hardwood louse killer. Mutilations: yucca-leaf needle for piercing girls' ears; mescal spine for piercing girls' ears; enlarging of pierced ear hole of girl; lip piercing; nose flattening. Tattoo: horizontal or radiating on cheeks; \* legs tattooed; \* bundle of mesquite spines; \* green vegetable pigment, followed by charcoal. \* Shell-stick ear ornament. \* Clothing: basketry cap (technique under Basketry). Woven rabbitskin worn equally much as used for bedding. \* Woven birdskin. Robe of netting with turkey feathers attached. Women's gowns: buckskin dress with butcher-gown strap, of buckskin; cotton, embroidered. \* Loin covering: belts of bast fibers. Breech-clouts: woven birdskin. Buckskin apron for men. \* Kilt of woven rabbitskin for men. One-piece "skirt": of Cowania bark; \* of willow bark; \* of yucca fiber; \* dewclaws perforated with burning stick, tied on buckskin skirt. \* Hands and arms: muff. Leggings of yucca fiber. Footgear: soft soled; three-piece. Snowshoes: circular-withe type. \* Bedding (mattress): yucca-fiber pad; \* twined mat of Cowania bark. Bedding (blankets): twined mat of Cowania bark.

Sitting postures, greetings, etc.—Sleep with head to (N,E,S,W).

Miscellaneous personal effects.—Walking stick with netted ring (for snow).

Basketry.—Burden baskets: openwork. Basketry technique: coiling with 2 rods and welts. 3-strand twining for decoration. Checker weave plaques. \* Basket types: seed beater of unwoven hoop and sticks; \* of spoke warps. \* Winnowing, sifting, and parching trays: triangular, diagonally twined; oval, twined; oval, of parallel rods; tray made for gambling. Coiled basket

plaque of 2d Mesa type. Water bottles: with round bottom; with pointed bottom; yucca-fiber loop lugs on bottle; wicker weave (Navaho). Miscellaneous: more than 2 colors in pattern for white sale only. \* Tools and materials for basketry: Epicampes rigens (bunch grass); desert willow; cattail (Typha); yucca braid; brown dye from burnt mescal. Cradles: kite-shaped ladder cradle; cross sticks dowelled, wrapped; yucca lashings for cross sticks; basketry band of hood twined; belt (lashing) of vegetable fiber; pack strap woven on frame; pack strap woven; pack strap braided.

Cordage.—Apocynum; nettle; milkweed; tepary bean; coated: \* pitch. \*

Knitting.—Crocheting.

Rabbitskin blankets.—Perforated to twist skin; \* split stick to twist skin. \* Weaving: warp 2-ply of skin; \* 2-pole horizontal frame; \* coiled (sewed); \* birdskin blanket made same way.

Loom weaving.—Fibers from maguey (agave); \* from yucca. \*

Pottery.—Manufactured with ashes; with shell. Coiling with anvil, mushroom-shaped pottery object. Polished with steatite; with sherd. Kiln. \*

Games.—Women play football or stick race; \* hoop used in football or stick race; \* 1 ball to each participant; \* if 1 ball, side wins by 1st ball in; \* kick alternately (enforced rule); \* sides are clans. \* Goal: hole; \* red posts (bent pole). \* Three-base game: betting. \* "Shinny": wooden ball; hoop; double ball (2-knotted cord); stuffed buckskin "double ball"; separate game when ball picked up and batted; driven with netted stick; driven with basket racket; running with puck in stick or racket permitted; sides are clans; sides are moieties. Hoop-and-pole ("pitching pole"): cord-wrapped hoop; hoop of wrapped bark; short-stick "hoop." Ring-and-pin game: feathers with weights of piñon gum. Peon: hollow "bones"; \* white of bone, black of wood, etc., for "bones"; \* special call words; \* game by individuals, 1 arranging all four pairs under basket. Hidden-ball game in 4 tubes marked at end, middle, both, none: 4 tubes called young men; 4 tubes called young women. \* Dice games; markings with old men, old women, young men, young women; with end-middle-all-0; with end-middle-all-2 ends. 3-stave game: subtraction by erasure; knuckle bones; score with counters. Various games and toys: pottery-disk top. Acorns for juggling.

Pipes.—Of bone; double-bowl pottery pipe.

Tobacco.—Mixed with suckling-rabbit gut contents; mixed with pine nuts for smoking; eaten with lime.

Musical instruments.—Rattles bought; tortoise-shell rattle; turtle-shell rattle painted; \* antelope-hoof rattle; loop handle on deer-hoof rattle; cocoon rattle on handle; cocoon rattle attached to knees; many-stick rattle; split-stick rattle; two

sticks tapped together. Notched rasp used as toy only. Hollow-log gong; foot drum (plank over pit). Bull-roarer as summons, call. Bone whistle (double); wooden whistle. Flute holes measured by knuckles.\* Flageolet reed of fiber;\* holes (steps) are grouped;\* for dances.\* "Trumpet" or "horn"; with gourd bell.

Calendar.—Calendar sticks (year tallies); rock marked for year count.

Messages (mnemonic).—Beads slipped over stick, feather, bone; marked cane.

Constellations.—Wildcat's road, Milky Way;\* Ghosts' road, Milky Way;\* falling stars, tobacco thrown by spirits; falling star as spirit excrement; electric fire ball a cannibal spirit.

Eclipse.—Other noise made than shouting, wailing, singing; vessels turned over.

Earthquake.—Person under turning over.\*

New-moon observances.—Horizontal means rain; vertical means drought.

Birth.—Parturient has feet in heated pit; buckskins or blankets over hot stones; navel cord put in gopher skin; afterbirth buried in house; twins feared; both twins killed; still-born cremated. Ceremony of running, first daybreak after birth.

Boys' puberty observances.—Nose piercing.

Girls' puberty observances.—Girl covered with hot sand; bone scratching-stick; bone drinking-tube; twined yucca-fiber belt.

Regular-menstruation observances.—Fish taboo;\* heated pit.

Marriage.—Polyandry; eating of pollen and tying robes together as symbolic acts of marriage; bride carries presents to mother-in-law until 1st child; father daughter-in-law avoid-

ance with address in plural; sibling-in-law avoidance.

Dead.—Bundles with back broken; dropped in; string leads from grave (N, E, S, W); string toward house for young child; slaves destroyed with corpse. Soul destiny: ocean;\* lake;\* Colorado Canyon;\* clouds;\* young child's soul awaits mother's death. Purification of corpse handlers by burning clothes (if not naked); fasting.

Land ownership.—Hunting and gathering areas are family owned; lineage owned; clan owned.

War.—Preparations by fasting; prisoners slain later; heads as trophies; hands as trophies; skull (or bones) preserved; scalp used for decorating belt, spear, etc. Victory dance with head. Counting coup.\* No mourning for warrior dying from wounds.

Political organization.<sup>5</sup>—Council annually selected. War-chief office hereditary; brave man automatically becomes war chief. Orator (crier, "speaker"). Camp police for hunt.\*

Clan organization.—Clan name for all females;\* palladium (spec.).\*

Kinship systems.—Cross cousins equal uncle-aunt, nephew-niece.

Religion.—Shamans acquire power from creator;\* shaman used jimsonweed; jimsonweed leaves eaten by shaman.\* Shaman's equipment has other drum than pot.\* Herbalists have medicine bundles (Plains type);\* sun, moon, morning-star cult;\* vision seeking apart from shamanism.\* Altars as ceremonial apparatus; sacrificial cigarettes as ceremonial apparatus. Pole climbing.

<sup>5</sup>From here on no inquiry made among 2 Navaho and 4 Pueblo groups.

## ETHNOGRAPHIC NOTES ON THE ELEMENT LIST

### HUNTING

Even the most sedentary agricultural groups of the Southwest are ardent hunters. Moreover, among them, preparatory rituals for hunting are more closely guarded secrets than among the Apache or the Papago. Navaho culture, however, is overburdened with hunting ritual. There are four "religious" ways of hunting, one informant said. Indeed, when hunting one sort of animal they did not molest another.

Deer, antelope, and rabbits were the most widespread and important game animals, with buffalo on the edge of the Great Plains.

By individual hunters the mask decoy was widely used for deer and antelope. However, communal surrounds and drives were also attempted.

Deadfalls, pitfalls, and snares were utilized by about half the groups interviewed. Their feeble development is an example of the weakness of Southwestern culture on the mechanical side. The possibilities of the dog as an ally in hunting were largely neglected.

Whether a group ate deermeat more frequently than antelope meat was a matter of environment. For example, the Ol hunted deer in their own country but antelope and buffalo to the eastward; whereas the Ll depended upon buffalo and antelope, which were the chief game animals in the Cimarron region. For deer and elk they journeyed to mts. to west, but only occasionally, because of abundance of buffalo and antelope.

#### Individual (or Small-Group) Hunting

2-9. Mask decoys for hunting. In mts. for deer, in open country, for antelope and buffalo.

2. ST masked hunter sometimes killed by mt. lion; wore no protective bone hairpins. WM no deer mask as "animals easy to take." Me mask in rutting season dangerous; sometimes hunted elk with it. Ll sometimes held grass screen, instead mask. SI deer mask in dance, not followed by hunt. (See Nambe Deer dance, Goddard, p. 114.) WS, Zu deer mask to stalk mt. sheep; WS wild cattle.

3. Antelope mask. ST used at Mbovine, nr. Pleasant v. WM only means. Me also to stalk prairie dogs. NT hunter in white cloth crawling through brush sufficed.

4. SA buffalo mask long hair halfway down back. Me sometimes used antelope mask for buffalo with rifle. Li stalked buffalo by crawling among bushes. Hu used no masks for wild cattle.

5, 6. Body covering of hide or cloth. NT painted buckskin. ST cloth from Hopi, painted. Hu modern painted canvas. SA preferred painted, woollen cloth to hide, lighter weight. KP skin on mask to wearer's shoulders only.

7, 8. "Front legs" of stalker short sticks or bow and arrows. NT stick in one hand, bow and arrows in other. SA bow and arrows; if animals very shy, short sticks so bow ready.

9. EN yucca fiber fabric over chest, arms white

and blue with mineral pigments, to imitate antelope. Ci wrists white.

11-18. Calling of game. Sounds with mouth, usually with aid of fingers, leaf, grass stem, or bone whistle. WN not call deer for fear of supernatural punishment if deer ran around them. Antelope called, songs to charm them. Informant declined to give call in house. EN leaf in mouth or rabbit-bone whistle for rabbits. NT lured doe by imitating, with leaf in mouth, cry of fawn attacked by coyote. SC antelope's curiosity sometimes brought it within range. Me antelope with ocotillo leaves in mouth; one hunter, lying down calling, trampled by male. Li rabbits by blowing through grass stem, end alternately open and pinched shut. Ll leaf in mouth to call deer, antelope, buffalo calf; calls differed. SU rabbits with whistle of rabbit leg bone; piece split off one side of bone; sinew wrapped near each end of larger remaining part, making "reed"; smaller piece lashed back in place. Wa crow call to make fleeing deer or antelope turn back. If killed quarry, called like wolf (no. 125), as signal to other hunters. Zu turkey call by splitting cane, winding one split portion with sinew for "reed," lashing whole together again; blown through, not sucked. Zu masked hunter called antelope or deer by holding lips with hand, filling cheeks, expelling breath explosively. Fawn made to cry so doe came. SA leaf with stem bent back in mouth to imitate fawn. SI leaf in mouth for squealing sound for rabbits. Turkey-bone whistle for wild turkey, quail, deer. Fleeing deer stopped by whistling with two fingers in mouth; SA likewise. KP called quail with arrow against lips; shot with sharp-pointed solid-wood arrow, no foreshaft or head.

19-24. Running down or wearing out game. Introduction of horse facilitated. Ol did not wear out game by persistent pursuit, "because animals plentiful." In tracking abandoned one track when fresher one found. HP wounded animals only.

19. WN ran down deer on horseback. Ci on foot in one day, if weather hot; otherwise tracked deer next day. Wa late forenoon best time to begin; water in gourd canteen, boomerang, bow, arrows; sought biggest track. Measured with stick; when close crippled with boomerang, dispatched with arrow. SA marked deer track with stick at nightfall. When animal lay down frequently hunter knew near quarry. Antelope more difficult.

20. WM hunted elk with bow. Ol, SU killed elk but did not wear out. Zu informant knew of only 2 killed. HP hunted horseback.

21. WM hunted bear with bow; wounded, it might be lanced by agile man. Hu addressed respectfully and urged to go on way; hunter promised same. This was Navaho attitude, except WN killed bear and mt. lion for "medicine" purposes. Me did not track bear, but sometimes killed for food. SU usually shot by 3 or 4 men from different angles. If ferocious after wounding, left till following day.

Zu killed bear only when deer hunting; brought to priests for winter dances, when head carried. SA struck wounded bear over nose with ball-ended or straight club. If in cave, suffocated with smoke. SI hunted bear with dog; treed, killed.

22. NT hunted mt. sheep with bow in Fossil Creek region. SC, WM, Ol hunted mt. sheep in own countries, went to lower country for antelope. Plains dwelling Ll went west to mts. to stalk mt. sheep. SI, HP sometimes shot mt. sheep from cliff or ledge overlooking rock shelter where sheep resting. Sometimes SI built rock blind at such vantage point. KP did not regularly hunt account difficult terrain.

23. In snow rabbits chased to burrows or hollow logs: NT, Ci, WS, Ol, Zu, removed by hand or by twisting stick. Wa, SA, SI ran down rabbits in snow. Wa cottontails sometimes escaped in rock piles, but not jackrabbits. SA said if rabbit had clay on feet, then snow balled on them.

24. SU wet quail unable to fly, easily taken.

25-32. Deadfall traps. Stone or log released so as to kill or maim quarry. Trigger-bar type (28), with three sticks held in unstable equilibrium by string, sprung when animal stepped on bar; useful on trail of rodent or rabbit. Baited-trigger type (29) for rodents, pictured in EDN, p. 322. For medium-sized carnivores (coyotes, etc.) weight usually log, against which stones leaned to give additional weight, arranged to form 3 sides of rectangle, so quarry under log could not jump sidewise when seized bait (usually rat or venison) tied to string running to trigger.

27. SA log trap which breaks deer legs: 2 logs laid parallel and horizontally on slope, one higher than other. Higher one balanced on round stones so slight touch dislodged; string trigger tripped by deer.

26, 31, 32. NT, ST log deadfall with baited trigger, for coyote. SC three types of deadfall traps for coyotes, all baited: (a) like rodent trap, but heavily weighted; (b) log and side walls of stone which collapsed; also for wildcats; (c) coyote stuck head through hole to get bait; stone fell and broke neck. Ci took coyotes, wildcats, and mt. lions with (b). Zu used (b) baited with dried meat, stone substituted for log, for coyote and wildcat, whose skins for dances; animals not eaten. SI took coyote for dance skins with (b), baited with woodrat. WM, SA took coyote, wildcat, fox with bow; wildcats usually treed, also by NT when snow. HP coyote deadfall with stone weight and stone side walls.

28. On trail of rodent or rabbit unbaited trigger-bar deadfall trap mostly used by NT, ST; altogether by Ci, WM. SC took tree squirrels (not Abert's) in Pinal mts. with it. SI took squirrels for dance skins.

29. Deadfall trap with baited trigger for rodents. Ll took rabbits, mostly jackrabbits. EN rodents, rabbits, wildcats, coyotes. Zu birds, wood rats. Wa doves, rats, badgers, coyotes.

Wildcats taken by trailing; if treed, brought down with stone or arrow; if in hole, strangled with bowstring made into noose on end of bow, or stabbed with sharp stick when mouth opened.

33-35. Traps for taking quarry alive. WS square cage of willow sticks, lashed together at corners with Spanish bayonet-leaf fibers, buckskin, or rawhide; open at bottom, propped up with stick, which pulled out by string by concealed watcher. Part of top opened to extract quarry (rabbits, birds). Ll arranged trigger for door of cage trap, so quarry set it off; trap 3 or 4 ft. in diameter, of chokecherry or willow, set in trail. Bait deermeat, rabbit, or ball of maize-meal mush. Animals caught: coyote, bobcat, bear, mt. lion.

34. Pit trap for taking birds alive. Wa baited dug hole with maize meal; slab of stone propped by stick, which jerked out by watcher pulling string attached to it.

35. KP, HP pit trap baited, bottom set with horsehair attached to cage of sticks, open at bottom, propped over pit. Quail and other birds touching strings caused cage to fall. Supporting stick in two pieces with joint in step form, one resting on other, and horsehair tied to upper.

36-38. Nets for game. Ll of horsehair, 8 to 10 ft. deep.

39-48. Pitfalls for game. ST, Ll, SI plain pit without impaling stakes or straddling bar. Wa knew both devices. WN employed stakes; EN, Ci, Zu used bar.

ST informant knew of pitfall only once; patterned after "pitfalls" of mythical (probably natural) origin near Ligaishak village. Ci placed pit in narrow part of trail between bushes or piled brush to make trail narrow so deer could not avoid pitfall. Ll caught elk, deer; sometimes rabbits. Pit dug with digging stick; when deep a hide used to remove earth. Wa pitfall covered with small twigs, juniper bark, earth. If desired undamaged hide, used straddle bar instead of impaling stakes. Zu pit had transverse as well as longitudinal straddle bar. SI sometimes found bear or mt. lion in pitfall.

44. Depth of pit in feet: WN 7; EN 8; ST, Wa, Zu 6; SI 9.

48. ST, Zu pits in zigzag series; Wa in straight series.

49-66. Rodents, etc., in burrows. SC plugged rabbit burrow short distance from mouth, so easily extracted with hand. Ol took rabbits, not prairie dogs, wood rats, and other small rodents, since deer, antelope, buffalo readily obtainable. Ol nowadays flood out prairie dogs near maize fields, but do not eat them. NT sometimes caught rats or mice in water jar, not used as trap.

49. Ci killed squirrel in tree hole by smudging. WS killed smudged animal with straight-stick club as it emerged. Me smudging was boys' way of taking rodents. Ll smudged rabbits. SU fanned smoke into burrow with sage branches.

50. WS, Me, Ll, SU took prairie dogs during heavy summer rains, by digging channels to con-

duct water to burrows; emergence of animal indicated by bubbles; pinned down with forked stick over neck or dispatched with stick.

51. Zu filled prairie dogs' holes with dirt and clubbed animals as they dug out.

52. KP, to extract rabbit from burrow, twisted arrow in fur. Mt. lion once extracted from hole with ocotillo stick, then shot with bow. HP used pointed stick for extracting rabbit. Wa sometimes tied two sticks together to reach rodent in burrow.

54. Zu rabbit in snow tracked to nest in hollow log, removed with sharp, saliva-moistened stick twisted into fur. SI removed quarry from burrow with notched or roughened stick which spat upon. EN said wounded cottontail rabbit might run away with arrow, but not jackrabbit.

59. SA sometimes used hooked stick for rabbit in burrow. Wa used such for wood rat shot in hole, if not extractable with arrow.

60. Me shot prodded-out wood rat with arrow. Zu wood rats in rock hole in summer, in wood-covered nest in winter; prodded from latter and shot by waiting archer. Bit of wood-rat fur and blood sometimes put in hole to attract others. SA stunned wood rats and birds with blunt arrow or one with maize cob on end. SI shot wood rat with stone-headed arrow or struck with stick as emerged. KP, HP prodded wood rat from nest with ocotillo stick; shot with sharp-pointed all-wood, featherless arrow.

61. NT did not burn wood-rat's nest, because others would occupy. WM sometimes burned tree-squirrel's nest to force animal out.

62. Wa special featherless arrow (1110) with two greasewood barbs tied on, for wood rats and prairie dogs. KP, HP for wood rats. Zu very long, feathered, 3-barbed arrow (1111), for wood rats in spring and summer when they and young in rock hole. After shooting, immediately seized proximal end of arrow to draw out animal. Arrow had barbed-flint head plus two flint barbs tied to sides below head.

63-65. Special devices for prairie dogs: WN lured by reflection from crystal (?) or mica. "Animal comes out to see what it is and is shot." Actual or blinding? Too many connecting burrows to smudge out. WN special arrow with two cross sticks, which caught in burrow when animal wounded. WN, EN long arrow with hook or barb at butt for seizing by hunter. EN hunt early morning at burrow facing E so emerging animal blinded. This suggests WN reflector was not for luring but for blinding. (EDN, p. 476.) Hu bow for rodents, but no special-type arrows. SU special feathered arrow with very broad barbed stone head; butt seized by hunter. SA no special devices, prairie dogs rare. SI ordinary stone-headed arrow.

66. HP plugged all but one desert-rat burrow exit, bored with stick, blew through hole, rat felt draft, ran to exit, seized.

67-70. Flares for blinding birds. EN, Me, Zu, SA blinded turkeys by fire under tree roosts; easily shot. NT ate geese, but no flares for. For

perching birds, old pitched basket cut up and lit atop long pole; birds attracted from surrounding trees, struck down with brush bundle. SC, Ci, WM flare of sticks for quail, doves, etc., which shot or knocked down with stick. Hu flare gave light to shoot turkeys, quail, etc. Ol hunted turkeys by day only, with bow; Ll used flare, either seizing birds by legs, or shooting them. KP torch of ocotillo stalks tied with narrow-leaved yucca for quail, mourning doves, white-winged doves, which shot with bow. HP shot geese and ducks on Gila r.; used greasewood torch. WS shot silhouetted turkeys on moonlight nights. Wa used no flares, but sometimes climbed cottonwoods about midnight and caught crows by feet.

71-87. Snares. Self-snare commoner type. Some snares for birds for food, others for ceremonial purposes: Navaho, Wa, Zu. No snaring of wild pigeon as in California. WM, Hu sometimes shot pigeon with bow; no other method.

71. EN, Wa several baited horsehair snares attached to stick on ground, for birds (meadow-larks, Wa), which usually caught by feet. Hu sinew snares for crow, sparrow hawk, turkey, quail, etc. Bait (meat for crow or sparrow hawk) scattered inside snare and bird usually caught by foot. Zu caught jays with snares set on two perches beside ear of maize, also snare on ear. SA horsehair snares on ground or bushes near spring, for robins and snow birds. HP snared coyotes, using cowhide rope set near dead horse and concealed with earth; hides for blankets.

72. Zu, SI two bars, one above another, under shade. Upper too close to shade for birds to sit on; from it series of snares hung. Lower bar placed so birds must stand in snares; their weight caused perch to sink, drawing nooses tightly around neck or feet. Birds for ceremonial use.

73. Zu, SI fence, 2 ft. high, around water hole. One large opening for entry, smaller ones with snares of horsehair. Man hidden in brush booth frightened turkeys after they had entered. They rushed for nearest exits, caught in hair nooses, clubbed.

74. Zu horsehair snares attached to floating sticks for whippoorwills. SI horsehair snare, anchored to notched-stone sinker, held open with little stick, for ducks and geese in baited ponds or stillwater of Rio Grande. When bird submerged head for maize or wheat it snared itself.

77. EN self-snare of horsehair, attached to vertical stick projecting up in center of noose. When bluebird alighted on stick it sank, closing noose on victim. Bluebirds skinned by shaman for own use.

78. WN snare with noose at top of hollowed sunflower stalk (EDN, p. 323), for jays (probably bluebirds) and yellowbirds. Wa similar snare for goldfinches, of horsehair, set on top of sunflower stalk from which head removed. From horsehair noose, string ran down through hollowed stalk and out side opening, where stick tied as stop to prevent bird flying off with snare and string. Also took with snares under cottonwood

trees, baited with live worms; sometimes shot with arrow with maize-cob head, to avoid injury to skin.

79. Zu wild-sunflower stalk as site of snare. Noose held open with stick on which bird perched, releasing noose, which drawn tight by suspended stone.

80. SI bent twig as spring to pull snare tight, as shown in EDN, p. 323. Bird, perching on stick which held snare open, released snare which spring instantly drew tight.

81. EN, Me, Li snares from trees for wild horses; EN sometimes deer. Inability to lasso wild horses led Me to try hanging nooses. Ll raw-hide noose in deer trail. SA deer snares for feet.

82. WN, Ll eagle snare with meat bait at nest. SI set on dead rabbit, or on partly skinned horse or cow; vultures came too, but not wanted.

83. Me, Li took turkey vultures with 3-looped horsehair snare on dead animal; wing and tail feathers plucked for arrows, bird released. Ll snared hawks.

84. Ll snared rabbits.

85. Wa snared mt. sheep by lowering noose from cliff to where sheep at rest; pulled quarry to top of bluff.

86. Li horsehair snare on stick as child's toy to catch tarantulas, scorpions, vinegaroons, bees, etc. These put in little stick corral to watch fight.

87. Ll, Ol, SI snared fish with horsehair noose on pole; caught in gills; jerked out of water.

88-102. Booths, blinds, and decoys used by hunters.

88, 89. WN hid behind rock piles for various animals. Ci hid in stone-and-brush blind in saddle of two hills, while deer driven past; also might shoot coyote. WM circular stone blind to which deer driven. ST erected 2 1/2 ft. stone-wall deer blind. Me shot antelope from brush blind; quail from same at drinking place. Li brush hut near water hole to shoot game. SU rock-and-brush blind in autumn where migrating antelope passed. None for deer. For mt. sheep low rock blind with trench in which hunter lay; usually at overhanging rock under which sheep passed; set up rock so sheep would climb to position where hunter got clear shot. Deer blind, pit with brush fence beside deer trail, used moonlight night or early morning. Zu brush blinds where turkeys drank at sunrise; shot, also pursued and shot as attempted to fly. Smaller birds shot from blind with forked arrow with one straight, one curved point. SA shot ducks from blind; to attract birds, hunter splashed with stick similar to ducks alighting. Rock-wall blinds, some with brush on top, for shooting deer, antelope, buffalo. Blind sometimes circular, with loopholes. SI 2 or 3 brush blinds over shallow pits at salt lick or drinking place for shooting antelope; stone-wall blinds in arroyos for antelope. KP behind brush or rocks at water

hole to shoot deer; brush blind for dove shooting at water hole.

94. Zu, SA brush hut or blind on surface for adult-eagle catching; no pit. SA sometimes live-eagle decoy (102); seized eagle by leg with hooked stick.

97. EN eagle catcher had shaman to make "medicine" with him in covered pit, lest get boil or carbuncle. If several caught, one released without plucking after putting 5 turquoise beads on one foot and 2 strings of them around neck. Others killed and plucked.

#### Communal Hunting

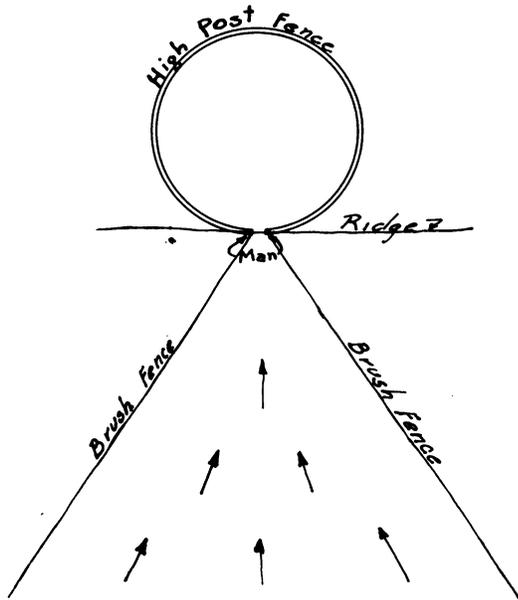
103, 104. Hunt master. Ranged from man who served for one occasion to hereditary official. NT chief appointed antelope and rabbit-hunt master, who made "medicine," which informant declined to tell because dangerous during summer when thunderstorms. ST chief appointed temporary rabbit-hunt master. Ci men planned surround; one clever at this suggested where each of 20 or 30 take station. WM hunt master, man who knew where deer were, took party, which might stay 7 or 8 days; directed building of hunters' camp corral, cooking therein, etc. One man, given duty of caring for corral and cooking, hunted only in vicinity. Hunt master selected 5 or 6 to sweat with him and discuss hunt; they thought only of deer and prayed for luck. WS hunt master for surround made no medicine; no fixed office. Me, Li man who proposed rabbit hunt was hunt master. SU hunt master for buffalo made no medicine. Wa crier announced rabbit hunt night before, specifying meeting place. Two leaders started encircling pincers movement. Zu 2 antelope-hunt masters termed ochiyacha; called like mt. lions (125). SA hunt masters were war chief and assistant; in surround they led 2 groups in pincers movement. KP hunt master (topitûm) hereditary office from father to son. Sent two hunters as heads of pincers movement in surround. HP dual hunt masters succeeded by sons approved by hunters. Only one hunt master on hunt at time.

105-111. Surrounding of game. Element of driving involved, since animals enclosed by narrowing circle, but not to be confused with driving (nos. 112-124). See notes 103, 104. ST only young antelope; caught by hand, killed by pressing foot over heart. Ci shot all deer and rabbits surrounded. WS deer in flat mesquite country around Deming surrounded by mounted archers; antelope same. (Informant never heard of prehorse days.) For cottontail and jack rabbits, men afoot or on horseback used boomerangs. Li rabbits only, afoot or mounted. Ol tried to take elk by surround in mts. SU bow for surrounded deer or antelope, boomerang for rabbits. Zu clubbed rabbits, shot deer. Wa best marksmen shot deer while others surrounded. In rabbit surround sometimes sitting rabbits shot, but boomerang used at height of action. SA killed rabbits from horseback, long-handled ball-ended

club wielded, not thrown. SI antelope surround with as few as 20 men; arrows or hurled knob clubs to dispatch. (No corral.) Deer sometimes killed by head blow from hurled knoberry. KP antelope surround on horseback only, using bow. (No corral.) Hunt master sent someone before dawn to locate antelope.

112-124. Driving game, other than surround.

112-114. Circular corral with funnel approach constructed so corral invisible to animals entering funnel, achieved by building on 2 sides of ridge or in curved valley or canyon. Figured below: WN high circular fence of vertical posts below crest of ridge, but with opening near crest;



from opening two diverging brush fences. Two men stationed at "neck" (i.e., where funnel fences joined corral), to prevent animals escaping. Horsemen formed wings at funnel fence outer ends to prevent driven animals going outside fences and so funnel entrance appeared only line of escape. EN same, of juniper and piñon branches; funnel fences quarter-mile long. Shaman (hunt master) stood in corral, while antelope driven by footmen waving white cloths or skins. 12 men sufficed; 2 stood at neck to prevent escape. All shot, except one released for good luck. First 12 to shaman; laid in row with heads toward entrance. Shaman told hunters to divide remainder.

NT antelope corral 100 yards diameter, of juniper branches and trunks laid flat, funnel fences 1/8-mile long, built over ridge. Two men at neck; 6 or 8 men calling like wolves (no. 125) drove antelope; 4 men went to center and shot down milling animals, each shooting in one of four cardinal directions. One released for good luck. Antelope taken on edge of Verde v., none in Strawberry v. Mormon Lake band of NT also used antelope corral. ST used none.

L1 corral approach, brush or stone fences forming funnel; for antelope driven by horsemen; not for buffalo. Zu funnel fences of branches 2 or 3 miles (sic) long; corral of same materials in small curved valley. Horsemen (sometimes 200) drove antelope. Two men at neck of corral called like crows as antelope entered; stretched deer-hide rope with blankets across entrance, weighted at bottom with stones. Hunters came to "gate" and slaughtered with bow. Extra high corral of logs and foliage for deer. SA no corral for antelope; cornered in box canyon, high-walled canyon, or arroyo.

115. Driving game over cliff or bank. NT promontory on S side Fossil Creek canyon (near place where modern highway starts down canyon wall from Strawberry v.), connected with main rim of canyon by narrow isthmus. Deer on this promontory driven over cliffs. Me one instance, driving large buffalo over cliff. L1 4 adjoining funnel fences on edge of arroyo, where animals fell off and broke legs when driven through, usually by horsemen. SU drove deer and antelope to cliff promontory; two men remained at isthmus, others shot quarry or drove over cliffs. Zu knew instances deer forced to jump from cliffs (of Thunder mt.).

117. Lassoing game. Hu, Me, Li, L1, Wa, Zu sometimes lassoed antelope. Hu rawhide rope. Li 4-strand, round, rawhide braid. Wa from horseback, modern practice. Zu lassoed corraled antelope or deer. HP deer with rawhide rope from horseback, if lacked bow or gun; modern.

118. To cause game to pass hidden hunters most frequent purpose of driving. Ci 2 hunters on knolls between which deer trail; 3 or 4 men drove deer. WM drove elk to concealed hunters in narrow canyon. Hu, KP drove deer to hunters hidden in pass; Hu antelope driven to concealed hunters. Me horsemen drove antelope over ridge to line of waiting horsemen; antelope started circling, shot down by both groups.

119. Fire as an aid in driving game: EN shaman specialist in deer hunting, doskati. If deer on small hill readily ringed with fire, fire started with drill and deer manure placed in it. Horseman ignited torch of juniper bark, swiftly encircled hill, firing brush. Deer stupefied by smoke, readily killed. WM rabbits with ring of fire with opening, where men clubbed or shot rabbits. WS fire for driving rabbits only. Zu fire for hunting antelope on horseback, but not driving into corral.

SA fires forced deer to certain trails where rawhide snares, rolling-log traps, concealed hunters. Men sent by war chief to locate game before hunt began. If on mesa, all but one trail down closed. Fires threw quarry into panic. Hunters, concealed at strategic points, shot animals.

KP fire in rabbit drive only; struck down with straight sticks; no nets used. Hunters on foot formerly. No praying or singing preceded rabbit hunt.

120. Driving with dogs rare, except wounded animals. WS dogs in antelope drive, not deer drive. Me antelope too swift for dog. Zu drove deer with dogs, not antelope. SA dogs to drive or corner deer and antelope, not buffalo. Buck turned on dog, allowing hunter to get closer. Sometimes dog held deer by ear or hind foot. Dogs used by groups as well as single hunter. SI dog in leash tied belt, released to pursue wounded deer; sometimes allowed to raise unwounded deer. Instance of large dog holding deer by ear.

121. EN horsemen ran deer on hard snow. Men at different stations took up pursuit to frighten deer, so it might go through snow crust and break leg. Young fawns of deer and antelope killed with stick—no special club.

122. Ol horseman hunted antelope with bow.

123. Many peccaries in Li country; shot with bow; killed by hitting across back with heavy stick, then stabbing with spear. Others might come, forcing refuge in tree. HP dogs for peccary hunting, as peccaries stood for fight, making close approach by hunter possible. Me peccaries in Sacramento mts., sometimes speared, which risky as wounded peccary sometimes "bit it off."

124. Me buffalo hunt on horseback, groups rather than lone hunter. Li likewise, about 20 horsemen pursuing and shooting—no surround or pound. Ol hunted buffalo from horseback with bow (horses derived from "Spaniards"); no ceremony. SU horsemen circled buffalo herd and stampeded animals toward hunters hidden in washes or arroyos. No corral. Hunt master made no medicine. SA hunted buffalo from horseback—no corral or surround. If possible, drove into narrow gorge, where lance also used. Buffalo bone more easily shattered with arrow than cattle bones. SI hunted buffalo with fast horses.

125. Carnivore calls by hunters. WN hunter calling to another imitated mt. lion; referred to another hunter as mt. lion. Two or 3 Ci hunters arranged signals by mt. lion, coyote, crow, etc., calls; thus crow might mean deer approaching. See also notes 11, 103, 112.

#### Dogs

126. (Cf. 120.) ST, SC, Me dogs not numerous.

127. Ci hunter trained by putting foot of deer, turkey, rabbit, over dog's nose. Zu trained dog; fed mt.-lion meat. SA, HP dogs trained to bring in rabbit or squirrel; if not, hunter followed to prevent dog eating. Some SI dogs trained to hold rabbit with paws until hunter came; others seized, shook rabbit or squirrel.

129. Running down wounded game, especially deer; barking led hunter to spot.

130. Me dogs treed turkeys, quail.

131. SC dogs caught rabbits, fawns, etc.

133. ST, Hu dogs undesirable because barking revealed to enemies. Me dogs to guard camp: 5 Comanche attacked isolated hut of Kahoane

Mescalero near present site of agency. Family had several vicious dogs and because of that protection lived somewhat apart. Dogs badly bit some of Comanche, aiding family to drive them away.

#### Religious Preparations for Hunt

Religious or magical prehunt observances with all groups. Smoking, singing, praying were chief activities. Continnence and nonassociation with menstruants required of Navaho, certain Pueblo, and Papago hunters, but not of Apache hunters with whom matters sexual were not believed to spoil the hunter's luck. Sweating before hunt was Navaho, W Apache, and S Ute practice. Papago, some Pueblo, and some Athabascans erected a corral for camp while hunting. Wa and SA informants declined to discuss hunt preparations. Daughter of SA informant told him not to tell; did not want whites or Negroes to know secrets, because "this is life of Indians."

135. Singing rite before hunt. EN shaman taught deer songs to hunters; various series, for pitfall, for horseback hunt, for hunting corral, etc. NT chief assembled hunters at his house. Smoked ca. 9 P.M.; sang 4 deer songs. Shaman predicted number to be killed and when. ST hunters sang in dwelling for half of eve of hunt; no females present. 5 or 6 SC hunters at behest of chief discussed hunt, sweated, smoked, prayed to gan spirit in charge of deer for success: "May I have good luck henceforth; and do thou let me have another deer." If no deer after 2 or 3 days, singing rite at initiative of hunt master. In Hu prehunt singing rite, only individuals who knew deer songs sang. Prayed god Nayitizone and chadjada (W Apache gan), guardian of deer. Me, like Hu, prehunt ceremony at home, not in corral; smoked, sang, prayed. Myth related how man and wide without proper ceremony killed a man-deer. In punishment woman transformed into doe, lost forever to husband, who saw tracks of big buck leading to hut. Man afraid to stay there, slept on hill where dreamed of happenings to his wife. Zu coyote-society singing rite before hunt. SI singing before deer, antelope, or buffalo hunt was praying. HP songs in smoke-keeper's (chief's) house for deer-hunt success referred to deer, not addressed to any god; gave power to kill deer. Shamans directed where to hunt. No deity prayed to.

137. Ci with pollen in fingers prayed to Sun who owns deer and can see where they are; also to goddess Istlenatlehe, coöwner of deer. Ll pollen in fingers, motioned toward sunrise in praying to mts. for deer-hunt success.

139. EN prayed to Hacheski, guardian of big bucks, and Hacheskini, guardian of does. Hacheski appeared as tall god with crown of eagle feathers in masked performance witnessed on night of October 4, 1935, at Shiprock, New Mexico. Ol prayed male deity Yidayesguni (Lipan Nayi'izone); very little singing. Learned nothing of equivalent of W Apache gan. SI deer-hunt god was

Mt. lion, to whom maize-meal offerings when praying. KP prayed Huotam (Maize Man) for deer; not necessary for antelope.

142. Li women too prayed 4 nights before buffalo hunt. Man or woman led song and prayer in own tipi. Prayers to Nayi'izone, and to his deputy Gaidjishgiye (Crow Black) who had charge of buffalo and deer. Pollen in prayer, but no maize meal or turquoise. Women accompanied men, erecting skin tipi or brush hut for camp, cooked for party.

144. Zu smoked maize-husk cigarettes 4 nights before hunt. SI smoked oak-leaf or maize-husk cigarettes.

145. KP hunters started without breakfast.

146. ST ate only mescal; no meat, no salt, when starting. Me ate no "wild onions" before deer hunt, lest bad luck. SI ate very little meat before starting; principally maize; salt allowed. HP ate maize while hunting.

149. EN hunter, to avoid taboo, slept with fire poker between himself and menstruating wife, on opposite side of hut.

151. ST sweated day before hunt; sang, talked about deer therein. Li did not sweat for buffalo hunt. SU sweated, prayed creator Nomaromapugat.

152. Corral in hunt region. WN camped in; entered clockwise. Deer hides on S side enclosure; deer hearts on brush pile on W side. Cooked meat not blown to cool. EN constructed evening before hunt. Left side (as entered) associated with quadrupeds and horseback hunting; right with birds. In leaving proceeded clockwise; must not pass between wood pile in front of entrance and entrance. Sang in corral each night, led by shaman. Bows, arrows stacked during preliminary singing ceremony. NT campfire burned at night. Bows, guns on log pointing E, sung over. Gun might discharge while shaman sang. After killed 3 or 4 deer returned to village. Wa sometimes built corral of branches, sang at night to "lure" deer.

Zu man who knew deer medicine prayed first night out, went to sacred place between 2 mts., prepared shrine by digging hole and sprinkling maize meal; returned to corral. All to hunt next day went to shrine, deposited feathered prayer sticks. On 4th night one man's face painted with medicine of certain flowers from Arizona: stripe from inner corner of eye to top of ear opening. He deposited pulverized medicine as offering to forefathers at shrine. At 10 yards from corral he stopped to see or hear something; if nothing, moved another 10 yards and paused; so on until heard sound like water in arroyo, or some other noise. Good omen; returned to corral. Given tobacco to smoke while relating what heard. KP, HP cycle of deer songs about "hunter of long ago" at night in corral, addressed to Huotam (Maize Man) who bestowed deer-hunt success. Maize-husk cigarettes smoked. Slept part of night. No singing or praying prior to antelope hunt. Deer hunt took more time than antelope hunt; more deer than antelope eaten. Rabbit eaten most, because easiest to take.

154. WS one-night masked ceremony before deer hunt, 2 maskers representing sazada (W Apache gan). Each hunter marked cross of pollen on each impersonator's chest, back, shoulders; in brush corral with entrance toward E, some distance from habitations. Old women witnessed and prayed for sons' success. 4 songs sung for sazada. Besides 2 spirit impersonators, each hunter who owned deer mask danced in it to accompaniment of drum; no stick front legs used.

156. KP hunter sang until deer tracks found.

157. Prayed to gan wood spirit to be allowed to kill deer. Gan controlled or owned deer.

NT, ST said deer were "cattle" of gan, WM "horses." WS called gan sazada. NT also prayed to Mt. Lion and Wolf. ST to Mt. Lion also. SC informant's father saw "500 men" impersonating 4 gan spirits at Wheatfield; some carried live fawns. WS offered pollen to gan in 4 cardinal directions.

159. WM smoked and prayed to gan. WS used pipe, or cigarette of inner skin of yucca, sotol, or oak leaf; or maize husk. Me prayed, sang in hut before starting. SU smoked stone elbow pipe with wooden stem, to cause deer to approach. HP smoked, but careful lest deer smell and flee.

160. WS prayed god Nayitizone as well as sazada who have "charge" of deer. Li invoked gods Nayi'izone and Gaidjishgiye with prayer, song, and tobacco smoke on night before hunt. Cigarette of oak leaf, maize husk, or sotol-stalk leaf.

163. Zu only group addressing prayers for hunt success to dead; information volunteered.

164. EN strewed maize pollen, praying for success that day; offered turquoise on deer tracks if failed after 2 or 3 days. WS offered pollen of cattail, maize, or piñon in praying for hunt success. Zu laid turquoise and maize meal on deer track.

165. KP sprinkled gray mineral powder where deer had lain to cause return. When damp smelled for half mile. Not dampened, however, for deer. Another powder, sleep-inducing, called gositaku, from bark of tree on Gomatiki mt., S of Poso Verde, Sonora, sprinkled where deer lay; reputed to put men to sleep, especially if sprinkled in fire; odorless. HP obtained letter from 4-branched tree growing near Sonora border. Carrier must keep moving lest fall asleep.

166. EN hunter who knew medicine wore turquoise amulet for deer hunting.

167. Me, Li hunter's bracelet of stone beads (sometimes from Navaho, but usually found): one turquoise, one jet (hardest to find), one white bead, one red bead.

#### Observances after Kill

167a-169. Deer hide laid on carcass, animal or deity addressed. Hide laid head at tail, then head at head (EN); head at head, then head at tail (WS, SU); 4 times in one direction (NT); once (SC, Ci, WM, Hu, Me). WS also for antelope, mt. sheep; SU also antelope. Wa covered deermeat with hide in hunt corral.

Burden of prayer always for continued success. EN, Ci, WM, Hu, Ol, SA, HP: "May I kill more." NT asked for father, brother, etc., of slain deer. ST: "May I kill a deer again." SC: "May I have good luck everywhere." WS: "May I have good luck and kill another." Me: "May I have good luck all the time." SU: "May I always kill big ones." Li prayed slain deer or buffalo not to be angry, not to interfere with hunt success. Zu put maize meal, pollen, and turquoise (173) in little hole beside slain deer and prayed deer to come again. KP note 175. HP hunters of coyote moiety first prayed deer for further success and long life; then vulture-moiety hunters did likewise. NT denied belief in reincarnation of deer.

Deities addressed: Gan (NT, ST, WM), hunting gods (WS), Sun and goddess Istlenatlehe (Ci), god Nayitizone (Hu), god Yidayesguni thanked (Ol), god Nomaromapugat thanked (SU), Mt. Lion thanked (SI). SA, before skinning deer, rubbed bit of deer's hair over deer's body, praying to protector deity of game animals (deer, antelope, buffalo, bear, mt. lion, rabbit, turkey, etc.) for success again. Hair preserved in hunter's home.

170, 171. Pointing deer. WN deer on pine branches with head toward hunting corral. Throat not cut, lest bad luck. Deer, antelope, elk butchered in ritual fashion. (At this point informant's daughter objected to his telling about ritual matters.) EN deer on cleared ground, head toward hunter's home. Must not pass in front of it while skinning, lest spoil luck. Care in skinning around caruncula at eye corners, non-breaking eyeballs and bones, lest illness. Shaman lectured nightly on how to kill and butcher deer, taught deer songs to hunters. Ci on brush. Hu, Li large buck headed to E. Li did not orient buffalo, nor KP deer.

172. Deer's nostrils plugged. NT so other deer less wild. Zu tied or held wounded deer or antelope's muzzle to suffocate; throat not cut across because skinned from chin to vent. KP plugged with special grass before skinning "to prevent flying insect called chilbatata coming from nostrils and making hunter and family sick." Insect more like bee than fly; no bite or sting; apparently supposed deleterious effect supernatural.

173. Offerings. For Zu see note 167a. SA pollen and maize meal to slain animal, not turquoise. SI sprinkled maize meal on slain deer. Deer, antelope, buffalo also sprinkled with maize meal at home; tobacco smoked.

175. KP offered raw deermeat to Gopio'otam (enemy hair spirits) at kill, in prayer for continued hunt success.

176. SI hunter washed hair with yucca suds, body with water for 4 days after killing deer, antelope, buffalo.

178. Purification in sweat house rare, not always religious. NT sweated to offset fatigue, Ci "just for wash." SU washed only hands after skinning deer; blood elsewhere came off when sweated about 5 days later; same for bear.

179-181. Zu women sprinkled maize meal on deer or antelope meat outdoors when brought by hunters. Parts reassembled in house, skin laid over, then woman's dress, necklace of turquoise. Maize meal sprinkled and prayer that spirit would come again in another. Two ears maize laid between front legs. Cigarette smoke blown on deer's head. After few minutes meat might be cooked. Visitor must pray animal get another life. SA laid large-game mammals and turkey in living room with head toward fireplace, covered with blanket and necklace. HP smoked after kill, not as offering.

183. HP danced in deer masks in village for one night after successful hunt.

184-186. Special acts for bear. EN moved hunt corral and put new shaman in charge, if forced to kill bear in self-defense. NT killed bear if hunter knew medicine for killing with single arrow; "another might use 100 arrows and not kill." Prayed slain bear and gan so no bad luck. ST addressed bear as mother's father and asked it to go away. SC formerly ate bears which killed with bow or knife. But informant told of following 2 bears, which killed girl, to den and killing with gun. Carcasses taken to old San Carlos, danced over, not eaten. Ci said: "I am going to shoot you. I want you to die with first arrow." Meat eaten; skin for blanket. WM addressed bear as mother's father before shooting. WS as father's father, asked it to go away. Me, not desiring to kill, said: "Please go your way and I'll go mine." Hunter who tired of urging bear in his trail to move and shot at it with rifle. Li woman as well as man killed bear without addressing it, using spear of sotol stalk with stone knife tied to end; bears not dangerous, easily killed. Ol, finding track, said: "Here is the one who made a track last year." Not called grandfather. Killed only in self-defense. SU discussed what to do when bear encountered; neither bear nor deity addressed.

Zu treated dead bear like deer or antelope (notes 179-181). Hunter prayed bear for strength and long life. Slayer entitled to join certain medicine society. Women of society danced all night with him. 4 paws became society property, skin presented to person who acted as sponsor if he joined society. No bear society. SA never laughed at bear. After killing, said how necessary was hide to keep family warm and meat for food. SI war songs after killing bear. Eater of meat marked charcoal on cheek bones to avoid sickness. KP never killed bear because like human being. Did not address as grandfather, but merely told to go its way and hunter would go his. HP killed no bear lest swelling in neck, abdomen, etc., about year after.

187, 188. Me who had opportunity to kill 4 deer must let 1 go. SU sometimes allowed last of cornered antelope to escape; no corral used. SA released one of several entrapped deer, antelope, buffalo.

190-195. Division of game. Difficult subject for element list because definite rules rare and practice varied with number of hunters. Element-

list entries based largely on assumption of two hunters, only one of whom kills deer. WN deer slayer got inside parts only. His companion took hide; anybody sinew. Head and brains not taken, as goat brains for tanning—obviously modern. Spinal cord with vertebrae divided. No special assignment of other parts. Distributed at home. Later, killer might eat some of meat. EN killer got heart, lungs, kidneys, etc., ribs on one side; ribs on other side to someone else. Hide, fat, head, horns, brain to killer's companion. Horns must be cut from skull carefully. Any person received sinew. NT gave away spinal cord; removed with stick; used for buckskin. Carcass carried home after gutting; divided among villagers. ST divided meat among companions, keeping none himself, not even viscera; when someone else killed he got share. SC sinew for asking. If 5 hunters killed only one deer, ate it at once; did not take home. If 5 got 5 deer, divided among neighbors. Mother-in-law and father's sister got no extra. Brains cooked in ashes, packed in grass, for buckskin. If 2 Ci killed one deer, meat divided between two, who divided among neighbors. Spinal cord split. Cut animal down middle with improvised split-stone blade. WM, WS, Hu, Li recipient of hide got head for brains for buckskin. WS gave companion choice of parts. If only one of pair of Li hunters killed deer, he gave to companion, who skinned and gave back some. Ol hunter sometimes gave animal to companion; reciprocation later; no special distribution to relatives. SU, if 5 hunters and one deer, divided 4 quarters and ribs equally among companions. Killer kept hide, backbone, rump. One who got ribs got head. After cooking head and eating meat therefrom, gave skull with brains to killer for tanning hide.

Wa deer slayer gave sinew to companion if 2 hunters only. If more, first comer got front and hind quarters on one side; second got same from other side; third got blood. Killer kept rest, boiled head with ear of yellow maize in mouth. If brought whole deer home, hunter's wife took front or hind quarter to his parents. Zu hunters might receive one or 2 whole animals apiece in case of corral killing. If 2 hunters and one deer, killer got hide, head, backbone, ribs and legs on one side. His companion got one front leg, one hind leg, and ribs on one side. If 3 or 4 hunters, killer kept share as above, but balance divided among others. If fifth man he got viscera. If deer wounded by one, killed by another, latter counted as killer. A woman, spying hunter with meat, might say: "Thanks. Are you coming now?" Hunter compelled to give her some. If 5 in SA party and one deer, each of 4 (including killer) got one leg; fifth man got viscera. Killer kept rest: head, hide, etc. KP slayer not compelled to give companion any share. No regulations concerning division of meat. Deer brains slightly cooked, mixed with grass to preserve for buckskin; spinal cord not used. HP killer divided part of meat among companions.

196-210. Butchering customs. Generally large game butchered where killed and on ground. See notes 170, 171.

196. HP butchered kill if knew proper method and songs; otherwise might develop bleeding from penis and ultimately die.

197. Ci might carry fawn home to skin. KP might carry deer to village to skin, if killed close; eviscerated to carry.

201. KP skinned suspended if possible, otherwise on brush laid on ground. Skinned deer cut longitudinally for carrying, not down middle of spine but close to it; ribs broken with improvised stone knife or ax. Good flint knife reserved for skin or flesh cutting.

202. Ci hide owner carried meat home in hide; others tied in bundles.

203. EN, ST, WS, Hu, Li, SI yucca leaves to tie deermeat in bundles. If too much meat to carry WS, Hu, Li left some on branches of tree or bushes, to be returned for. Me, Li tied meat with tendons from front legs. Li sometimes used rawhide rope. SU carried buckskin cord around waist for tying meat. If no buckskin, used split yucca leaves. Zu carried hide rope. If meat carried in hide, legs tied together.

204. WN informant replied concerning drinking warm blood and eating raw liver: "Only coyotes and foxes do that, not human beings."

205. WS ate small pieces of liver and kidney raw and warm; for good health. Hu raw kidney. Me both raw, dipping in blood. Li both, raw or cooked.

206. WM ate deer liver cooked at home.

207. Zu cut off udders of doe and drank milk. KP hunter nearly dead of thirst drank amniotic fluid.

208. EN gave first deer slain to shaman who taught him songs for deer hunt. SU youth did not eat first deer, antelope, buffalo, but gave to old people. Must not give to girl lest be lazy all his life; same penalty if ate himself. HP youth gave first kill of each species to old person, often own parents. Recipient wished success for him as hunter. With all 20 groups no rule against veteran hunter eating own kill.

209. NT youth had to kill fifth of each species before ate own kill; ate of fifth. KP youth gave first 4 kills (deer, rabbit, etc.) to old hunter who breathed on him and prayed be good hunter like himself. Youth ate fifth animal killed. No taboo against skinning kill. Alternative procedure in which youth's mother cooked first deer and invited old people to partake. Neither youth nor family ate. If this done youth ate all subsequent kills.

#### Animals not Eaten

Taboo, believed poisonous, or merely avoided were not numerous; attempt made to record in element list which of these. Such discrimination found almost impossible to make from informants' answers. Consequently, in the element list I have entered + for not eaten, - for eaten.

211. Bear. EN lest stomach trouble ensue. ST ate sometimes; head boiled to extract teeth. WS did not eat as bear might have eaten person. Hu lest get rheumatic fever. Me child allowed to eat first time after proper prayer recited by elder. Ll killed for hides only. Ol said distasteful, not eaten. Wa no bears formerly; now sometimes shot with rifle because of killing calves. Zu ate bear and mt. lion only if members of society (name?) using bear's feet in ceremonies. KP did not kill or eat bear, wolf, or mt. lion, because respected like brave men.

212. Mt. lion. SC killed, but informant did not know if eaten. Ci killed for skin for quiver; sometimes ate. WM killed for hide, but never ate. WS ate, since mt. lion lived on "good" meat. SA did not kill. KP hunted only after it killed domestic animals; never ate.

213-215. Wildcat. Hu superstitious dread of killing wildcat. Zu wildcat, coyote, wolf meat bitter, hence not eaten. KP usually ate coyotes in December when least odor; at that time "deer had bad odor." HP ate no coyote because respected by totemites. ST ate skunks.

216, 217. Eagles, hawks. EN hunters sometimes ate eagle and certain hawks. WS, Hu ate no eagle or hawk because they ate rattlesnakes. Some SU ate young eagles; rare, and person not necessarily shaman. Wa ate Bald Eagle, but not Golden Eagle, because latter "regarded Walpi people as his children."

219. Other birds. WN ate wild turkeys and small yellow bird. WM ate wild turkeys; feathers for arrows. Ol wild turkey only bird eaten. Me took ducks with arrows; geese seen flying, none taken. Wa took swimming ducks with sling or with bow and arrows. SI ate wild turkeys and eggs.

#### Fetuses and Eggs

220. WN ate fetuses of mammals without restriction. Skin of deer fetus tanned for medicine bag. Ll ate fetuses of buffalo, antelope, deer. SU young person not allowed to eat fetus lest become lazy.

221. WN, EN, Ol ate no birds' eggs, except turkeys' (EN). NT small children ate no quail eggs lest freckles. Ci taboo against quail eggs for young attributed to greed of elders.

222. KP young people eating quail or their eggs got eye trouble. HP young people ate quail eggs, but must not touch eyes with fingers lest sore eyes.

223. Zu do not blow on hot chicken eggs lest get freckles.

#### Reptiles and Insects Eaten; Cannibalism

225. HP seized chuckwalla with hand, struck head against rock. After gutting, stuck tail in mouth, roasted in hot ashes.

226. HP cooked tortoise in earth oven with hot stones inside tortoise, coals around outside.

227. WS turtle for food and medicine.

229-235. Insects or insect products as food rare, except honey. WN informant, when asked about insects as food, contemptuously countered, "Why ask foolish questions?"

229. KP brown caterpillar with black stripes, about 4 in. long, in summer after heavy rains. Head pinched off, entrails pulled out; bodies "braided," boiled in pot, dried in sun on branch or timber to preserve for short time; or ate at once. HP black and green caterpillars.

230. KP children principal eaters of yellow-jacket grubs.

231. Li grasshoppers on hot stone or over fire; eaten by children especially.

232-234. Honey, aside from introduced Old World bees, from ground-nesting bumble-bee and from black "bee" which deposited honey in hollow sotol stalks. Me had all 3 in S part of their territory.

232. When NT stepped on bumble-bee burrow and bitten he told chief, who sent men and boys with digging sticks; usually stung during this digging. Honey eaten, not grubs. Ol smoked out bumble-bees. Zu took bumble-bee honey from hole in arroyo bank.

234. Li honey from comb on rock wall, apparently introduced Old World bees.

235. Honeydew, saccharine exudate on plants, dissolved off flowers by Wa. Zu from willow leaves. Use denied by KP and HP, despite Yavapai attribution their own use from Papago example (Gifford, 1936, 268).

228. Zu cannibalism legendary: When starving while living W of Hawikuh long ago, children eaten.

#### FISHING

Eight of the 20 groups investigated used fish for food: WS, Me, Li, Ll, Ol, SA, SI, HP. SA made the least effort to take fish, utilizing only stranded ones; informants said neighboring San Felipe people were expert fishers, however. Fish were not eaten by 2 Navaho groups, 5 Western Apache groups, Hu, SU, Wa, Zu, and KP.

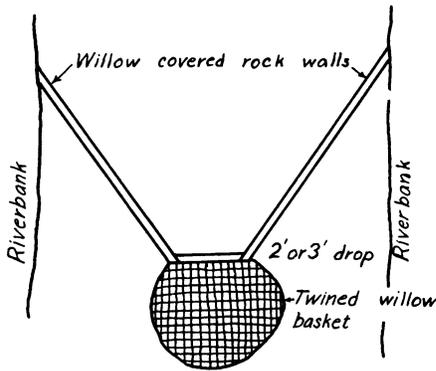
WS took "mt. trout," "bass," catfish with spear of sotol stalk with flint point (241), or arrow with stone or bone point. Fish 2 ft. long in San Francisco r.; sometimes stranded at high water (243). Feathered fish arrow (246) of Apache plume wood; sometimes wooden barb attached with string and pitch. Fishing in moonlight, daylight. Yucca fibers through gills and mouth to carry.

Me angled (249) in Rio Grande in Texas to S of Guadalupe mts.; also in shallow sloughs. Fish about 15 in. long.

Li boys sometimes shot fish with bow (244); usually caught in shallows with bare hands.

Ll handled scoop (237) of willow-withe grill secured with 2-ply willow-bark string; hoop frame. Fish carried by stick or cord through gills.

SI constructed weirs and traps (238-240) in Rio Grande. (Illustrated below.)



Two walls of stones ran downstream from river banks to form funnel. Stones between double fences of willow twined around stakes driven into river bed. At end of funnel timber 2 or 3 ft. high over which water poured. Fish passing over this caught in large twined willow trap, semicircular in floor plan; floor sloped upward on downstream side. Semicircular fence formed wall of trap and prevented escape.

SI brush fence at low water to divert water to one side of river. Men and some women drove fish into shallows, striking them with 3-ft. stick, also tossing out on bank with bare hands. Stick also to strike fish swimming near surface during muddy freshet. Fish carried in man-made, 2-handled, twined basket, of ancient type, by 2 men when loaded.

HP not fish in Gulf of California. Fished in Gila r. with small bag net (236) called chuaka (also applied to carrying net), also with bow. For latter, fish driven into shallows with bundles of long greasewood by wading men; bow and arrowweed arrow (246) with radial feathering (2 feathers, sometimes 3). Bag net (236) of 2-ply, leg-twisted, mescal-fiber string woven without mesh measure or needle on ring of cord which formed mouth of bag; dragged by 2 men, while others drove fish; no wooden rim or wooden handle.

#### GATHERING

All twenty groups visited made use of wild plants for food in large measure. All ate *Opuntia* and *Yucca baccata* fruits. Sweet acorns, piñon nuts, walnuts, mescal, and mesquite pods were eaten apparently by all groups to whom accessible. In spite of agriculture there was much dependence on wild plant products. Naturally the degree of dependence varied, with non-agricultural groups like Lipan at one extreme, expert farmers like the Pueblos at other.

257-262. Digging-stick. EN of greasewood, wild cherry (not chokecherry), etc. Whittled with knife, rubbed down on sandstone. ST of manzanita.

Ci, Hu digging-sticks for all purposes (not mescal alone) chisel-bladed. Hu 3 ft. long. Mescal stick bigger (larger diameter than pickaxe handle). Any digging-stick driven with cobble if ground hard. WS digging-stick pointed, mescal one chisel-bladed and cobble-driven. Hu ate bulbs and corms. Me pulled up wild "onions" by hand after rain, otherwise used digging stick. Li ate 4 species of bulbs and corms. Ll, Ol boys and men shoved juniper or oak digging-stick into ground with butt against abdomen when digging "camas" in spring. SU oak digging-stick for wild "potatoes." Wa greasewood stick for bulbs and roots. Some modern Zu digging-sticks had footrest and were hip length; for wild roots and planting maize. SA footrest stick as planter only; straight stick for wild roots. KP, HP of ironwood. (HP stated Sand Papago ate root which made teeth black.)

262. Mescal digging-stick 3-6 ft. long.

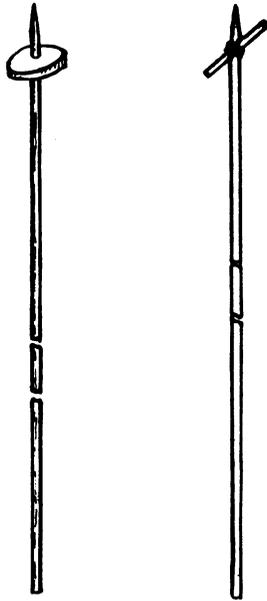
264-272. Long poles for food gathering, ranging from straight stick to pole with special device on distal end, seem to be adaptations in part to tall, spiny, food-yielding plants of region.

264. Straight long poles used chiefly for knocking acorns and piñon nuts from trees. EN did not beat piñon trees "lest bears attack beaters," nor shake trees lest violent wind arise; nuts collected from ground. NT, ST knocked off 2 kinds of juniper berries. SC straight ocotillo stalk for acorns; piñon collected from ground. Ci for acorn beating and shaking piñon nuts from cones on trees; walnuts better if fell naturally, but sometimes climbed and branches shaken. WM for acorns; piñon nuts fell naturally. WS acorns with sotol stalk, sometimes from horseback. Hu, Me, Li for piñon nuts; pecans and acorns from ground. Ll, Wa for piñon. Zu did not beat or climb oaks or piñon; collected from ground. KP, HP beat jajoba berries from thorny bushes. HP beat acorns in mts. outside Huhula territory, but oftener from ground.

265. SU fork-ended long stick for beating piñon trees.

266. KP, HP for pitahaya cactus (*Lemaireocereus thurberi*) fruit, pole with pointed end and concave spoonlike stop few inches below point. Fruit impaled on point, prevented sliding down pole by "spoon." (See fig., p. 92.) Burst if fell to ground.

267. Pole with lashed-on diagonal crosspiece near end, primarily for fruit from saguaro (*Carnegie gigantea*). Usually of dead saguaro ribs. Crosspiece tied so that 2 acute angles formed with pole. With upward projecting arm of crosspiece fruit detached by upward push, with downward projecting arm by downward pull. (See fig., p. 92.) WS for piñon and acorns. Some groups also used pole cut to include stub of forking branch as natural hook (269). ST used both, applied single name meaning "stick hanging down from (crosspiece) it is."



268, 269. Crook-ended and hook-ended poles by SA for pulling down dead branches for firewood; by SI for bending wild cherry and plum branches, and nowadays apple branches. Me used latter for shaking down acorns.

272. Names for poles: ST ante (267); SC called both straight (264) and hooked (267, 269) kapane; Ci straight and diagonal-crosspiece poles (264, 267) gaspane; WS, like SC, called 3 types soto. Hu distinguished straight (264) pole (peanangaiet) from hooked (267, 269) poles (peopehe); as did KP and HP. HP pitahaya pole (266) and saguaro pole (267) kuipas.

273. Sticks thrown to knock off nuts. WS acorns, Li pecan, SU piñon. At times climbed; sometimes with sapling leaned against trunk (ST, Ci, Hu, Me, Zu, SI). Men and women climbed (EN, Ci, Me, Zu, SI); men mainly (NT, ST, WS, Hu, Li, Ll, Ol, SU, Wa, SA, HP); women mainly (SC, WM).

274. Bent-stick tongs. Me sumac, oak, willow, green sotol stalk (pounded where bent); Li willow, oak; Wa oak thinned at bend, string around limbs to keep from spreading; longer tongs for hot stones. Papago reported Pima bent-stick tongs for cactus fruits.

275. KP, HP tongs 2 flat sticks tied at handle end; called vaho.

279. Spines brushed off fruit. NT, ST laid on grass, brushed with bundle of grass. SC grass for brush called hushbeshuwe. WS some brushing before picking. Hu snakeweed best brush. Me snakeweed, sage stems, grass. Li collected fruits in rawhide bag, spread them on ground, brushed with "weeds." SU mixed juniper bark and (or) grass with fruits to collect spines, then brushed with juniper foliage. KP palo verde stems; certain small cactus fruits stirred in basket with stick to loosen spines, winnowed.

282. EN, Wa woven blanket to collect. Me, Ll buffalo rawhide.

283. Carrier. WN any basket, piece of hide,

etc. Hu collected in burden basket, transported in skin sack, at camp poured into pottery and oaken vessels. KP collected in basket, carried in buckskin sack in kicho carrying frame. Ci carried in buckskin sack. WS, Me in skin saddlebag; WS sometimes in 2 burden baskets on sides of horse.

## FOOD PREPARATION AND STORAGE

### Acorns

Every group with sweet acorns available ate them. NT rated acorns most important wild crop. Leaching after pulverizing unknown. Reduction of tannin content by boiling in case of Zu, who stated nuts bitter if not boiled sufficiently; however, no change of water. Probably other groups that boiled (291) extracted tannin thereby; but not cognizant thereof. Oaks producing bitter acorns avoided in collecting nuts, WS, Me testing acorns to determine. According to native classification more than one kind eaten: ST 4, Me 3, Li 4, KP 2.

ST oaks in order of preference: Gambel's, Emory's, scrub, and another; 3d and 4th about equally third choice. SC avoided acorns of "blue" oak; ate raw (290) scrub-oak acorns (*Quercus arizonicus*), which cracked with teeth like pine nuts. Me 3 kinds of edible acorns. One, from scrub oak, grew near confluence of Pecos r. and Rio Grande, and near Alamogordo, New Mexico; acorns boiled. Of 4 kinds eaten by Li, one very large and globular. Ll, Ol ate no acorns because bitter. SA ate acorns from scrub oak. KP 2 species in Baboquivari mts., one with whitish trunk and large brown acorns; other reddish acorns. Both eaten raw; for old people, slightly broken on metate.

290. Me acorns raw in S part of range, whereas around Mescalero parched. HP ate raw, biting in half to extract kernel.

291. Zu boiled in hulls, cracked with teeth, peeled. SA boiled after shelling, or roasted whole in coals (289).

292. Me, Li parched in wooden bowl; Me also in basket. SA parched whole or shelled, in pottery bowl.

293. Shelled on metate by cracking hulls, not mashing kernels; winnowed. Me parched before shelling. Wa shelled by holding between fingers on anvil and striking with hammerstone; after shelling might parch slightly.

294-296. Grinding meal chiefly on metate, followed shelling and winnowing. Me mixed meal with mescal, Spanish bayonet fruit, but not meat. Me, Li sometimes ground in pit lined with rawhide. Li pulverized on flat rock with natural cobble pestle; mixed with Spanish bayonet and other dried fruits.

297. Ash-roasted acorn bread, without addition of red clay.

301. Basket storage. Burden basket (NT, ST, Ci, WM), pitched basket bottle (SC, Ci, WM, Hu).

WS objected to pitchy flavor imparted by latter. Ci sometimes stored kernels in unpitched, mud-plastered basket bottle. NT stored whole in burden basket covered with grass; kept 6 or 8 months. ST, SC stored whole or shelled. WM stored shelled, lest get wormy.

302. Pot storage. ST, whole or shelled, tied on cover of dry grass and yucca leaves, hid in rock crevice or hole in cliff. Zu after boiling; kept year. KP stored whole, pottery lid sealed with greasewood gum, cached in cave.

303. Skin-bag storage. Hu shelled, in cave or pit (stone-slab and grass lined). Me seldom stored, then whole in rawhide bag in house. Li stored shelled in rawhide bag. HP did not store, as became wormy.

#### Mesquite

Generally at lower elevations than oaks, furnished staple food highly prized for saccharine content and abundantly used by native groups to whom accessible. Mortar rather than metate was pulverizing device, and often bedrock mortars used where pods collected.

304, 305. Mortars. ST bedrock mortar, or stone-slab-lined pit with crevices mortared with damp pulverized pods to exclude dirt. (At Gila Pueblo, Globe, Arizona, an ancient pit mortar of this type preserved in museum.) KP bedrock mortar, or pit lined with buckskin; stone pestle for both; pods stored in large coiled baskets (474). HP some trees produced 2 crops of pods; sometimes picked by climbing men; 3 types of mortars: stone, wood, cloth-lined pit (in emergency only; no holes worn in cloth because sticky material filled interstices).

305. Mortar pit lined with rawhide (WS, Hu, Me, Li), lined with buckskin (KP). WS stone or wooden pestle; Hu, Me stone. Me gathered pods in burden basket or rawhide bag, from low trees, no beating necessary; sun-dried 2 days; after pulverizing, meal sifted through fine openwork twined basket which retained seeds, on rawhide; meal boiled in deer soup; sometimes piñon ground with mesquite; sometimes dried pods chewed for sweet juice, solid parts expectorated. WS mixed mesquite meal with black walnuts; KP with maize meal, boiled into mush.

306. WN boiled pods, ground into paste on metate, seeds as well as pulp; ate without expectorating any parts. Ground on same metate as maize.

307. NT, ST separate seeds by winnowing. KP sifted, seeds remaining in yucca-leaf twilled sifting basket; see note 305 for similar Me practice.

310. Mesquite flour dried into hard cake; kept about year; ditto screw-bean flour (314). WM made hole in center for rope to carry; caked flour pounded in pit mortar, boiled, eaten, or juice drunk.

312. Commonest chewing gum in SW piñon pitch (373); mesquite pitch perhaps second. SC children

chewed latter. WN chewed gum from small shrub (*Chrysothamnus*) used for house covering; another chewing gum was milky sap from low plant. SU chewing gum from root of shrub.

#### Screw Bean

WS, Me, Li obtained along Rio Grande, HP along Gila r. WS used juice for earache medicine as well as food. WS, Me, Li prepared like mesquite. HP cured in pit with earth for 4 days; pods turned brown; pulverized; whole pods stored in pots.

#### Mescal or Agave

Like sweet acorns and mesquite, eaten wherever available. Absence among certain groups in element list means not obtainable. Its use has given name to at least one group, the Mescalero, or, in their own tongue, Natchene (mescal people); it was probably their most important wild vegetable food, with Spanish bayonet fruit in second place. Eagerly sought in trade by many groups who lacked it in their habitat. Thus, Wa obtained theirs from Yavapai and Western Apache. Importance in native dietary further indicated by certain taboos observed in cooking (321-324). Cooking period 36 hours.

317. HP collected when new stalk appeared; no fire on top of earth oven wherein cooked.

318. Individual butts marked by owners, as cooked in communal oven. Women inserted sticks or leaves, or tied knots in projecting fibers of leaf bases, as marks.

319. Sometimes place in roasting pit marked; HP woman surrounded her mescal butts with stones. HP put red rag over oven to "aid right cooking."

320. Buffalo shoulder blade to shovel earth over mescal oven, Me, Li. Latter often used hands, heaping earth on piece of rawhide to carry to oven.

321, 322. Li variant of 321: first mescal butt cast into pit by summer-born person. ST women usually lit fire in roasting pit. As WM lit fire, prayed mescal would cook properly. WS young person lit fire. Me person not allowed to light fire on second occasion, if on first mescal had not cooked properly; man lit only if no woman to do so; lighter marked one butt with charcoal cross.

323. ST mescal white and underdone if sexual intercourse during cooking.

324. NT women used scratching stick 2 days while cooking mescal.

325. Besides pounding cooked mescal to express juice, KP boiled cooked peelings for syrup. Other foods mixed with mescal juice: pulverized walnuts (376); WS crushed sumac berries.

327, 328. Storage of dried pads. Hu, in parfleche. Li, in large folded rawhide bag similar to parfleche but without lacings. Me pads ca. 2 by 3 ft. KP, HP pads round, stored in pot in cave.

329. Mescal stalk above butt eaten when neither too old nor too young; bitter when very young.

330. After rain, mescal flowers emptied into basketry or pottery cup, fluid drunk. HP ocotillo flowers instead, in early morning.

### Yucca

In absence of botanical identification, data on various species are dependent on native description. Four types, probably embracing more than 4 species: (1) Spanish bayonet or amole, principal species for food and detergent; (2) narrow-leafed yucca, less desirable as food, used for basketry material and detergent; (3) sotol, apparently lacking in more elevated regions of Pueblo, Navaho, and SU habitats; (4) bear grass, apparently *Nolina*, which has flexible leaves. NT called (1) ikaye, (2) kayakose, (3) ikaptbane, (4) gokise.

331-336. Spanish bayonet. Very ripe fruit peeled, split, seeded with fingers, meat eaten fresh, or sun dried and stored; if not very ripe roasted in ashes, immersed in water, peeled, seeded, eaten, or dried and stored. Three groups did not cook fresh fruit: Zu, SI, HP. Fruit made into cake or brick for storage. SI, with only scant supply from mts., ate fresh, no storage; called pa a. Ol baked fruit in pot, stored to last winter. KP carried "bananas" in kioho carrying frame (1572), ripened green fruits under grass; preserved fruit boiled, sometimes with maize meal. WN mashed fruit on metate, made into brick, many perforations for air; stored in hide sack buried in juniper-bark-lined pit in cave; dried fruit cooked as mush. EN stored in baskets. WM ate dried fruit after soaking. WS, Hu used deer shoulder blade (952) with buckskin-wrapped handle to macerate fruit before drying. SU peeled, seeded, stored dried ripe fruit in buckskin bag. Wa seeded, dried, stored in pot with skin; dried fruit boiled to eat. Zu peeled, seeded, boiled, dried for storage; eaten during 4-day meat taboos in winter. SA boiled preserved fruit or chewed dry. HP allowed nearly ripe fruit to ripen till skin black; split open, seeded, dried with skins, stored in pot; dried fruit boiled, skins skimmed off.

334. Flower stalk eaten young. Boiled by Zu, SA; roasted by KP.

335. SU roasted flowers in coals, ate centers only; stalk not eaten.

336. Root stalk for soap. ST, Wa used leaves also.

337-340. Narrow-leafed yucca. Flowers boiled by groups who ate, except SU roasted in ashes.

338. Butt or "cabbage" cooked in earth oven by WS, Me, Li; by others in ashes. KP said Sand Papago cooked and ate.

339. Wa cooked fruit in earth oven; water added for steaming. Foliage over fruit, then earth; fire on top. Cooked overnight. Eaten at once, or dried.

340. HP pounded leaves for soap (possible not narrow-leafed yucca). Another yucca for soap only; no food, no basket material.

341-344. Sotol. Stalk eaten young. Butt roasted in earth oven by Me, Li; base of leaves eaten after cooking, not butt itself.

345-347. Bear grass. WS boiled flowers with meat and bones for soup. Fruit eaten by SC; seeds parched by WM. ST ate flowers and stalk. WS roasted butt in earth oven, pounded in rawhide mortar, winnowed out fibers, stored meal; fruit not eaten because bitter.

### Cacti

348-350. Pitahaya. Hu not clear whether pole for pitahaya similar to Papago (266) or to saguaro pole (267). Also collected fruits from horseback. Called mitaya (Apache rendering of Mexican name?). From region S of Huachuca mts. Eaten fresh, not preserved. Li described "pitahaya" as low-domed cactus, 4 varieties in habitat—probably not *Lemaireocereus thurberi*. HP sometimes stored naturally dried fruits. Pulp and seeds eaten like figs. No pitahaya in KP habitat, but collected in Papago neighbors' territory in Quijatao mts. and near Imika. 2 crops a year.

351-353. Saguaro (*Carnegie gigantea*) fruit most relished; for it considerable journeys made by mt. groups. Hu called nanadjaga, obtained N of habitat; ate fresh only. KP gathered in tight basket to prevent leakage of juice.

352. Cake of saguaro fruit similar to brick of figs; Ci, WM wrapped in willow bark for transport and cleanliness.

353. Seeds separated from dried pulp in water, sank to bottom; sun dried, parched, ground into meal; so greasy used to fry in same as lard (HP), a modern practice; also substitute for brains (1042) in skin dressing (HP). HP boiled fresh for wine, syrup, or jelly; seeds precipitated, dried, pulverized, eaten as pinole. Ci used saguaro boles (2 together) as containers for caked dried fruits; also to soak dried fruit in separating seeds, which basket parched after sun drying; sometimes pulverized with maize. KP ate ground seed dry as pinole, sometimes mixed with maize meal. All groups denied reclaiming seeds from feces; KP attributed to SE Yavapai of Superstition Mt. region; Russell (p. 71) attributes to Pima.

354-356. Prickly pears or tuna (*Opuntia*). Flesh eaten; seeds discarded in all but 3 groups (ST, Zu, SI). Number of kinds used: 1 by Ll, Ol, SU, Wa; 2 by NT, Zu, SA, SI; 3 by EN; 4 by SC, WS, Hu; 7 by Ci, Me, HP; 8 by WM; 9 by Li; 10 by KP.

354. WN fruit of low *Opuntia* in Cameron-Leupp region; EN to Cañon de Chelly for *Opuntia* fruits. Ol ate little because indigestion. Besides one species regularly eaten, SA ate sparingly of species with larger fruit which caused dizziness and headache. SI ate yellow and red fruits; if fresh, seeds spat out. HP boiled fruits of some

into syrup; if overate chills and headache for 2 or 3 hours.

355. WN singed spines, dried fruit. When used, boiled, seeds thrown away. NT made dried fruit into round, thick cake similar to cheese. Hu put dried fruit in water, drank, in winter. Zu pulverized dried fruit with parched maize. SI ground dried fruits, including seeds, on metate; meal boiled in water to mush. Of 10 species eaten by KP only one dried; if very ripe, peeled before drying, seeds removed, pulp made into brick; to serve, dried flesh pounded to meal, mixed with water, drunk. HP split and dried only one species, somewhat hard, not many seeds. ST ground *Opuntia* seeds, mixed with acorn meal.

356a. Cholla cactus. SA ate yellow fruit of fleshy, branchy cholla cactus; KP, HP ate another species. SA roasted in hot ashes to denude of stickers, then steamed in small pit, covered with damp earth, fire on top for hour or 2; caused fruit to swell; eaten, or dried and stored; later stewed with chili peppers, as sometimes was tuna fruit after seeding. KP picked green fruit of small cholla in spring, cooked overnight in earth oven covered with grass and earth. Some eaten, remainder dried and stored in pots. HP ate pulp of branches when buds just opening; singed stickers; boiled and ate flowers.

357-363. Other cacti. Large and small "barrel" cacti and probably species of *Mammillaria*. ST incidental in dietary.

358-359. WS ate fruit pulp of small "barrel" cactus, probably *Mammillaria*; seeds dried, parched, pulverized, eaten with mescal syrup or dried Spanish-bayonet fruit. Me ate figlike fruits of 4 species of small "barrel" cacti in S part of range; also dried for winter use. Ol poked off fruits with straight stick from small globose cactus which just protruded above ground; brushed with twigs; fruit very sweet, eaten raw, seeds discarded. Wa boiled, dried, stored fruit of small "barrel" cactus; also ate fresh, consuming seeds. Zu dried barrel-cactus fruit; pulverized with parched maize. SA singed spines from small "barrel"-cactus fruit.

360-363. Large barrel cactus with curved spines, called much by SU. See 406, 407. Zu only boiled buds, dried, stored. SU ate pulp of 2 low cylindrical cacti, of barrel type.

### Piñon

364. Li 3 kinds of edible piñon; pecans also, gathered from ground or with thrown stick.

365-366. Gathering piñon by thrashing branches with pole, climbing and striking cones with stick (Ol), shaking branches with hooked stick (Me). Me, SA roasted cones in coals to open and depitch. Wa in hot sand. SU pounded parched cones to extract seeds. Most groups ate kernels raw and parched, but SA complained of pitchy taste if raw.

369. EN parched nuts in coiled basket with coals; Wa, Zu, SI in pottery dish over fire. (Zu

used 10- or 12-stick stirrer, 917.) SI parched in Spanish oven, manipulating with wooden paddle. Li, SI on stone.

370. Hulled on metate after parching, to crack hulls only. Winnowing followed: WN hands and breath, or winnowing basket. Zu willow wicker winnowing basket (1634) in wind or with breath. Ll pot or basket. SU in basket. Piñon everywhere cracked individually with teeth. Li only used small hammerstone for hard-shelled variety; lacked metate.

371, 372. Paste of whole nuts with thin shells or of hulled nuts. WS mixed with Spanish-bayonet fruit, mescal, etc. Li alone made paste by pounding with stone on flat rock or rawhide; others used metate. SA mixed paste with warm water for gruel; given baby as milk substitute.

### Walnuts

375. After ridding of skin by pounding, nuts washed in basket in running stream by Ci, WM, WS, Hu; in wooden bowl or pot by Me, Li; in large tortoise shell by Li. WM sometimes shelled in bedrock mortar near ruin. WS on flat rock. KP cracked one at a time with hammerstone.

376. Also pulverized with Spanish-bayonet fruit, etc. (WS, Li).

### Wild Plums and Cherries

377-380. EN chokecherries and another sort; flesh only of latter eaten. Me 2 chokecherries; one "intoxicated" if ate too many. Li 4 wild plums. Ol also dried strawberries, raspberries, another white-flowered berry. Sun-dried chokecherries ground very fine. WS boiled plums and cherries in pot. SU chokecherry-meal cake for storage. No mixing chokecherries with pulverized meat.

Not in element list: (1) wild grapes, Li 4 kinds fresh or dried; (2) juniper berries, Ll boiled, Ol not eat, SU raw without grinding but tested trees for "sweet" berries; (3) wild gooseberries, Wa raw.

### "Grass," etc., Seeds

381. EN 6, pulled up or broken off, dried, threshed. ST several; one 15-18 in. high, seeds gray. Me 3: wild "sunflower," wild "spinach," wild Johnson grass. Li no seeds until learned from Tuetenene (intermediate Mescalero-Lipan group), then chialike plant called <sup>es</sup>tataslaye; seeds boiled without parching or grinding; has corms one above another, raw or cooked. Zu 3 by hand; no beater "lest scatter." Wa bunch grass, seeds brown, ground with maize; grama grass, *Bouteloua* (fide Alice Eastwood), stems picked by hand, beaten with stick in folded blanket, winnowed in basket, ground lightly on metate to rid husks.

383, 384. Knife for seed gathering. NT ash

wood for "sunflower" heads. ST hardwood, 6-8 in. long, single bladed, for "sunflower" heads only; by pressure, not sawing; stone knife (384) same purpose. Ci stone knife cut "sunflower" stalk foot long, sun dried to shake out seeds (386). SU foot-long juniper knife cut seed heads on wooden rim of hide carrying basket (288). Me iron knife sometimes for wild "spinach," which dried for shaking out seeds (386).

386. EN pulled up *Chenopodium* (fide Alice Eastwood) plants (Navaho, *toste*) by roots, dried, threshed with stick on blanket, rock, or hard ground; hulled tiny black seeds on metate, winnowed by pouring in wind; stored in deep pit into which one must not step lest sink and smother. ST tied "sunflower" stems in bundles, dried, shook out seeds. SC only dried plant tops over fire. SU parched cottontail-grass seed in pit with hot coals, stirring with stick; winnowed by pouring in wind. Other seeds parched on flat rock with coals, turned with 2 forked sticks 6 ft. long; hulled by treading with soft-soled buckskin moccasins; winnowed by pouring from coiled basket bowl. KP gathered certain seeds by bending plant heads over basket and beating with stick. HP red-seed plants pulled up by roots, seed heads rubbed in hands. Carried in coiled basket on head ring.

387. ST burned dry grass and brush to drive game and insure better crop.

#### Chia

388-396. NT called *nadiskit*. WS pulled up whole plant, dried, rubbed out seeds with hands; meal mixed with mescal syrup, etc. Hu boiled ground parched chia into mush. Ll broke off stalks, dried on rawhide, threshed with stick, ground on flat rock. Ol only wild seed used; carried and stored in buckskin sack.

#### Water Plants

397-400. Ci tule flower buds raw; pollen for ceremonial use collected on buckskin. Me children ate cattail flower buds. KP imported tule pollen from Sacaton Pima. HP only ate pollen from tule and (or) cattail blossoms.

400. Tule stem bases eaten by children, SC; boiled in soup or stew, WS; raw or cooked, Me. White basal cattail stem eaten, Li. Blue-flowered corm raw by Ci, "camas" raw by Ol.

#### Miscellaneous

401. Ironwood (*hotit kam*) seeds parched in basket by KP, in pottery dish by HP; no boiling or leaching.

402, 403. Greens. WN wild "spinach." EN bees-weed leaves, some dried for storage after boiling. ST greens boiled in pot. Me wild "spinach" and another plant. Ol sunflower-like plant when young, also plant with beanlike pod. Wa wild spin-

ach boiled, dried, stored. SI plant called *caliche*, also one with Spanish name "waco" boiled. Zu small-leaved water plant raw; 4 others boiled with fat. KP 3 boiled greens. HP 3 winter greens, 2 summer greens; also tree buds, roasted, peeled, white center "like coconut."

#### Liquids

404. Natural filter by ST when water muddy. KP cleared muddy water in pot by adding fine ashes which settled with suspended dirt.

405. Snow for drinking. HP travelers.

406. Water substitute from barrel cactus. Top cut off, pulp pounded with stone, clean sand put in, further pounding, finally clean clear fluid.

408. Fruit juices fresh. Saguaro and (or) tuna. Beverage of crushed sumac berries (SC, *sinkoye*) water added; except Li, crushing on metate. Li 7 varieties of sumac.

410. Saguaro juice boiled, fermented 2 days. Pita'a juice sometimes by HP, producing sweeter wine than saguaro.

412. WS alcoholic beverage by pounding cooked mescal on rawhide laid over edge of rawhide-lined pit to receive juice, which fermented in 4 or 5 days; no special ceremony at which drunk.

413. Me mesquite pods boiled and fermented in pot. HP added saguaro juice to boiling mesquite.

414. Sotol baked 1 day, by Me, juice squeezed into pot to ferment.

415. SC, WS, HP claimed maize wine as native. SC, WS sprouted maize in damp, straw-lined pit, mashed it, boiled it, placed in pot to ferment; called *tulpai*. WS boiled *Clematis* blossoms in decoction to increase potency. Me maize wine (*tiswin*) from Mexicans; wheat mixed with maize. HP put "certain white flower growing at Pisinimo," in wine of person not liked, so person got drunk quickly.

Maize wine introduced to EN by Apache; Ci by Mexican captives; WM, Me by Mexicans; Ol of maize obtained from Pueblos and Mexicans; Zu of black maize, invention attributed to Mexicans.

#### Condiments

416. Mineral salt. Me on ground in Guadalupe mts. (good quality), banks of Pecos r. (poor quality). Li from ground in rock shelters near Zaragosa, Coahuila. SU powder from ground in small caves; dissolved in wooden bowl, impurities poured off; water evaporated, salt residue.

417. Salt from stalactites. NT cave to N on Colorado r. ("red water"); nobody lived in region. ST cave on Salt r. near confluence of Cibecue creek; salt scraped into basket. SC cave on Black r. (ca. 5 days' round trip from Pinal mts.), another 12 mi. E of San Carlos. Ci cave near confluence of Salt r. and Carrizo creek; stalactites shot down with arrows; also reddish salt from cave floor; prayed to goddess *Istlanatlehe*, to her

son, and to "the one who made salt"; timbers in cave as of old ruin. WM same cave; men went, sometimes women too; prayed before start. WS scraped "crystals" in cave wall, in basket; pulverized at camp, moistened, formed cake over rawhide rope for carrying; many salt caves in San Francisco r. region. Salt cakes stored in caves with food. Hu scraped cave wall or stalactites; salt from small lake and by trade from Mexicans.

418. Before Zuni lake for salt, Wa cave in canyon of Colorado r.; man lowered with rope; rock salt, some reddish, some white; at home ground on metate. SA dug reddish salt from cliffs or caves where deposited by seeping water.

419. WN alkali "salt" from confluence of Little Colorado and Colorado r. ST from Little Colorado r., where crystallized on damp soil near water's edge; men and women on expedition; salt formed into cylindrical cake on stick, carried by yucca-fiber cords. WM salt crystallized on ground near salt spring (421) on Carrizo creek; cake around stick, which pulled out leaving hole for rope to carry; some Indians visited WM for salt by trade. Salt on ground at Gila Crossing not Papago, but Pima; all Papago salt from sea.

420. KP, HP only groups to sea (Gulf of California) for salt, yet ate no sea food. Apparently both to same place, described as lagoon reached only by highest tides and located opposite island (perhaps Montague); 8 days' round trip from Gila Bend, Arizona. KP 2d place for salt, in north, apparently in Cocopa (Ku'apa) country, rarely visited.

KP details: White cotton headbands worn, no red and white paint (Goddard, p. 138). Novice on salt trip fasted, eating pinole thrice a day and only what could be picked up in fingers at single attempt. Others did not fast. On horseback, round trip 8 days. All used scratching stick. On return novice sung over for 1 night at chief's house, then fasted 4 days away from village.

HP details: Old man directed. Pinole for food; 1 pinch at meal, in water. No paint on face. About 5 mi. from salt place is open flat. No turning back for anything dropped there, but one coming behind might catch on stick. Raced around lagoon and on gulf beach; if good runner there, good racer later. Must not tell what seen on trip. For 4 days after return ate only pinole, used scratching stick, camped away from village. After 4 days returned home. If not purified, smelled like ocean, developed cough, died. Salt given visitors.

421. Salt from spring only by WM; from spring and lake by SA; from lake only by others. Zuni salt lakes by various peoples for salt; not regarded as exclusive Zu property:

EN dressed in white; shaman not necessary; dipped salt with hands from under water; if not careful, bad luck ensued; salt stored in pot with flat stone lid, in rock shelter. WS from Zu salt lake; rock salt from bottom with digging-

stick; pulverized, made brick. Gift to man or woman who knew "water ceremony" to pray before start. Without this, water rough, might "swallow" wader, etc. Ceremony also at lake. Pollen given shaman, who entered water first. Only old men, women went. No prayer or ceremony for cave salt. Hu from lake only after praying; wore white buckskin. "Took without prayer and lake disappeared." No ritual for cave salt. Me occasionally from lakes near Tularosa, but oftener from salt pool nr. Ft. Quitman, Hudspeth co., Texas, where skimmed from water. Li rock salt from lake between Villa Acuna and Piedras Negras, Coahuila, not near Rio Grande. Ll lake "far to the east." Ol from Mexicans who got from salt lake "near Albuquerque." Rarely Ol went to Laguna del Perro, near Willard, New Mexico; removed from lake bottom with bare hands. Wa from Zu lake; no permission or payment to Zu. No white clothes; entered water naked. Zu men only for salt from War Gods' lake; priest accompanied; offerings at shrine. 2 maize ears in husk painted with black mud from lake bottom put with stored maize so "it will last long." SA, SI rock-salt lake bottom near Willard.

425-429. Ashes as seasoning. WN ashes from juniper leaves, sagebrush, or Chrysothamnus for bread. EN sagebrush, greasewood, bean-vine ashes. WS juniper-leaf ashes (also boiled saline plant with meat for seasoning). SU juniper-leaf ashes attributed to modern Navaho influence. Ol juniper-leaf ashes in maize-meal mush (maize imported). Wa juniper-leaf or sagebrush ashes. Zu maize-cob ashes; blue powder from white stone burned overnight with sheep manure for seasoning greens.

430. Wa white clay in paper bread. SA calcined lime rock.

431. Clay eaten with red berries by EN, SU, Wa; white clay with cooked wild tubers to prevent vomiting by WN, EN, Wa, Zu (also blue clay). KP ate red clay to stop bloody feces. HP pregnant women ate white silt after rain. ST goddess, Changing Woman, forbade eating clay or other "dirt" with crops she gave mankind.

434, 435. Rabbit manure as food. Wa tamale of white cornmeal, fat, salt, dung from intestine of rabbit. Zu with tuna to "prevent pimples on chest." HP only as medicine for baby whose sickness caused by father killing jack rabbit just before birth. Rabbit gut cooked after cleaning.

#### Generalities concerning Food Preparation

436-438. Kitchen outside house in summer. ST in shade; in winter in house or enclosure outside. SU in shade of tree. Wa in angle of walls outside.

439-442. Cooking meat.

439. Roasted in coals: WN deer, antelope, elk. Ci deer, coyote. WS mt. lion, wildcat.

440. Broiled on sharp stick, etc. Me on hot rocks leaned up around fire; also on bent green oak withes overhanging oak and juniper coals. Li on leaning sticks or stone; thus deer head against leaning rock.

441. Boiled. WN deer, antelope, elk. ST deer, antelope, rodents. Zu deer's head with ear of maize in mouth.

442. Meat cooked in earth oven by all except Ll, Ol. WN deer, antelope, elk. EN hot stones, earth over stones, prairie dogs, more earth, hot stones, earth, fire on top; porcupine cooked with layers of stones and earth on top of ground. NT wildcat meat covered with pine needles and earth; cooked 2 hours, no fire on top. ST coyote, wolf, wildcat on wet grass over hot stones, earth covering, cooked 2 hours; horse and cow heads. WS beef sometimes. Hu beef head, not deer or antelope head as spoil hunter's luck. Me bear's head, mt.-lion meat, beef roasts. Li heads of bear, buffalo. Wa rabbits, not deer. Zu deer, rabbit, porcupine, mt. lion. SA small mammals with either hot stones or hot ashes, fire on top; cooked overnight. KP mostly rabbit, also deer bones with little meat on them. HP deer's head with hot stones; jack rabbits without stones.

444. WN worked pot into earth, built fire around it. HP sometimes pot over hole in which fire.

446. Stone boiling in baskets by W Apache hunters to avoid heavy pots. At home in pots.

447. SU pottery scarce, poor grade which often broke when boiled in; not every family had; locally made, not imported. Hence, some boiling in stones with natural cavities, apparently not mortars.

448, 449. WS, HP sometimes parched in large tortoise shell. Me sometimes in wooden bowl. In pot parching, bowl usually over fire, food stirred to prevent burning. SI mixed coals with maize in pot over fire, stirred with 2 to 4 sticks together. HP parching bowl with "ear" handles.

450-459. Earth ovens. Ranged from huge coöperatively managed mescal ovens with hot stones to small pits without stones. Size governed by amount to be cooked. In Pueblos, Spanish domed ovens have largely displaced earth ovens. NT mescal cooking coöperative affair of several families; cooking wildcat meat (442), of one family. Earlier earth oven of SU was small pit with hot ashes; modern earth oven larger, without hot stones, Navaho type. Zu variant with coals in bottom, heated stone slabs around sides, for pot of maize pudding with saliva sweetening covered with stone slab, maize leaves, and earth; fire on top; 24 hours, still used in sheep camps. SI with hot stones for meats between two hides; layers of brush, grass, earth, and fire on top; cooked all night. More complicated earth oven with horizontal draft hole and vertical chimney used by Wa, Zu for steaming maize ears in husk, mostly sweet maize, for preservation. Wa moist sand over maize, no stones, but pit preheated all day. Pit 7 ft. deep, dug near edge of bank, so tunnel about 2 ft. above floor of pit ran to face of bank. Vertical chimney at back of oven plugged with maize foliage and earth. In opening oven, chim-

ney plug removed first; then oven cover. Cushing (p. 205) diagrams and describes for Zu. SA, SI in steam cooking maize in husks (582) poured water on hot stones. SA hole at side for introducing water, after which plugged and maize steamed overnight; dried and stored.

453. Besides mescal and maize few plants cooked in earth oven. WS pumpkin and squash. SU foot-long wild root which turns from white to yellow after cutting. SI pumpkin, squash. KP small cholla cactus fruit overnight; oven covering of grass and earth.

454. SI cooked fish in earth oven, split, sun dried, salted, stored in hide bag, pot, or basket, suspended in house. HP fish in earth oven without hot stones.

455. ST several families used single earth oven jointly only for mescal.

457, 458. Earth-oven cover other than standard grass or maize leaves. NT pine needles. SA cottonwood foliage. SI juniper bark. HP greasewood foliage.

459. Fire on top of earth oven (see note 450). Ci for green maize. KP for rabbits. HP for pumpkins.

460-462. Meat sliced and dried. Ll, Ol single pole on forked sticks, no fire. SU drying pole on bushes or between trees. Zu pounded sliced meat to hasten drying on pole supported by forked posts outdoors. SA on pole or rawhide rope, stored in buckskin or rawhide bag, which beaten with stick to soften meat. SI dried on bushes or on stretched 2-ply hide rope. KP dried on mescal ropes. HP on rope between posts and supported in middle with movable pole like clothesline.

462. Salting of drying meat to preserve, dubious aboriginal trait; but as seasoning probably bona fide. KP, HP maintained salt for preservation; other groups for flavoring only, not salt enough to require soaking before eating. After drying with salt, Ll, Ol packed meat in buckskin bag. Ol mt.-lion meat not dried. Zu dried salt-sprinkled meat, tied in bundles with yucca fibers, stored. SA salted for flavor dried flesh of domestic animals, not of wild game.

463. Small mammals dried after skinning and gutting. Wa cooked before drying. EN, SI, KP sun dried rabbit, etc., meat without cooking. KP sometimes cooked rabbits in earth oven preparatory to drying.

464. Ll split fish, dried on brush. WS cooked on coals, ate at once; no fish soup.

465. Small mammals pounded, especially for old people. SU pounded bones with some flesh attached on rock, cooked in ashes, ate as "sausage." Deer fetuses pounded, bones included; adult deer bones not. Zu small mammals with bones. EN, SI, HP removed bones before pounding (in rock depression, SI).

466. Pulverizing dried meat by pounding with cobble on rock or in small mortar, not by rubbing (muller and metate); Hu partial exception (pounded lightly on metate, then rubbed). EN not pound on metate lest break; cobble for pounder (WN, EN). Ll women pounded dried buffalo, deer, antelope meat with pestle. Ol deer, buffalo meat on flat rock with cobble, oftener in rawhide mortar. Zu

shallow, nearly rectangular basin, stone mortar about 1 ft. square, for meat pounding; pounder flat, muller-like pestle, also as muller to grind chili in same mortar, to mix with meat. Wa mortar, oval basin, shallow, shaped outside and inside; to pound dried meat with fat.

467. Fat mixed with pulverized dried meat, stored in skin bag (EN, SU, SA). Ol mixed salt and fat. Zu ate dry, moistened with water, or with melted deer suet. Other foods mixed; acorns (WS, Hu), honey (Me, no acorns), chili peppers (Zu); usually eaten dry. SC boiled with maize meal.

468-470. Breaking of bones for marrow universal, subsequent soup (468) not. NT pounded on flat stone (not metate), boiled for soup. ST sometimes pulverized ribs with vertebrae for soup. Ci boiled bones 4 or 5 times for soup; pounded vertebrae and other bones with mescal juice, ate without further cooking; marrow extracted first. KP cut up deer backbone, boiled for adherent meat.

469. Pulverizing of vertebrae. See 468. WM boiled deer backbone, pulverized on flat rock until mush. Ll dried pounded vertebrae, ate without cooking. Wa deer vertebrae too hard, but small mammal bones ground fine for food in small mortar after cooking.

470. Extracted marrow for food by all but HP. Wa ate cooked.

471. Blood, fat, etc., cooked in paunch. NT tied tightly and boiled. Ci boiled or roasted by fire. WS boiled after pinning edges with small sticks and tying all around. Li blood in deer paunch, not buffalo paunch, buffalo blood cooked separately; Ol no blood for food. SU paunch and sausages (472) in earth oven with hot coals (no stones). Wa boiled blood and fat in pot; tripe cut up, cooked separately, no paunch or intestine filling. Zu, SA boiled paunch and sausage (472). SA also cooked in ashes. SI, besides paunch cooking, boiled deer blood with maize meal as mush; ditto KP.

472. See 471. ST blood sausage with fat boiled, eaten at once. WS only beef or horse intestines for sausage. Me buffalo intestines, deer too small. SI cleaned deer intestines, boiled, ate, not sausage.

### Food Storage

Well developed in Southwest, especially by Pueblo groups which usually had entire year's supply of maize in storage. With wild foods, both plant and animal, similar foresight displayed as manifested by frequent references to food preservation in preceding pages. This section deals with storage devices for wild foods in particular.

473. Bird-nest-weave storage basket of arrowweed by HP, of other material by KP, on top modern-type house or ramada (479) for mesquite pods. None on top old-type house (see illustration, Goddard, p. 129). On ramada stored foods

soon to be used; covered with sticks and earth, so usually opened from side to extract contents.

474. Coiled storage baskets. NT 3-rod foundation with Martynia design, higher in proportion to diameter than Pima ones; top covered with grass; in rock shelter. KP, HP multiple-grass foundation with mesquite bark sewing (Goddard, p. 134); KP indoors on platform on 4-forked-post foundation 30 in. high, grain storage.

476. Ci twined storage basket so large woman inside to make.

477. Zu stored chiefly dried Opuntia fruit in huge wicker storage basket indoors; wicker cover.

478. Granary on platform in cave Ci, HP; sometimes cave KP. HP also small brush storehouse near dwelling.

481-487. Pit storage. Of special interest because Basket-Maker practice. With KP, HP not standard. WM pit where morning sun shone, to keep dry. Zu indoors or outdoors. HP sometimes in house, covered to leave no evidence; also at farm might bury pot of food. Some wild foods stored in pits: EN Chenopodium, SU wild "potatoes" after drying. Wa storage pits in pueblo. Cists in floor of storeroom or corner of living room; stone-slab lined, slab covered.

488. Skin bags for food storage. WN deer-hide sacks on ground in dry caves; in late times of horse, sheep, goat hide. EN dried muskmelon sometimes stored in skin sack in pit (490). WS on stick platform on rocks, or on 4 forked sticks in cave (491). Hu saddle-bag type. Ll rawhide bags carried, never pit-, cave-, or tree-stored. Ol buckskin sack for storage and transport of chia seed, also parfleche; never pit- or tree-stored. SU buckskin sack from hide of large male deer, shaped like modern burlap sack except tapered to narrow width at bottom, for seed storage and transport; stored on bed of juniper bark in cave, covered with juniper bark, stones, clay plastered over stones to seal. SA rawhide bag for dried meat shaped like modern burlap sack.

489. Parfleche. WS with encircling cords, dried venison.

490. Skin bag in pit. WS lined pit with brush to prevent contact with earth. Li stone-slab- and grass-lined pit with slab in bottom to prevent touching earth; in open, not in caves, for dried meat, Spanish-bayonet fruit; pit covered with grass, earth.

491. Cave platform. Me sotol-stalk platform tied with yucca leaves. Li rock platform.

492. Bag hung in cave. HP only. Zu, SA from beam in house to prevent rats. SA stored all food indoors. Ci sometimes piled seed on cave floor. Me sometimes unfired "pot" of clay and grass for seed.

493. Zu closed wall niche with deer hide or stone block.

494. WS cached mashed boiled wild "potatoes" in layers with grama grass on level rock surface; cave closed with stones. KP wild "potatoes" on house floor, used daily.

495. EN dried wild "potatoes," dried maize

bread, etc., in pots. Wa sealed pot with sherd and clay; if crack developed, more clay. SA huge pots for grain storage in pueblo, cover wood or stone slab; if long storage, sealed with clay and grass (500).

496. ST pot in grass-lined pit, stone slab and earth over top.

497. Caches in rock shelters. WM pots of wild seeds, inspected periodically. WS empty pots in mts. Zu in rock shelter pending removal to Zuni. SI in caves and rock holes in mesas W of San Ildefonso; concealed with rocks and brush, often left all winter. KP blocked cave with stones. HP rock shelters for pots of food if living near hills.

498. Lids for food storage pots. WN another pot. ST, NT, SU stone slab. Wa note 495. SA wood or stone slab, or clay and grass plug. SI pottery cover. HP seed pot with sherd sealed by clay or greasewood gum, sometimes rag added to make tighter.

501. Food storage on tree platform. WS, Hu cached in trees where no caves; platform of branches in forks, sacks of food on grass and rawhide, covered with same, tied with yucca-leaf cords. SI sometimes in summer.

#### AGRICULTURE

502-506. Distribution in each group. With years of government aid, it is difficult to determine the precise extent of aboriginal agriculture in each group. Elements 502-506 summarize results of inquiry. WM farmer, haidmas; not derived from natak, maize. SC farmer nebinix (land owner), nonfarmer biniawuti (land without); keyar (ground), nebidacher (farm land).

502. All families farmed. Zu family fields 3 or 4 acres, chiefly maize.

503. All who could farmed. 2 factors prevented certain families from farming: (1) shortage of suitable land; (2) shortage of seed. Shortage of land: SC. Shortage of seed: EN, NT, Ci, WM. SC farm land enough for about half of population; chiefly in Wheatfields valley, near Miami, Arizona. Ci rich men had farms, majority none. Today 3 or 4 times as many farms as formerly. WM "1 in 12" families had farms formerly, now virtually every family.

504. Only some families who could farm did so. This element would seem to isolate those groups among whom hunting-and-gathering life still held strong appeal as against farming. ST "too much work." WS "too lazy" or no seed. HP some families preferred getting farm products from Pima; cut wheat for Pima, paid in agricultural products (537).

505. Exceptional families farmed. SU without farms depended on hunting and gathering, did not steal from farmers; however, people with farms did not go far in growing season.

506. Nonfarming groups. These 4 groups got agricultural products by trade or theft. Hu maize by trade from Apache 3 or 4 days' journey to E and NE, also from Mexicans. Li from Mexicans

by trade, gift, payment for work. Eastern Lipan (Chishene) farmed a little. Tuetenene (intermediate Lipan-Mescalero) farmed a little along Rio Grande. Ll maize from Mexicans and Pueblos for baskets, hides, porcupine-quill embroidery, etc. Ol now farm. Canjilon, E of reservation, one of earliest modern farming sites. In earlier times farm products from Mexicans for baskets and pottery.

507, 508. Farming without and with irrigation. EN land flooded if possible by digging ditch across with handled hoe of horse shoulder blade. ST farmed on little flats sometimes, without irrigation. SC "to irrigate," tichoninanochi. Ci planted after rain. Wa some farms got rain, so no complete failure of maize crop; shared if necessary. Zu not irrigate hillside plantings. Irrigation particularly at Nutria and Ojo Caliente, springs converted into reservoirs by walls. Formerly complete dependence on rains for farms around Zuni. SA garden plots with peppers and wheat irrigated from small stream; also maize patches in Jemez Creek bottom lands had ditch from creek. Middle June, water gone, depended on rain thereafter. SI maize planted 6 in. deep when rain only, 12 in. deep where irrigation from Pojoaque r. near San Ildefonso, from Rio Grande for W side cultivation. HP no irrigation from Gila bend S to Kaka.

509, 510. Ditches and dams. ST dammed creek with rocks, earth carried in burden baskets. SI Pojoaque r. and Rio Grande with timbers and rocks, sometimes completely across if narrow, otherwise projecting pier to divert water to ditch. In closing sluice, EN stood on edge of deer hide and threw earth against downstream side.

511. Zu, SI women watered small gardens with pot carried on head. Zu gardens of chili and onion, believed aboriginal (669, 670).

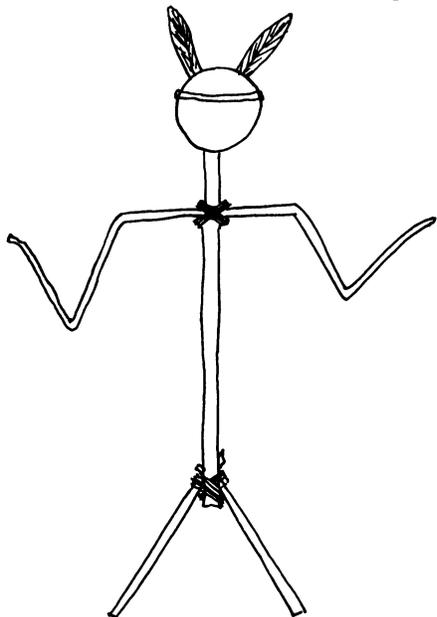
513. Wing fences to concentrate rain flow. Zu of cottonwood. SI not, because muddy water bad for plants. KP brush check dams in arroyos to limit water reaching field at one time. HP removed wing fences if flood, so water would spread over field and not wash it out.

517-521. Sites and soil. No doubt topography, precipitation, irrigation, exposure, etc., account in large measure for varying statements as to best farm land. WN levelness and sandiness, together with sufficient rainfall, requisites for successful maize growing; well drained sandy, not soggy, soil was best. Wa preferred slight sandy slope; sandy soil admitted rain water to roots quickly; sometimes planted in grayish soil (not really black as entered in element list); never in red soil because cracked open and allowed underground moisture to evaporate. HP soil must not be too sandy on account of drying too quickly; their ideal was loose soft soil with some sand. Zu planted in various soils: sandy and heavy red soils near Zuni, heavy black soil at Nutria. NT, SC heavy black soil best. WM, WS no preference so long as bottom land near stream. Planting to one side of arroyo mouth, rather than directly in mouth where flood danger, was practice. SU avoided arroyo mouths in

favor of level places where rain water soaked in. Wa, SA, SI planted to side of small arroyo mouth where silt accumulated; SI regarded as good for maize and watermelons. HP arroyo mouth or base of mt. good farm site on account of accumulated soil and seepage from slopes; such land usually fairly clear of natural growth. No crop rotation. Zu thought regular and steady cultivation obviated necessity.

522-536. Sex labor. WN also children cultivated; brush hut for person guarding maize field. EN fence of Spanish bayonet yucca to keep out coyotes. NT, Ci, WS weeded by hand, no tool. ST work subsequent to harvest by women; old people guarded growing crops. SC one made holes, second dropped seeds, third covered holes; squatted when digging; weeds pulled by hand. Ci no pests to frighten from growing crop. WM weeded with digging-stick when maize small; when taller, weeds crushed down, because ground dried out if pulled; camped near when maize maturing, to keep off rabbits, coyotes, bears; fire of 2 oak sticks or other hardwood to frighten. WS soaked seed maize overnight before planting. Children helped in farm work. Family might move away after planting, because scarcity of wild products; returned occasionally to inspect. Sometimes bear or other mammal raided garden, but crow worst. Me, SU weeding by hand, no tool. HP women sometimes weeded by hand.

532. Scarecrows. EN crowskin on pole. SC human effigy of weeds and sticks about man's height (see fig.). WS cross of wood with old garments. Me of wood, yucca leaves, sage hat; be-



lieved aboriginal. Wa human effigy. Zu of old clothes and maize husks, arrow in hand. SA cross of wood and old clothes. KP grass on sticks, forked for legs; wrapping of Spanish bayonet and narrow-leaved yucca leaves.

537-539. Hired and reciprocal farm labor. Indubitable hiring limited to Athabascan groups,

perhaps among Papago too; at least HP hired out to Pima farmers, perhaps modern practice. Athabascan (especially Apache) hiring appears to be ancient and probably explainable on basis of division of population into farmers and nonfarmers. However, farmers as well as nonfarmers hunted, so former had no dearth of products of chase and gathering. Nonfarmers, however, lacked agricultural products which they got as return for their labors on farms of their well-to-do fellow tribesmen. Statements of informants follow:

EN hired people without farms and paid in produce; reciprocal help among farmers on one another's farms. ST paid in food, maize-meal mush, venison. Hired especially for weeding. No reciprocal help among farmers. SC farmers reciprocated services at times, but mostly hired nonfarmers, whom paid in produce at harvest. If nonfarmer seized farmer's idle land and planted it, could not be ousted, but must pay farmer half of crop; this partial usufruct rarely exercised. With matrilocal residence, at times a man worked on his parents-in-law's farm. Family garden plots usually together, so siblings often had adjoining tracts and helped one another; if one away, another might tend his crops. Ci hired women only for harvesting, men busy deer hunting. WM poor begged maize from farmers. Others without farms worked for farmers, paid in produce; e.g., nonfarmer woman helped farmer's wife shell maize, received some as pay. Payment also in mescal and other foods, but not baskets or buckskins. Payment at time of service, not deferred. Women only hired; naturally poorest sought employment most. WS farmers helped one another, presents of maize at harvest time. Informant insisted reciprocity, not hiring. Me nonfarmers sometimes helped farmers, paid in produce.

Reciprocal help, not hiring, characteristic of 4 Pueblo groups. Wa farmer killed sheep, womenfolk made cornbread to feast helpers. When Zu farmer needed help, his wife or other woman of household went in evening to arrange it. Some distinction apparently of rich and poor, but even rich man helped poor man when called. Women of helper's family moved near field to cook, dividing labor as usual (one grinding, one making paper bread, etc.). Help asked especially at planting, when 3 men worked together, one making holes, one dropping seeds, one covering. Helpers not paid, but thanked and wished would live to old age. Farmer's wife presented food to women of helper's family. Farmer reciprocated later by becoming helper. SI relatives helped each other harvest. KP farmer paid helpers, though reciprocity rule. HP farmer fed helpers saguaro, etc.

#### Tools

540. Digging-stick ranged from 2 1/2 to 5 ft. in length. EN 4, ST 4, SU 3, Wa 5, Zu 4, SA 3-5, SI 3, KP 3 1/2, HP 5. ST mt. mahogany, plunged 2-handed into earth. Ci drove with cobble, prized up. Zu sat, soil scratched, perforated;

seeds dropped, covered. SA with footrest for tilling; straight for planter. SI oak planter with footrest, blade fire hardened. When earth to be removed, WN used pottery dish.

545. KP spatula weeder ("weaving-sword type") to break down weeds about foot high.

547. WN, EN weeder of shoulder blade of horse or other animal, wooden handle like shovel, to cut weeds at base. SA, SI, KP made similar tool entirely of wood (KP, of ironwood).

548. HP iron hoe.

550. Zu piñon-wood hoe; handle at right angle to blade, in perforation in blade with pitch and hide lashings; farming, digging wild bulbs or corms.

551. ST digging stick as weeder, someone followed to shake earth from roots.

### Maize

552. 1 to 3 color varieties. SC blue tall, red short. WM blue, red, yellow. Me white. SU white.

553. 4 to 7 color varieties. WN 6. EN white, yellow, blue, black, red, roan, spotted, striped yellow-red; spotted corn soft, called turkey corn because turkeys like. NT white, red, blue, black, yellow. ST blue, red, black or dark red, yellow, 2d red, spotted, white hard and disliked; planted separately. Ci blue, yellow, white, gray (556); no red maize which disliked. WS white, yellow, blue, red, mixed. Wa blue, dark red, yellow, white, pink, spotted. Zu yellow, blue, red, white, black, spotted, 2d spotted called "eagle maize." SA white tall, blue short, purple in dark and light shades, spotted, red and yellow modern. SI black, white, red, blue, yellow. KP white, blue, yellow, red, mixed red-white.

554. SI sweet maize: gray, brown, red, yellow, white.

555. SI popcorn white, differed from white man's.

556. Ci soft corn from Zuni; 4 or 5 Ci men got for mescal.

557. KP, HP sometimes grew 2 crops. KP in March in sandy soil near arroyo; in July-August in light soil, not necessarily sandy. First harvested May, 2d October. HP, lower elevation, planted January, June. In early planting both dug to moisture (4 or 5 in.), 3 grains in hole. KP, in March planting, first dug pit 15 in. deep, 15 in. diameter, to reach moisture and protect from late frost; after planting, floor of pit covered with inch of sand; as plants grew, pit gradually filled with earth. Soil around August maize as grew, not in pit; August planting different place, same varieties.

558. Depth of summer plantings. Holes to moisture, in inches: WN, ST, Ci 8; EN, NT, WS, Zu 4; SC 12; WM, KP 10; Me 5; SU 6; Wa 5-12; SA 6-15; SI 6-12; KP 2. WS planted in May, seeds rotted if too deep. After digging to moisture, Wa half filled hole with moist earth, then

placed kernels, so "would grow quicker"; 12 kernels if cut-worms, 7 if none. Zu depth of 4 finger widths.

Zu planting when sun rose between 2 mountains in May, determined by sun priest (1935) in Zuni from white stone on stone platform. Stone formerly at Pescado where earlier priest resided. Moved to Zuni in informant's time. Stone on low platform so priest can look over E house tops. Sun priest prays there every morning, in winter urging sun to "hurry and warm up."

In nonirrigated plantings, SA dug to moisture, 6-15 in.; in bottom lands (irrigated) depth 12 in. SI planted in April.

560. Number of kernels in hole. WN 8; EN, WS 4-5; NT, KP 3; ST, SC, SU 3-5; Ci, WM 5-6; Me, HP 3-4; Wa 7-12; Zu 6-8; SA 4-7; SI 2-4; KP, HP 3. SA 4-5 white, 5-7 colored.

Distance apart, in feet. WN, NT, ST, SC, Ci, SU, KP, HP 3; EN, WM, SI 4; WS 2 1/2; Me 2; Wa 15; Zu 5; SA 6-10. NT one stride apart; SA 2 strides (informant little man) apart for irrigated maize, 10 ft. for nonirrigated.

563. Planted during waxing or full moon. WN, SC, Wa moon nothing to do with planting. At full moon by ST only in month dzi'tbe'ize (April). SC when mesquite bloomed (June). Wa sun indicator of time to plant.

564. Height of stalk, in feet. WN, NT 6; EN 3-6; ST, Ci 4; SC, Zu 4-7; WM 4-6; WS, Me 5; SU, KP 3; Wa 3 1/2-8; SA 7-8; SI 5-10. Wa with good rains maize grew taller than man; if scant rain to 3 1/2 ft. SI stalk "dependent on soil."

Number of ears per stalk. WN, NT, SC, WM 2-3; EN 3-4; ST, Zu 2-4; Ci 2; WS 3-5; Me, KP 1-2; SU 3; Wa 4; SA 4-6; SI 1-4.

Windbreak. Zu dry stalks for new plants. Wa individual, of brush, for maize in small garden, not for large fields.

565. Maize ears dried in "braids," hung up. NT, ST draped over poles, ST between trees. Ci tied in pairs, stored in pit (570), usually on hill slope. WM tied double bunches of 6 or 8 ears each, on juniper branches to dry. SU ate maize green, saving 2 ears for seed. Wa bored base of cob with awl for "braiding"; seed maize from other's fields in braids on walls; steamed husked maize hung to dry. SA sometimes husked green maize, parched on coals (567), braided, hung; seed maize always braided, hung. KP braided extra large ears, hung for display.

566. Maize dried on roof or platform. Top of shade, WN, NT, WS, Wa (roasted maize temporarily), KP, HP. Me platform of willow 4 ft. high; stalks with ears. HP sometimes dried on platform as well as roof. Ci sometimes dried on ground. SA dried, husked in fields, shelled in pueblo. ST ate no dried maize till winter; in summer lived on wild crops as ripened.

568. KP shelled maize in basket granaries in caves. Only frost-bitten maize stored on cob, ground cob as well as kernel for food; usually eaten first.

569. Me kept maize in hut, as rapidly eaten by family, relatives, friends. As family moved, carried in skin saddle-bag horseback or afoot. SA maize, pumpkins, melons, etc., in lower-story back rooms; low wooden platforms, maize in tiers.
570. Maize storage in pits. WN not in sack. EN shelled maize in unlined pit; covered with brush, old blanket, etc., earth; kept all winter. Pit bottle shaped, bottom diameter length of man with arms stretched above head. WM pit in sunny location.
571. Maize in rock shelters. NT in baskets. Zu pending removal to Zuni.
574. Maize shelling by beating with stick. ST on blanket, women, kernels remaining on cob pressed off with thumb (575). Wa shelled short ears, difficult to hand shell.
575. Hand shelling usually with maize cob, stick, stone. WM rubbed two dried ears together, or used a stick. SI used cob or stone.
576. Awl-like implement to start shelling maize ear; shoved along suture between rows of kernels to force out kernels of first 2 rows at least. EN, SA hardwood "awl." NT "awl" of deer cannon bone. Ci antler "awl," forced out kernels in 3 places, then shelled with thumb or cob. WM bone "awl" on slightly green maize, for first 2 rows of kernels, then shelling with stick. WS bone or antler "awl"; 2 or 3 men did, passing to others to remove kernels by hand or cob.
580. Cooking maize. Wa husked green maize on cob in earth oven; covered with maize foliage and earth, fire on top; for greater part of day.
581. WM, WS roasted green maize in husks, peeled, ate at once. SU green maize in husks in small pit with hot coals; covered with ashes, earth, fire on top. KP green maize in husks in fire; peeled, dried, stored.
582. See note 450, earth oven for steaming green maize in husks, especially if frost threatened, preliminary to drying, storing. EN, SC, steaming followed by drying, shelling, storing; boiled later, tasted like green maize; steaming by one family, not cooperative affair. WM, WS shelled before drying. Woman's motive often desire to finish maize to go with others for acorns. This occurred when I was with WM; but departure premature, as few oaks had ripe acorns. Wa hung up after husking; shelled in winter to eat; boiled and eaten like fresh maize. Zu earth oven, stone-slab walled, preheated 2 days, no stones in bottom; cooked 1 night; maize taken home, spread on roof; tied husks together, hung over poles to dry further.
584. Maize parched before grinding. EN on hot stone, or overnight in pit with hot ashes. Wa, Zu, SA, KP in pot with hot sand. Zu in pot without hot sand, in pit with rabbit-manure fuel. SI in pot with hot coals, over fire, stirred with 2- to 4-stick stirrer; now in Spanish oven.
585. Parched maize ground and eaten without further cooking, as pinole. WN only pinole eaten. Wa ate with salt; pinole also of dried boiled maize, parched, ground. KP maize pinole.
- 586-588. Maize boiled with lime or ash. Eaten at once, it was obviously hominy as in SE culture area. Almost equally often treatment was preliminary to drying and subsequent grinding. Yucca-leaf ash, WS, Hu, Me, Li. Cottonwood-bark ash, WS. Oak-bark ash, Me. Juniper ash, Me, Li, Wa, Zu. Sagebrush ash, Wa. Any ashes, KP, HP. Calcined lime rock, SA, SI, HP. Pot boiling with ash or lime caused skin to peel off kernels readily; WS washed repeatedly in cold water to clean off skin particles. Me peeled after letting stand 1 night. SA peeled on metate with light sliding pressure of muller. SI peeled on metate with hand; mashed moist kernels on metate for tortillas. Some dried, kernels ground when used.
589. No treatment of maize before grinding. Wa for flour. Zu white meal for ceremonial use; red and yellow meal cooked in earth oven. KP meal or flour.
591. Ci, WM ground piñon nuts with maize, ate dry as pinole.
592. Maize kernels boiled with beans. Wa only hominy. KP teparies. HP hominy with tenaries.
594. Maize-meal mush. SC green maize mixed with acorns. Wa unparched maize meal boiled an hour, eaten with boiled meat.
597. Chewed meal mixed with maize batter for "sweetening" breadstuff. WN under American influence substitute sprouted wheat, pulverized and dried, to make "leavened" bread. ST regarded saliva use as "dirty" practice. Wa denied practice, but now use "sugar" from sprouted wheat, ground and dried, for sweetening anything. Zu used saliva "sweetening" like Navaho; sprouted wheat modern substitute.
598. Stiff maize mush wrapped in husks and boiled as tamale. SC green maize mush. KP whole beans or dried pumpkin in maize batter.
600. Dumplings of maize meal. EN green maize. WM dry maize soaked overnight before grinding, for dumplings. WS maize-flour dumplings went to pieces in boiling; wheat flour better. Wa white or blue maize flour. SA thick maize mush in round balls as dumplings in stew.
601. EN maize batter, saliva sweetened, cooked on maize foliage in preheated stoneless pit. Poured over gourd cup in center to run in different directions. Several families combined. Head woman made maize-meal cross, prayed for future crops. Then covered cake with maize foliage, damp earth, hot coals, wood chips, ashes, fire on top.
602. Pudding in covered pot in earth oven. Zu saliva sweetened, in pot lined with maize husks; buried in earth oven. SA maize meal mixed with pulverized sprouted maize cooked all night in earth oven; like jelly in morning.
604. SA dough of pulverized sprouted maize kernels in husks (tamales) in Spanish domed oven.
605. KP mashed green maize wrapped in husks, in hot ashes.
608. EN unleavened bread (nes'an) baked in hot ashes. SI on cleaned hot floor of fireplace. KP in coals, or shallow pottery dish.
609. Ashes added to maize-bread batter. Ci

juniper foliage or yucca leaves. SA calcined lime.

610. Zu saliva sweetened batter of blue maize meal poured on hot stone slab, another hot slab added, more batter, and so on; cooked all night. Cf. Cushing, p. 255, pl. 11c.

611. EN juniper-foliage ash in paper-bread (testi) batter. Wa sagebrush ash in blue paper bread (piki). Zu blue mineral ash (see note 425) in blue paper bread to deepen color.

612. Colors of paper bread. EN goat's milk now used with red maize flour for red paper bread; "without goat's milk red maize makes white paper bread"; black paper bread from wild seeds only. Wa blue, white, yellow, bright yellow, pink, red; white made of green maize. Zu blue, red, white, yellow. SA blue, white, red; for red, ground chili and red salt added. SI black, red, yellow, white.

### Beans

613. Frijoles. WN nakosi. EN from "Spaniards." NT pesot. SC besul; white and black spotted bean; planted end of July; blooms over long period. Ci be'esus. WM besol. WS ekas ute. Me beskans ute. Wa mole; also bean called hatiko, which interpreter called "lima bean," some spotted, some yellow. Zu noe. SA ganam. SI tewatu, about 1 ft. high; from Mexicans. KP mui. HP mun; 3 colors.

614. Varieties of frijoles. WN chix, red; disin, black; tako, white; bak, gray; chixgish, spotted; chisto, yellow; disizhin, dark red. ST yellow spotted, red spotted, black spotted. Ci pink, spotted white-black-yellow. WM pink, spotted, black. Me red, spotted white-red. Zu yellow, blue, red, white, black, spotted. SA pink, yellow, spotted black-white.

615. WS only sticks for frijole vines. ST grew in maize patch; SI sometimes.

616. WN beans on blanket to thresh with stick. ST on Navaho blanket. WS, Me on rawhide.

617. WN, WS stored beans in hide bag after threshing. Me carried in rawhide bag, not stored in cave. Wa stored in cotton sacks made from bride's wedding robe. SA in white woollen sack, 1569. SI in bag of soft buffalo rawhide, like burlap sack, hung from beam in house.

618. Ci frijoles in pot in pit. Zu in pots and, if short, in pumpkin shells in wall niche.

619. ST frijoles in burden basket or pitched basketry bottle. SC in old basketry bottles in pit. Ci said pit storage would rot beans.

621. Green bean pods eaten whole. Wa bapbü, Zu tapiya (to hang up); suspended in bundles to dry for winter, when boiled. SI boiled whole pods with meat.

623. Wa, Zu broke up frijoles (hatiko, see note 613) to speed boiling; never parched.

625. Wa small bean called mozi perhaps tepary; white (hochacha, white small) and black (komap chacha, black small). SA tepary (identified by Prof. G. W. Hendry) called

sih<sup>a</sup>rum; white in color, planted in April, ripe (dry) in September, while frijole (ganam) planted in July, ripe (dry) in October. SI large bean pogon, claimed aboriginal, probably Wa hatiko ("lima" bean, note 613), for SI informant saw pogon growing in Hopi country. SI pogon one red-flowered, other white-flowered; grows 2 ft. high. KP teparies pauf; aboriginal bean. HP baf; white, tan.

627. KP only grew teparies in maize patch sometimes. HP planted 15 days after summer maize; if sooner vines too long and did not bear well; late planting gave better yield; dependent on summer rains.

628. HP pulled up whole plants, kept upright lest pods open and scatter seeds before threshing.

629. Wa stored mozi bean in pot. KP teparies in pot in cave. HP in pot for long-period storage, in sack for daily use.

631. Black-eyed bean or cowpea. KP osipauf, 4 varieties, believed aboriginal. HP huwatauwufkam, 1.

### Pumpkins and Squashes

633. WN nayisa; color varieties green, gray, black, red, yellow, white, spotted red-white, striped; I think these terms describe color range for 1 or possibly 2 kinds, rather than separate varieties, for EN reported only 1 kind. EN pumpkin green striped, not ribbed. NT crook necked, striped green and white, ripened in August as did maize. ST crook necked only type grown. SC yellow, crook necked; called bekun; planted same time as maize. Ci crook necked only type, from whites; ripen in Sept. WS ripened in September. Me orange smooth; green striped, shaped like watermelon; orange ribbed; ripened Sept.-Oct. Wa batna; homi batna, crook-necked squash; hopi batna, "black" stripes on gray; machi batna, gray pumpkin; last 2 smooth surfaced. Zu green with black stripes, some smooth, some ribbed; squash with globose "body" and smaller globose "head," green with yellow stripes. SA varied from yellow to pale green with dark green stripes, smooth to warty surfaced; some double bodies like hourglass; planted end of April, ripened Sept. SI slightly ribbed, orange, yellow, white, green, blotchy brown. KP ha'a with soft-shelled seeds; yimki with hard-shelled seeds, hard rind, thick flesh; yellow to green, some striped; surface smooth to ribbed; globose to crook neck. HP ha'a, plain pale green or orange, sometimes slightly streaked with whitish, or whitish streaked with dark green; nyumpi, crook neck (638), almost "black," ribbed, smooth, very thick skin; da'kas, ribbed, wide longitudinal dark green stripes on greenish white ground color.

635. Introduced pumpkins at Wa orange ribbed, pink, or "black."

641. HP no pumpkins in maize fields lest vines grow up stalks.

643. Pumpkin dried in long spiral strips. NT kept about 2 months. ST not stored, as eaten daily. WS, Me tied in folded bundles. Wa peeled, halved, spirally cut, hung outdoors to dry; bundled, tied with yucca-leaf fibers and hung for further drying; some small pumpkins not fully ripe sliced and dried with seeds. Zu peeled, dried till sticky, cut spirally, hung to dry; strips tied in bundles, dried further; unripe pumpkins threatened by frost warmed with fire of weeds and brush to hasten ripening, then treated as above. SA ripening hastened as by Zu, peeled except for small strips of skin, cut in long spirals, dried on poles; strips folded and tied for storage; bundles hung for further drying, cooked any fashion.

644-647. Pumpkin storage. EN whole pumpkins sometimes cave stored till spring; dried pumpkin strips in rock shelter with juniper-bark covering. Ci ate when ripe, no storage. Wa sometimes stored unripe whole. SA whole stored on wooden platform in room. KP sometimes hung up crook-necked pumpkins. HP stored on grass in house, no cover.

648-649. Pumpkin cooking. In earth oven: WS, Zu, SI, HP. Zu covered hot coals in pit with sand, put pumpkins in, covered with sand, built fire on top; also baked in Spanish oven or roasted in open fire. HP pumpkins only food for which built fire on top of earth oven; fry pumpkin petals when they fall.

650-654. Pumpkin seeds. SI not eaten.

651. Parching. EN in old pot. Wa seeds of black-striped gray pumpkin only. Zu with juniper-wood ashes, salt, water; eaten with maize-meal mush; if more than 1 seed eaten at time, tooth will grow out like tusk; shells as well as kernels eaten. HP in pottery basin, stirred with single stick.

652. Grinding. EN on metate into meal like rolled oats. Zu bread of pumpkin seeds and maize ground together.

654. Pumpkin-seed kernels as cosmetic. Ci when chapping, also deer fat. KP no pumpkin seed for chapping or as paint base. HP cleaned dirt from hands, greased face as well as cleaned.

#### Various

655-657. Muskmelons. 5 stated aboriginal; 5 from Mexicans (see element 655). Wa 3 kinds: white, green, cantaloupe-like. Zu cantaloupe modern, others ancient; muskmelon cut in strips, dried on dead branches; stored hanging on poles indoors. SA dried muskmelon on poles; boiled to eat. SI long yellow muskmelon ancient type.

658-660. Watermelons. WN black, gray, white, striped; seed colors pink, black, white. EN, WS from "Spaniards." WS seeds black, white, red; no distinction as to varieties. Wa 4: (a) globular, white with greenish-gray stripes, red seeds; (b) "moonlight colored," pink seeds with black spots named for girls' hair whorls; (c) green

with white stripes; (d) very small "gray" melon with white stripes, pink seeds. Zu 1 kind with black, brown, or pink seeds; "yellow" flesh; thought aboriginal. SA, SI 1 kind with black, red, or white seeds. SI boiled flesh till consistency of molasses, for syrup on tortillas. KP 3: black, red, gray seeded; pit storage for watermelons only, covered with earth; no lining to pit, which circular, about 5 ft. deep, vertical walled; melons kept 2 months. HP 3 varieties on skin color, not seed color: white, "black," striped.

661-663. Gourds by trade from Mexicans (Hu, Ol). ST grew large ones for water bottles, too big to carry on journey. Zu man carried gourd canteen to field. Ci gourd cup, not basket cup. SA gourd spoons and dippers.

664. Cotton growing. Zu got from Hopi, except small quantity grown in chili patches. SA grew for weaving.

665. Sunflowers. NT seeds from Hopi. NT, ST grew and ate. Parched, hulled on metate, winnowed, kernels ground to paste, eaten. SC sunflower seeds from Mexicans. Wa seeds to dye cotton and wool navy blue; sometimes eaten.

667. Wheat. SC from Mexicans. Ci, Zu thought aboriginal. Zu little used. SI planted in March. HP planted at Christmas; garavance at same time.

668-671. Some other introduced plants. WS sweet potato, chili. Li collected wild chili, ate with meat. Wa ground chili on metate. KP ate wild chili, different from cultivated; also wild "onions." Wa dried peaches in pots. Zu peaches from Spaniards; 2 or 3 trees to family. SI believed apricots aboriginal.

#### PETS

672-678. Dogs. EN dogs from gods (yebiche). Short-haired type height of fox terrier. Long-haired type larger. ST dogs scarce; one in informant's village. SC, Ci scarce; Ci every family did not have. Li from Mexicans after own breed extinct. Wa tradition states man of Willow clan brought first dog from N while Wa people lived at pool at foot of 2d mesa.

673. Naming of dogs. WN color names. SC word for dog, sicheyani; named for peculiarities, such as black nose; interpreter's dog called machize, spotted. Ci dog and coyote called ba'; sample names: ba'notol, striped dog; ba'sichine, dog eating too much. WM named for mt. lion, fox, etc.; informant's dog named dinosuze, horse with stripes. WS named for color, head, tail, etc.; e.g., black ear, striped head; also for carnivores: mt. lion, etc. Me like WS: four eyes (on account of spots over eyes), stubby tail (if tail cut off or naturally short), blacky; also for carnivores. Ol names: white, spotted, etc. Wa for totems. Zu dog might be called "look"; some named for color, appearance; some for carnivores: mt. lion, fox, coyote; no clan names. SI for wild animals from rabbit to buffalo.

674. Dogs not talked to, because if replied speaker would sicken or die. NT, Ci not talked to, but not dangerous. ST: "Who wants to talk to a dog?" was informant's retort to my question; dogs called, urged to pursue, ordered away. WM dog thought to know of impending events. KP turn to stone if dog replied, hence addressed no conversation to dog.

675. Burial of dogs. NT in brush clump, stones over so vultures not eat. Li under branches. Wa well-liked, useful dog under stones. SI buried good, threw worthless in bushes. KP well-liked dog under stones. Wa, KP reared puppies on soup if dam died. EN goats sometimes suckled.

676. Dog used in hunting. See elements, notes 126-132. WM informant's dog dinosuze caught rabbits, etc., for master.

677. Difficult to determine if mere aversion or actual fear to eat dog. Seemed to be fear: WN, EN, ST, KP. WN cease to be human if ate. SC because of its omnivorous diet. Wa tradition of dog eating. KP dog "human," not eat it; forbidden from "beginning of world."

678. Castration of male dogs. WN, EN, Ci, SA, SI for home-staying qualities. EN hanged dog till unconscious, operated. Nonurination about dwelling objective: NT, ST, KP. Zu hunting dogs.

679. Domestic turkeys. Wa tradition of turkeys reared for feathers; feathers of wild turkeys from W Apache groups (681). Zu turkeys once reduced to 5 birds belonging to 1 man, so insufficient feathers for priests' prayer sticks; imported feathers of wild turkeys from W Apache; 50 young wild turkeys added to tame flock, now ample feathers for monthly prayer-stick planting. SI turkey feathers for regalia; for Deer dance strung on sinew, hung back of dancer's head.

680. Some groups failed to rear young wild turkeys in cages. EN claimed success; caught large young ones on roost at night, cut feathers of one wing; old people ate pulverized quills after feather barbs removed. NT success, keeping in hutlike cage until large enough to kill and pluck; not eat. ST young turkeys caught, reared for feathers. SC hunted, took none alive. Ci young wild turkey for pet, not feathers or meat; "belonged to tribe like child"; when adult, ran away. WS small roofed brush corral; died before mature. Hu domed cage (701); died before mature. Me small turkeys went mad, starved when caged. Li tied string to foot, no cage; unsuccessful. Ol young died in captivity.

684. Hawks killed. SC for arrow feathers; all birds killed except eagle. Ci killed for feather. KP hawk killer fasted 4 days away from village; feathers presented to elders, as in eagle ceremony (691).

685. Hawks caged. Ci afraid to keep lest owner sicken. Me sparrow-hawk only; when tame, came and went at will. Li sparrowhawks and others. Wa sparrowhawk on string, no use of feathers. Zu red-tailed hawk and another caged, plucked periodically.

686-698. Eagle taking. See elements and notes 82, 93-101.

686. Adult eagles killed. Ci, WM sometimes killed eagle gorged on fawn or rabbit and unable to rise quickly. Ci also shot perching eagles. SA shot adults.

687. Caged eagles seem to have been taken as eaglets rather than adults. Me believed sang when owner having hunt success. SU eaglets when trying to fly, caged at home, plucked when old enough (688). Zu captive eagle drinking water with rabbit manure; owner took some in mouth, sprayed eagle to make tame. SA no ceremonial for eagle killing, catching, keeping.

688. Eagle feathers plucked. NT wing, tail, down feathers. Zu covered eagle's head, held feet, plucked; feathers for dance costumes. KP sometimes ran down gorged adult, plucked, released; eagles not killed.

689. Eaglets taken by any hunter. WS tapped on head to render unconscious; tied, took home. Li no chief, shaman, medicine required to take eagles. Zu finder of nest marked place with tree limb on rock. SA eaglets taken from nest. SI if nest inaccessible tied rabbit or bird to long pole, held near nest, so eaglets fluttered out. Carried home, built cage. KP note 2943.

690. If inaccessible, HP shot flaming arrow into nest so eaglets fluttered down.

691. EN and 3 W Apache groups tied eaglets to log at nest; parent birds fed; plucked when old enough, released from log, but left for parents to continue feeding. NT put white beads on tarsus of one eaglet; also helped feed denuded eaglets.

692. See note 2943.

693. Eagle cage. Me brush hut with perch. SU framework hut, buckskin cord on foot (694). Wa small open-shed shelter on housetop, tied to stick weighted with stones. Zu square cage with rock in middle, turquoise buried beneath; old clothes on top for shade; usually near horse corral. KP of ocotillo branches, tops tied together, circular ground plan.

694. WS tied captive to tree some distance from house.

695. WN, SU filed beak with abrasive stone, SU also talons. Released after plucking; remained around camp, fed scraps, grasshoppers; fledged flew away.

696. Wa buried slain eagles in special place. KP no eagle sacrifice.

698. Ownership of aeries. WN family. NT clan Yakohikain; no other clan could take. ST community, chief received feathers. SU discoverer entitled to eaglets for 4 years; relatives in council then decided owner for next 4 years. Wa clans; special men took eaglets. KP "eagles unlikely to lay in same nest again," but if did, another community might decide to take eaglets; no vested right in aerie.

699. Mockingbirds kept. NT, SC, WS for song; young birds reared, released, returned regularly to cage; fed sunflower seeds, grasshoppers, worms, etc. Zu caged, plucked periodically.

Other birds. Mourning dove (Hu, Li, Wa), white-winged dove (NT, SC, KP), quail caged (WM). EN caged, reared, ate "snowbirds" (apparently Junco), taking young about ready to fly. White-winged dove (*Melopelia asiatica*) for song by NT, SC; latter called it kidustete. Ci reared Band-tailed pigeon squabs (*Columba fasciata*) on acorns and seeds; kept around house, not caged. Young quail in cage by WM for few days. Wa sometimes kept Mourning dove (*Zenaidura carolinensis*) squab on string; freedom of house when tame, returning to roost. (At Hopi village of Moenkopi I saw tame macaw, 15 years in family.) Zu jays caged for feather plucking. One KP family had pet crow.

Mammals, snakes. Me no success with wildcat kittens as pets, too pugnacious; bear-cub pet released when too big for safety. Li did not tie or cage bear cubs, but encouraged to stay around camp by feeding; killed, eaten when grown. Wa sometimes tamed baby jack rabbit, kept in house. One KP family had pet coyote. Wa only group capturing snakes, for snake dance.

700. Square bird cages. Li of yucca leaves. KP of saguaro ribs.

701. Round bird cages. EN domed willow cage. WM of bear grass. KP round cage or hut for eaglet only; see note 693.

## HOUSES

Dwellings ranged from lean-to and brush hut at one extreme to storied, plastered rectangular, communal pueblo structure at the other extreme. Intrusive at E edge of area is tipi of Plains Indian origin. Only 2 groups (Ll, Ol) used tipi to exclusion of conical or domed brush hut. Two other groups, using tipi (Me, Li), used brush hut. Some hybrid structures in which skins partially covered brush huts (element 724).

### Dwellings (Thatch and Earth Covered)

The relationship of conical and domed brush huts is not clear to me, especially among groups which use both. They may represent nothing more than variant uses of available materials. The conical hut required heavier poles than the domed structure, which took advantage of the elasticity of slenderer poles, and supported a heavier weight of thatch if bent convexly than if laid straight. Moreover, the domed structure because of convex external curvature gave slightly more head room than a conical one, but obviously this was not a determining factor or domed huts would have completely displaced conical. Both lacked center posts.

As same structural elements occur in different types of houses, I here describe the types found with each group, apart from tipi, pueblo, lean-to, shade, corral, and sweat house.

WN, EN typical dwelling was conical, more or less earth-covered, hogan. 3 forked posts for foundation placed at N, W, S; never on E, which entrance faced. Many smaller posts added to sup-

port brush or bark and earth covering. EN juniper bark, WN *Chrysothamnus* shrub if no juniper bark. Tightness of earth covering varied with season; in hot weather brush hogan with little or no earth covering. Smoke hole just forward from peak of hogan, but about centrally located, as slope toward door longer than back slope on account of poles leaning against horizontals that form sides of entrance-cover roof. (See Gordon B. Page, Navajo House Types.)

Three other types of WN, EN houses declared modern by some informants:

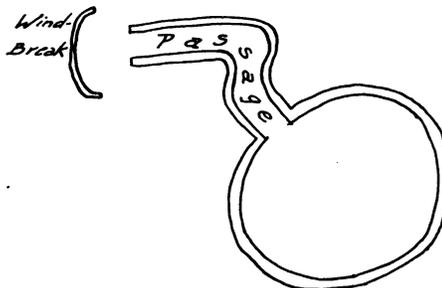
(1) 4-posted, flat-roofed hut (called midjasi hogan, 4-legged hogan), with sloping poles leaning against 4 horizontal stringers resting on forked corner posts, partly earth covered; best described as resembling Pima type (cf. Goddard, p. 129). Elliptical or oval ground plan with diameter 15 by 30 ft. to 10 by 20 ft.

(2) Octagonal house of horizontal logs, crib-construction, cribbed-log roof, earth chinked. Smoke hole increased in size in hot weather, reduced in cold. House called dizike. For ancient cribbed-log roof, see Kidder, *SW Archaeology*, pl. 28.

(3) Stone-walled house, mud chinked, elliptical or oval ground plan, with domed roof of log cribbing, or sometimes horizontal log roof. Diameter 10 by 20 ft. to 15 by 30 ft. House called tenakte (stone circle).

NT hut domed, inner thatch of juniper bark or grass, outer thatch bear grass. Thatch loose, not in bundles, tied in place with yucca leaves (ikaye). Floor not dug out, because rain water would enter. In summer, fire outside entrance, which S-shaped covered way leading into hut. In winter, in center of hut. Wind screen ca. "10" ft. in front of entrance, ca. 5 ft. high.

ST domed, 4 foundation poles bent over and tops tied for start. Red grass, big grass for inner thatch, singly or mixed. Bear-grass outer thatch. Entrance passage ca. 10 ft. long, 4 ft. high, S curved to exclude draft. Chiefly winter used. (See fig.) Entered stooped. 5-ft. high, wide wind screen in front of S entrance, ca. 5 ft. from entrance; sometimes sat there.



SC domed hut of branches, thatch of bear grass or tule; latter from Wheatfields valley near Miami. Horizontals bound on bent branches of frame with yucca-leaf ties; same for binding thatch. Might live in caves in winter.

Ci huts, domed and conical, called kowa. Frame-

work of branches with bear-grass thatch bound on with Spanish-bayonet leaf lashings. Juniper bark not used account fire risk. Encircling hut was little trench to conduct away rain water. Single-curved, covered entrance passage to exclude wind, low at mouth, higher at junction with hut. Curved brush screen in front of entrance. In summer, fire in area between this screen and mouth of covered entrance way.

WM domed and conical thatched huts; former for summer, latter for winter belied by preponderance of conical huts in August, 1935. Conical of cottonwood or juniper poles, 4 foundation poles tied at top with yucca leaves, bases buried ca. 1 foot, no orientation of entrance. Yucca leaves for binding poles together and lashing on bear-grass thatch; for thatch, bindings passed under some poles and over thatch. Small smoke hole in conical house at peak junction of poles, made smaller in winter to conserve heat. Domed house lacked definite smoke hole. In summer fire outside doorway. Crescentic windbreak of piled brush in front of doorway.

WS domed and conical thatched huts. Domed ones like SC; conical like WM, except 3 foundation poles, lashed together at top with rawhide; tied on ground, then set up. Bear-grass thatch for both types; rawhide from wild cattle over portion of exterior above beds. Domed-hut framework of ocotillo where available. Doorway merely opening in side, framed with stick at top and sides.

Hu only domed thatched hut with earth heaped around base. Bear-grass thatch. In modern times thatch only on lower part in some cases, upper covered with rawhide from wild cattle. Framework of oak branches or willow, ditto horizontal binding poles which tied on with yucca-leaf lashings, as also thatch. Floor covered with sagebrush, bear grass, etc. Smoke hole merely parted branches. Fireplace slightly excavated, enclosed with stone slabs to shut off wind (743).

Me had 3 types of houses. Domed brush hut (kowa didjule, ball house) with smoke hole, thatched with bear grass, over which covering of 7 or 8 dehaired buffalo hides, pegged to ground; doorway closed with skin hanging. For other Me house types see 751, 782.

Li had 4 types of houses. Domed hut framework like SC (Goddard, p. 149), thatch of bear grass, tule, or cabbage-palm-leaf sheath, in which fibers cross "like warp and weft of cloth." Sometimes ca. 8 buffalo hides over thatch. Conical hut ca. 11 ft. high, bear-grass or tule thatch, sometimes covering of 7 or 8 buffalo hides. Occasionally old hide saddle blanket hung in doorway. For other Li house types see 751, 782.

SU domed hut without center post. Frame of juniper branches; thatch of juniper bark, thickest on top; no hides. No earth covering or banking.

Wa conical hut like Navaho hogan for shelter from rain when working in fields; hut called umuki; "old Hopi type, not recently from Navaho." All details of Navaho hogan; no center post, 3

forked foundation posts, many small poles, juniper-bark thatch, earth covering.

KP house like Pima pictured by Goddard (p. 129). Wattle house (i.e., vertical stick walls plastered with clay) modern. Walls and roof of old type of mesquite branches with saguaro-rib horizontal pieces. Inner thatch of greasewood, outer of loose grass, lashed on with split yucca leaves. Additional thatch in middle of roof to give slight run-off for water. Earth on more or less flat roof and banked ca. 1 foot around base of house. Doorway with curved "lintel," no built-out porch. Saguaro-rib thatch needle, one worker inside, other outside. KP denied adobe structures like Casa Grande ruin.

705. Diameter, in feet, of houses with circular ground plan. EN 10; NT, ST, WM, WS, Me 15; SC 15-20; Ci, KP 12; Hu, Li, 12-15; SU 8; HP 16.

708. Diameter of corner posts of dwelling house. WN, EN (8 in.); KP (12 in.).

709. Height of interior of houses, other than tipi and pueblo rooms, in feet. WN, ST, SU, Wa, KP 7; EN 8; NT 10; SC, Ci, WS 10-15; WM 7-14; Hu 8-9; Me 7-11.

733. House floor dug out, depths in inches: WN, Wa, 12; ST, SC, WM 8; Ci, Hu, 5.

735. Doorway heights in feet, in houses other than tipi and pueblo rooms. WN 6; EN, NT, ST, WM, Me, KP 4; SC, WS 4-5; Ci 4-6; Hu 5-6; Su 3. EN to support entrance cover, posts rise from periphery of house proper.

737. Doorway E: WN, EN, Ci, Wa, KP; NE: NT, ST; N: SC.

739. Doorway closed with woven mat of juniper bark or Spanish-bayonet fiber (EN), with skin (SC, WS, Hu, Me, Li), with pendent grass (SC, WM, KP), with blanket (WN, SC, Wa, KP sometimes).

750. SU 2 fences of brush built out a few feet from each side of doorway; curved to help exclude wind.

#### Skin Tent

751. Diameter, in feet. Me 15; Li, Ll, Ol 12-15. Total number poles. Me 14, Li 12-16, Ol 12-15, Ll 15. Materials for poles. Me tipi called kowa kodeti, tall house; of sotol stalks in plains; yellow pine, Douglas fir, spruce, quaking aspen in mts. Li Douglas fir, spruce, quaking aspen. Ll fir saplings from mts., no suitable timber along river. Ol fir.

752. Number of buffalo hides for cover. Me, Li, 12; Ol 5-6 (sic); Ll 10-15. Me had rawhide thongs on tipi cover edge.

755. Tipi entrance faced downwind (Me), E (Ll, Ol). Ol faced sunrise which usually downwind.

757. Li stones for temporary tipi fastenings. Loose grass or sagebrush on floor.

760. Me tipi cover carried with travois, a few poles only taken, new ones cut. Ll cover on horse's back, poles dragged, owner walked or rode another horse. Ol divided poles equally on travois; horse dragged to next camp site.

761. Li painted realistic designs on tipi cover: buffalo, sun, etc. Said to be old, not ghost dance.

762. Li back rest on tripod; of willow sticks tied with rawhide; served also as part of mattress. Used in skin tipi and brush hut. Rolled up, carried when moving camp. Always horse, so moving easy.

763. Me temporary shelter of 1 pole supporting skin cover which pegged down. Two additional poles as ventilator adjusters.

#### Masonry Houses

765. Masonry work. Wa sometimes filled old structure to make better foundation for new, but no filling of lower-story rooms otherwise. SA lower part of walls (foundation) of stone, upper of adobe bricks; round and angular stones, from around pueblo, used; men and women worked together on masonry. SI adobe, "because too far away from proper stone." Lower-story rooms for food and miscellaneous storage (Wa, Zu, SA, SI).

767. SI roof of large timbers, smaller timbers at right angle, willow branches, grass, lastly mud and earth.

768. Zu men assembled willow branches for house before beginning construction.

769. Wa special gray clay for floor surface. SI polished adobe floors with pebbles.

770. Wa "pink" plaster on inner walls and white clay (not gypsum) for whitewash. Zu white plaster from place ca. 12 mi. from Blackrock, on reservation, on road Blackrock to Gallup. Another mine for white plaster near Zuni; very small entrance, roomlike cave within; material not burned, merely dissolved in water. Applied with hands wrapped in rabbitskin. Outside plaster of adobe and wheat straw applied with bare hands. SA burning gypsum for whitewash modern. SI fawn-colored clay for inside plaster, from pit 300 yards S of San Ildefonso; sifted (632) through twilled yucca basket (1624), mixed with water, applied with bare hand.

771. Low "bench." Wa stone. Zu flattened log; also rolled blanket to sit on. SA cottonwood block, SI adobe; all ages and sexes sat on it.

773. At Wa I saw cornices of clay with slabs of stone on top, clay resting on projecting roof timbers and sticks.

779. Wa burned holes to receive ladder rungs; ladders tied top and bottom to prevent sides spreading. Zu prevented spreading with pegs inserted in projecting ends of top rung and by burying bottom in earth. SI only sometimes tied on ladder rungs instead of inserting. Zu covered hatchway openings in cold weather with bundles of grama grass made by men.

780. Zu notched-log ladder to connect roofs of slightly different height. SI notched-log ladder outside, sometimes inside.

#### Lean-to, etc.

782. Me, Li double lean-to thatched with tule, also with bear grass by Me; called kowa chiskane, lean-to house, by Me.

784. Single lean-to against limb or horizontal pole from tree (WN, EN, Li), tree trunk (WM), rock (WN, EN). Li as dwelling sometimes; covered with hide. WN covered with brush and earth, EN with piñon bark and earth if in mts. WM branches against tree trunk for temporary shelter. Wa 2 long posts in front, 2 short behind, roof and back brush-covered, sides covered halfway with brush; slept in at fields; called puhuki (leaning over). KP used as shade near regular dwelling; usually 3 leaning posts to support brush.

785. Dug pits as temporary dwellings. Wa applied term chükachi to square pit with stairway cut in earth on one side; roofed with heavy sticks from side to side, brush, soft grass, with mixture of clay, water, sand on top. Used as rain shelter; no fireplace. KP pit "house" similar, steps down one side; ca. 6 ft. deep; roof raised slightly above ground level, thatched, earth covered. Timbers for roof from side to side, no supporting posts. Square ground plan, just big enough for 2 people to sleep in in winter. Neither Wa nor KP pit shelters comparable with pit houses of Basket Maker 3 and Pueblo 1 periods.

786. SU family on move usually lived under trees.

787. Rock shelters as winter dwellings by Hu when hiding, by SU from preference. Me lost hunters took refuge in cave.

#### Assembly (Ceremonial) Places

Ranged from masonry kiva of Pueblo villages through corral or fence to mere open space.

788-792. Masonry kiva. At time of visit number of kivas reported: Wa (5), Zu (6), SA (2), SI (2).

Wa built on cliff ledges, so one wall formed by cliff. Hatchway in roof covered with grama-grass bundles in cold weather, made by men; ditto Zu. Zu kiva not separate structure but room in pueblo. 6 kivas associated with 6 cardinal directions. Tradition says kivas at Hawi-kuh, prehistoric Zu village, were round, whereas square rooms now utilized at Zuni. Zu societies did not meet in kivas, but in family rooms. SI 2 kivas, summer and winter; former S of latter; floors ca. 1 ft. below outside ground level. Maize dance in summer kiva.

793-796. Council house. WS, Hu outdoors, in winter within corral with central fire, no special orientation of entrance. ST large dwelling for discussions by men; plenty of tobacco in possession of owner prerequisite. Me chief's tipi or specially large domed hut (family dwelling, not special council house). Li council of elders met in house of chief (naneta'), in corral

in winter, in open in summer. Wa head chief's house was place he met with priests of different societies. SI governor's house as meeting place. KP chief's house larger than others, used for council meetings, which also outdoors sometimes; chief's family remained or retired to smaller house.

797-802. Dance place. More frequently open space than structure.

797. EN special hut sometimes for sand painting and other religious activities; for squaw dance, square shade (799).

801. Corrals for dances. WN called ixnache. EN constructed for bear and fire dances. KP circular corral for vigita ceremony; torn down after use. WS sometimes danced in open, but in winter especially erected brush corral; corral always for deer ceremony (155) and curing ceremony (2893).

#### Shades and Enclosures

803. Windbreak of branches. WM for shelter when hunting, etc. Hu sometimes curved windbreak for temporary dwelling when moving. Li as temporary dwelling. Wa of cottonwood branches.

805. Number of posts supporting shade roof. Dependent on size; small 4, larger 6 or 9. WN, EN, Me, Li, Ol, Ll, Wa, Zu, SI, 4; NT, ST, SC, Ci, WM, KP 4-9; SA 4-6. Only shades with 2 or more posts in median line could have center higher than sides; ST and sometimes SA; others denied. WN shade called nedasuka'; cottonwood branches best for roof. NT any kind of foliage for roof. ST shade; thatched with maize foliage. Li bear-grass thatch. Ll for summer shade, also used ceremonially at annual relay race. Wa, SA, SI shade on farm away from pueblo; Wa called 4-post shade takachki, top for drying maize and muskmelons.

807. Square flat-roofed shade sometimes attached to house by WN, EN only; to tree by WN, EN, NT, ST, WM.

808. Zu shade with brush side walls, timbers and earth on top to exclude rain.

809. Zu half-cone willow "arbor" sleeping apartment on top of shade, reached by notched ladder; if too many ants on ground. SI sleeping arbor on top of shade a half-dome of bent branches.

813. Circular, domed, or conical shade. Ll conical with 3 foundation posts, no center post, brush covered. Ol domed, brush covered, no center post. Zu conical.

814-820. Circular enclosure of boughs (corral). WN ixna, for hunters' encampment. Ci nandestil, for summer camp of family. WS made most extensive use, see elements 815-820; for curing (820) see note 2893; for hunting (816) see note 154; for less serious purposes, orientation of entrance not required. SU of juniper boughs for family in summer; for curing (820) no special orientation; for puberty use see note 2434. Wa

hunter's camp corral open to S for sunshine. KP for ceremonies, for treating sick.

#### Sweat House

Lacking the sweat house were 2 Jicarilla Apache groups, Pueblo groups (except Zuni), 2 Papago groups. Presence among Zu would seem due to Navaho example, though denied by informants.

822. Conical sweat house. WN ka'che. EN covered with juniper bark and earth. Hu rawhide over bark and grass, rawhide removed after each use. Zu outdoors for men, indoors for women, closed with woven blanket. Nowadays indoor of canvas, temporary; outdoor of Navaho type, permanent.

823. Domed sweat house. Ci kachi'. WM covered with Navaho blanket, dried after each use; structure sometimes with earth up sides, balance blanket covered. WS closed with rawhide; whole not covered with rawhide, "because steam would spoil it." Me no buffalo hides over sweat house "because steam would shrink them." Li covered frame with buffalo robes. In spite difference, Me claim sweat house from Li.

829. Me, Li stones in fire in center; after fire died out sweaters entered. Li put skin cover on after fire died out. Others heated stones outside, then placed in center (Zu), to right of door as entered (WN, EN, NT, ST, SC, Ci, SU), to left as entered (WS, Hu), left or right (WM). SC basket of water in sweat house for sprinkling hot stones, each 10-15 lbs. weight. WM vesicular lava; hot quartz broke when sprinkled. Zu put pulverized sagebrush on stones, then sprinkled water.

830. ST entrance only faced NE; EN only faced N.

831. Seldom fixed number of individuals took sweat bath. SU limit 3, Zu 1. Other estimates: WN (6-10), NT (6-8), ST (10-12), Ci (6 or 7), WS (about 10; all helped construct; after completion others might sweat too), Hu (10).

832. Daily sweating of men WM only. Only sick women used among Me, Zu. Me sick woman with men; never all women; treatments on different days. SU woman sweats with husband.

833. Number of treatments to cure. WN, Hu 4; WS, Li 1; Me, EN, SU several; Zu 4-5. WN used for broken bones and wounds; denied by others. WN, EN, Me for all sickness; others some only. Rheumatism: EN, ST, SC (not for fever), Hu (4 times in 1 day, once a week), Zu. Fatigue: EN, SC. EN for venereal disease; badly injured or very sick not allowed. NT for fevers, aches; once for headache; if 4 times headache worse. ST not for broken limb bone as would swell. WS not for broken bone, wound, boil, or carbuncle lest poison penetrate and kill; owner warned sick person that used at own risk. Li for sickness only, not for hunt or war. SU for various pains. Zu for cramps. HP lacked sweat house, placed sick person on greasewood foliage over hot stones in pit; covered patient with cotton blanket; done where no wind.

834, 835. Sweating before dance or war. WN men to impersonate deities in masked yebichai dances.

ST 2 sweat houses built for incitement war dance. WS, Hu might sweat before dance or war, not mandatory.

836. WS old man erected, owned sweat house, led singing by sweaters; anyone might use. Hu 4 songs during sweating. Me shaman leader of sweaters sat at rear, sang. Li shaman erected, led singing therein.

838. WS politeness, congeniality among sweaters; poking fun, mean remarks forbidden.

840. WM man just had sex intercourse must wash before entering.

841-843. "Bathing" after sweating. WM, WS rolled in or rubbed on sand when first coming out, reentered, sweated more, came out and bathed. SU, WN, EN used sand if no water. Me sweaters beat selves with grass bundles while sweating. Zu bathed with water from jug.

#### NAVIGATION; SWIMMING

Aside from hide bullboat of Lipan, no craft which floated by displacement. Bullboat was tub of skin, not paddled, but towed and pushed by swimmers. Lipan also enjoy unique distinction of tule raft. Considering scarcity of navigable waters in Southwest, virtual absence of boats not surprising. Equally expectable is greater, but still feeble, use of water craft among Lipan on Rio Grande than among other tribes visited, who had no stream of equal size. Only on lower Colorado would comparable development be found. Ll used no floating device whatever, but crossed rivers on horseback; Ol took children across rivers on horseback.

845-848. When necessity required water transport, logs principal reliance. Cottonwood logs WM, WS, Me, Li, SU; sometimes Ci, Hu, Ol, SI. SC log raft to cross high waters on war party, e.g., when returning from Mexico with booty. Ci log raft shimaeti (sticks floating on water), made of 4 parallel sticks with 4 more across; to cross Black r. in high water; not needed on Cibecue creek; used only for goods (food, bedding, etc.). WM lashed cottonwood or deadwood logs together with yucca leaves, towed by 2 or 3 swimmers, who held yucca cords in teeth over shoulders; for ferrying goods such as mescal and seeds.

WS raft of crossed logs to ferry goods; about 5 swimmers to tow and push across river. Person learning to swim used single log. Hu raft tied with yucca leaves or rawhide; swimmer towed with rawhide rope in mouth. Me square of 4 logs with rawhide stretched across, to ferry children over Rio Grande or Pecos r; cottonwood raft to ferry goods; leading swimmer had rope in mouth, 3 behind shoved. Li ferried goods on single, double, multiple logs, or square raft of tules; last least useful; propulsion entirely by swimmers. Informant (woman) towed with line in mouth. SI 2-log raft paddled with hands or poled. SA modern flat-bottomed skiff (canoa) with 2 boards on bot-

tom, 2 on sides; square ended, front end narrowed; paddled and poled; informants thought aboriginal.

849. Li bullboat for children; informant towed with rawhide rope in mouth; 3 others swam beside to steady.

850. WM baskets only to ferry seeds, etc. Me sometimes ferried food in basket on log.

851. Bridge sometimes log. Zu made 2-log bridge for maskers to cross Zuni river. SI logs resting on crossed posts to cross high Rio Grande; pier of rock enclosed in willow fencing at each end. Informant thought ancient, but no doubt Spanish.

852. Zu, KP no swimming. Overhand stroke was both hands forward simultaneously, then drawn in toward chest; at same time feet kicked up and down. WN learned to swim in exile at Ft. Sumner, New Mexico. In WN region no swimming. ST informant claimed he could swim under water ca. 60 ft. Ol said "women never swam." Wa swam in deep water holes after rain.

853. Me, Li breast stroke women only. SU held nose when head under water. Groups that swam dived head first; ST also feet first.

#### GRINDING

857-878. Metate and muller. Except Li, all groups used. Movement always back-forth, not rotary. Highest development among Pueblo groups with different metates for coarse and fine reduction of food stuffs, i.e., meal and flour.

857. Metate with raised side rims reported and observed only among SU. ST wear sometimes made troughlike. Metates found, not made, Zu. Both found and made, NT. Makeshift of any flat stone ST, WS, Hu, Me.

858. Preferred metate stone for general grinding (not fine) purposes was vesicular lava, except WN, EN, SU. SU hard gray stone (not vesicular lava, not sandstone); pecked into shape with pick (1011). Me first choice vesicular lava from beds W of Three Rivers, 2d reddish stone, 3d gray granite from Sierra Blanca. Zu, SI vesicular lava for coarse grinding; SI muller of same material (875). KP metates: One seen 130 lbs. weight, sides slightly higher than middle, of stone (not vesicular lava, not sandstone) from little hill just S of San Xavier mission. Another, of vesicular lava. Two others flat all way across like Pueblo type. All four for same purpose.

859. Sandstone metates rare. NT disliked account grit in food.

860. Bedrock metates used, apparently all ancient manufacture. Ci near Cibecue. WM used camping. KP had none, but 3 in one boulder just E of Sells, Arizona. Li sometimes ground on flat rock by rubbing, not real metate.

861-864. Notes on some materials ground. See also food preparation, pottery. WN yucca detergent crushed on metate. ST fawnskin under metate to catch meal; sumac berries ground. SU seeds, sumac berries, piñon nuts. WM nowadays coffee. Me piñon nuts. KP wheat ground, beans (625) roughly broken.

865. Metate movable. NT, ST imbedded slightly to make steady. Ll, Ol carried when shifting camp.

867. Pueblo metates imbedded in hardened clay in bin. EN had 4 stone slabs on edge around metate, not actually against; hardened clay on floor inside slabs to keep food clean; buckskin at lower edge of metate to receive food.

868. Several metates, graded for coarse and fine, characteristic of 4 Pueblo groups only. At Wa I saw 3: 1st of vesicular lava, 2d of gray rock, 3d of smooth gray hard rock. At SA I saw 2: one for coarse grinding, other for medium or fine; formerly 5 grades so 5 women worked simultaneously. WM ground thrice on one metate when fine flour desired. KP only 1 metate, but different mullers for coarse and fine.

869. Said to be ancient, but Mexican, were single legs and double legs at one end of metate to give slope. Two legs: WS, Hu, Me. Single leg: SA, SI. Slope estimated 20-30 degrees among 4 Pueblo groups, 10-15 degrees among others.

871. EN man might sing while woman ground. Wa men sometimes sang for party of women grinding. Resting Zu women might sing with grinders.

872. Muller length in inches. WN, EN 15; NT, SC, Ci, WS 8; ST 5-7; WM 8-10; Hu, Me 6-9; Ll, Ol, Zu, SI 12; SU 10; Wa 12-15; SA 10-15; KP 8-12. Wa muller equalled width of metate. NT of Strawberry valley made own mullers.

873. Muller shapes varied in transverse cross section from rounded rectangle to flattened ellipse. Between these extremes probably complete intergradation. Intermediate form oval in transverse cross section: Ci, WM, WS, Hu, Me, SU, Zu. Flattened ellipse form: WN, EN, SU, SA. On occasion any conveniently round stone for muller: ST, Ci, WS, Hu, Me, Li. WN muller seen 15 in. long, thin, elliptical in cross section, of close-grained granitic stone (876). NT muller used on one side only, that flat; other side rounded, entered in element list as "rectangular (rounded) in cross section." Ci mullers from ruins or made; rounded rectangle to oval in transverse cross section, one surface usually flatter on account use; when too smooth, both muller and metate pecked to roughen. Hu muller flattened on grinding surface. Zu muller top and bottom alike as both used for grinding. Of SA mullers, I saw one oval in cross section, used on 2 sides, 15 in. long, of vesicular lava; 2 or 3 ca. 10-12 in. long, flattened ellipses, used one side only. KP only one surface for grinding.

874. Wa muller triangular in transverse cross section. Flat basal surface for grip, one of two sloping sides for grinding surface. See Bartlett, p. 16.

875-876. Quartz for mullers, WM, Me, SU; WM used with vesicular lava metate. Hu sometimes sandstone muller. Me preferred vesicular lava for metate and muller; granite used considerably because more readily obtainable. Wa vesicular lava muller for lava metate; close-grained hard stone mullers for other metates. Manipulated with one hand if other brushing up meal.

879. Bedrock mortar characteristic of mesquite belt; often near ruins and apparently used also by former natives. WM sometimes used for walnuts. Li sometimes used bedrock depressions in mts., to be regarded as incipient bedrock mortars. SU pounded meat in rock depression with cobble. SI bedrock mortars near ruins never used.

880-882. Portable stone mortar for food. Me had some, believed of natural origin. Apparently natural pestle used. Meat pounded, not medicine or tobacco. Li large and small for meat, dried mescal, mesquite beans. Pestle found, not made, natural or ancient pestle. SA mortar for meat; I saw shallow one with cobble pestle; mortar made by informant with steel tools. SI mortar pecked out, exterior unworked; not know if pestle (892) natural or worked; pounded meat, juniper berries (latter as preliminary to grinding on metate). HP for mesquite beans; inside chipped out with iron bar, outside not worked.

883-887. Small portable stone mortar and pestle.

883. NT made, working only interior; made small cylindrical pestle (895). At Wa I saw small mortar with concavity oval and shallow; shaped inside, outside; for pounding dried meat. At Zu I saw shallow rectangular stone mortar for meat pounding (see note 466). Small cylindrical pestle used by NT, Wa, SI.

885. WS pulverized tobacco, and leaves mixed with tobacco, in small portable stone mortar. NT pulverized leaves only. WS only, shaman sometimes used small mortar for his preparations.

886. Hu pounded paint on any flat rock—no mortar necessary. SI small triple mortar holes in single stone for pottery paint.

888-890. Wooden mortar. Hu of maple, cottonwood, oak; for mesquite; shaped with flint tools, not fire. KP mortar in mesquite stump with stone ax, no burning; mesquite pods pounded; denied cottonwood mortar. HP portable, used for mesquite; hollowed with tool, not fire.

890. Stone pestle for wooden mortar (length, inches): Hu 12; KP, HP 15.

891. KP wooden pestle ca. 4 ft. long; used in pit mortar (897) for cooked mescal.

896. Pit mortar lined with hide. Me pounded 3 kinds juniper berries, mixed with water in wooden bowl, boiled in pot. Ol for dried meat. KP only lined pit mortar with buckskin, not rawhide.

897. Pit mortar with stone at bottom. NT where no bedrock mortar handy. KP slab lined.

900. Ci pounded alligator-bark juniper berries in pit mortar; caked for storage; soaked and drunk later. Me note 896.

#### BRUSHES

901-903. Grass-stem bundle tied in middle, a prehistoric type brush used by all except Li. One end even, other irregular; Ci, WM, SU even end for hair, uneven for meal. Ci tied with buckskin strip. SU made also of sagebrush stems.

Wa brush 1 1/2 ft. long, of tall stiff grass which grows in sandy places in autumn; used for hair (even end) and general sweeping (uneven end); for meal another brush. Third grass "brush" as strainer when adding ashy water to maize meal. SA separate brushes for hair and meal, former of finer grass. SI 8-inch grass brush for hair, long grass brush for house sweeping, brush of branches for plaza sweeping. KP grass brush for hair only, especially lice; no meal brush, used hand for meal.

904. Porcupine tail for hairbrush. EN, SU only. Me sometimes pine cone. SA modern oak comb.

906. Agave-fiber brush for meal, NT, ST, Hu, Me. For hair Ci, Me, Li. Ci, Hu separated fibers from green leaf by "combing" lengthwise with roughly serrated natural stone. Fibers doubled and tied when green, making brush 5 or 6 in. long. Hu tied buckskin over folded end for handle.

907-909. Swab for imbibing liquid. EN juniper-bark swab (909) for deer soup and now for goat's milk. Ci for bear soup, especially floating grease; remainder of soup, i.e., water, thrown away. WM for bear soup, which not drunk from basket or other cup.

908. WN deer's tail. Me deer's forefoot. KP, HP rabbit's foot for rabbit soup. Me stick handle to deer-foot swab.

#### STIRRERS AND STONE LIFTERS

910. Paddle. NT ash wood, for stirring and tasting mush. Me oak, for stirring. SU juniper, 15 in. long, for stirring. SI piñon wood or yellow pine, for stirring maize meal while parching after 1st grinding and preliminary to 2d grinding; sometimes hot stones moved with it. KP saguaro wood, only slightly broadened blade.

911-914. Devices for handling hot stones. Not in element list is handling stones and pots with rawhide or buckskin, Ll, Ol.

912. Ci, WM forked sticks for placing, removing hot stones in cooking basket. WM picked up with 2 forked sticks. SU forked stick, on to which shoved hot stones with straight stick. KP forked stick for lifting maize ears off fire, not for hot stones.

913. NT ash-wood tongs for hot stones in basket boiling or earth-oven cooking. Li denied lifting hot stones; mescal-oven stones and sweat-house stones heated in place. KP handled small hot stones with cactus tongs; larger shoved into place with stick.

914. Withe looped under hot stone. Not looped-stick food stirrer of California. NT, Ci for sweat-house stones.

915-917. Stick food stirrers.

915. Single stick for boiling meat or soup. Hu pointed stick (919) with which meat also speared. Wa meat stirrer. SI for soup.

916. Two-stick food stirrer EN, NT, ST, SC, Ci, WM, Ol, Wa, SI; 3-stick WN, EN, Ol, Wa, SI; 4-stick EN, Ol, Wa, SI; 5-stick WN, EN, Ol, Wa;

6-stick EN, Wa; 7-stick WN, EN, Wa. Ci not tie 2 together. SI 2 to 4 to stir parching maize.

917. Wa 10- to 12-stick stirrer for maize. Zu similar device of peeled willow sticks, tied together at one end.

#### SPECIAL RECEPTACLES

920. Mollusk shell as container. ST aversion because shell lived in water. Me, Li river-mussel-valve paint dishes. Me from Pecos r. Li large marine-shell cups, by trade from Gulf of Mexico. Ol no mollusk shells, cups and ladles of pottery. SI marine bivalves or limpets (?) for paint; river mussels too small.

921, 922. Turtle- or tortoise-shell cups. Turtle shells WN, EN, Ol, SU. Tortoise shells Hu, Me, Li, Ll. WS ate both reptiles, presumably used both shells for containers. Me tortoise-shell cup; Li small shell for mixing paint, large for hide soaking (1034). Ll cup or food bowl.

923-927. Horn spoons and ladles.

923. EN shaman's ladle of mt.-sheep horn as grease container. Wa mt.-sheep horn from Havasupai.

925. Me buffalo drinking horn had hole in concave side so access to lips easier; buckskin thong to tip to hang on saddle.

926. Li buffalo-horn ladle (Wissler, fig. 31).

927. Li buffalo-horn cup by heating horn, stuffing with rawhide to force into shape; point cut off; buckskin thong attached for carrying. SU mt.-sheep horn, buffalo horn in hot, damp sand in making ladles; horn opened and spread; narrow part for handle. SI boiled horn.

Items not in element list: SI spoon from deer horn where branches, boiled in working. EN ladle or spoon of deer's chin skin, no handle, for soup drinking.

928. Wooden spoon or ladle. WN cottonwood, for mush, etc. Me mt. mahogany or oak, for stirring; mt.-mahogany spoon made by breaking branch at fork, working down by filing (989) with abrasive stone. Li oak and pecan wood; small ones for drinking soup, large for stirring and dipping up; cut out with flint hatchet (998), ground down with sandstone. Zu oak, red "cedar," also a yellow wood; oak spoons for mush eating; ladle of wood something like cottonwood, for dipping up. SA oak ladles to stir and dip; also pottery spoons and ladles. SI long-handled ladle of cottonwood or pine, for dipping up meat. KP ladle of palo verde wood; green Spanish bayonet leaf makeshift spoon.

929. Stone cups and dishes in KP creation story, not now.

931. Husk of dead mescal butt as container. Pitch container by NT, ST, SC, WS. ST as bowl for soup mixing; no stone boiling in it. WS sometimes coated interior with pitch, used as water vessel. SC old baskets as pitch containers.

932. Wooden platter for meat. WN only bark slab sometimes. Li of oak and pecan wood; chipped out, smoothed with sandstone. Zu oak platter.

933, 934. Wooden bowls. Oak (934) favorite wood. WN shaman's oak bowl. EN of mt. tree, probably quaking aspen. ST of "wart" from blue-oak bole. Ci none made, but concave piece of wood found. Hu of oak, maple, cottonwood, shaped inside and out with flint; mixing bowl for wal-nut and mescal. Me of oak and quaking aspen; hollowed by burning and scraping with sharp stone. Li of oak and pecan wood. Ll of oak and tulip tree. Zu bowls and cups. KP of mesquite wood, platter shape, for dough mixing; wood shaped with chipped-stone chisel driven with maul of palo verde or palo fierro wood. HP of mesquite wood.

#### KNIVES; AWLS, NEEDLES

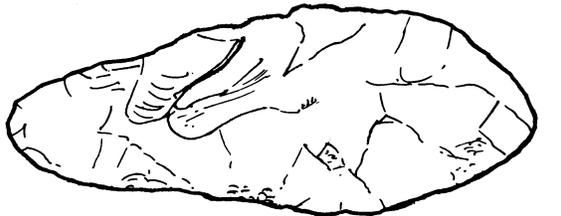
Knives.—Iron knives so early and thoroughly replaced stone, bone, cane, and wooden knives that it is difficult to learn about latter.

935-937. Impromptu flake of stone widely used and example of eolith. Sometimes carried beyond eolithic stage by slight percussion retouching (Ci, Hu, Li). Me used eolithic flake to hack off branch for bow; also to chop neck vertebrae of deer laid on rock. ST sharp unretouched quartz to butcher deer, hack mescal leaves, cut sun-flower stalks.

938-948. Chipped knife, retouched. WN received iron knives in trade from Mexicans before Americans came. Wa made no stone knives; found, believed left by lightning, like arrowheads (1125).

938. Length (in inches) of cutting blades of chipped-stone knives: NT, WS, Me 4; ST, WM 3 1/2; SC, Ci, Zu 6; Hu 5; Li, SU 6-8; Wa 3-5; SI 10; KP 3-6.

939. Double-edged, retouched stone knife. ST of obsidian, white chert, or quartz; handle 5 or 6 in. long, of wood; carried in buckskin sheath on belt. Blade had side-notched base for lashing



SIDE VIEW



to hafting with sinew or buckskin; shoulder hafting—handle not split to receive base of blade. Black stone (obsidian?) from Fossil creek. Me obsidian from near Albuquerque. Wa knives of yellow and green flint. Zu see figure. KP for skinning; one seen, of yellowish brown flint, ca. 3 in. long, no hafting.

940. Single-edged, retouched stone knife. NT of quartz, without wrapped or hafted handle. WM of black flint apparently. SU held by blunt back when used. SI squirrel-skin scabbard for obsidian knife. KP larger and heavier than 939; held by back, as for sawing bone; not used for wood.

941. Chipped knife for butchering. Ci both white and black stone. SU carried in quiver.

942. Chipped knife for carving wood. Me whittled wood for bow, arrow, etc. KP wooden figures of animals (2846) whittled.

943. Wrapped handle of stone knife. Me wet sinew from front leg of deer wrapped around flint, then covered with buckskin. Li no wooden handle; rawhide wrapping on stone, then buckskin over it.

945. Stone blade set in grooved wooden handle. WS tied with sinew. Wa tied with 2-ply string of narrow-leafed yucca fiber.

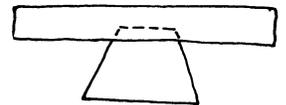
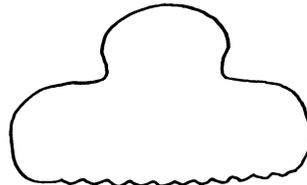
949. Wa cane knife for hair cutting; hair laid on wood to cut.

950. Wooden knife. SI oak knife; cut meat, green maize from cob.

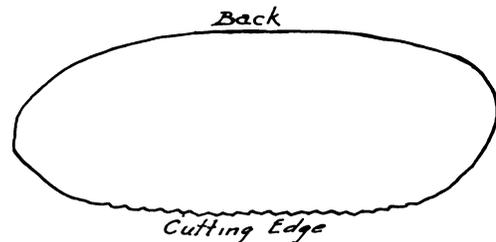
951. Bone knife. Me horse rib for meat cutting; horses from "beginning of world." Ll of deer bone, antler handle; double edged; meat cut.

952. WS, Hu deer shoulder-blade chopping knife to cut and mash Spanish-bayonet fruit.

953-955. Mescal knives. NT unretouched stone flake, 8 in. long; no hafting. ST unretouched and retouched flakes, latter serrate for sawing; no hafting; of quartz, blue stone, white chert; now-adays butcher knife. SC kept several unretouched stone knives in readiness when preparing mescal; also retouched knife of chopping-knife shape (953) with projection on back as handle (left fig. below); unretouched blades for deer flaying.



Ci unretouched flake of dull black stone for leaves of mescal. WS informant knew only iron mescal knife—a hoe blade in median position in wooden handle (see right fig. above), somewhat like SC (Goddard, p. 154). Hu iron "hatchet," sharpened on sandstone; set in middle of wooden handle like SC (Goddard, p. 154); formerly stone. Me iron hatchet from Mexicans, or steel butcher knife. KP elliptical retouched stone knife (fig.)



Back

Cutting Edge

with single cutting edge; held by back, no hafting. HP ordinary iron butcher knife.

Awls, needles.—

957. Hardwood awl. WN of wood called *tuwishdji*, for ear piercing (1359). Zu for perforating soft wood. KP of greasewood, knob handle; for coiled baskets.

958. Hu steel awls and needles used; bone earlier.

959. Bone awl, of deer leg bone. WN front or hind leg. ST tibia, fibula, cannon bone, or badger hind leg bone; splintered, rubbed down on stone. SC lower front leg. Me front leg bone fractured diagonally for awl. SU cannon bone.

960. Bone awl of badger penis bone or wildcat foreleg bone by Wa, no deer leg bone.

962. Awl handle buckskin wrapped: EN, NT, SC, WM, Hu, Ll, SA (also rawhide put on green), SI. Awl handle gum or pitch covered: NT (buckskin wrapped after pitching), Ci, WM, Hu. Awl handle of cottonwood root: Wa.

963. Rawhide awl scabbard: Ll, SA, SI. Buckskin awl scabbard: EN, SU, Zu, SA, SI. Wa carried small buckskin bag for awls, sinews, etc.

964-965. WN bone awl, for coiled-basket manufacture, moccasin sewing; antler awl for making winter overshoes (1470). EN long awl for basket making, short for moccasin making. Wa badger penis-bone awl for moccasin sewing.

966. Awl for boring wood. WS bored cane diaphragm by holding awl between soles of feet and revolving cane reed vertically on it. SU bored soft wood with bone awl.

967. KP 15-inch saguaro-rib "needle" (no eye) for thatch sewing. One man inside house, other out; needle through thatch which 6 in. thick, yucca-fiber binding through hole.

968. Bone needle with eye. Li imitation of Mexican steel needles. Wa of wildcat front-leg bone, for embroidering manta, sashes, etc. Zu to sew cloth sacks (286) made from rectangular loom-woven pieces.

969. Hardwood needle with eye. EN for blanket sewing. KP of greasewood, for sewing cotton cloth and buckskin.

970. Agave spine by SC, narrow-leafed yucca spine by Wa, SA; sometimes for skin sewing. Wa yucca spine with fibers attached to sew sheepskin buskins; to sew maize ears together in "braid" after hole bored with bone awl. SA "needle and thread" if no sinew.

DRILLING AND SMOOTHING

Except for Pueblo groups, working of shell and stone for ornament was scant and drills rare. Many groups reamed out hole with tiny flint held in fingers.

971. Drilling with tiny flint held in fingers. WM to bore socket in hearth of fire drill (1016). Ol drilled *Haliotis* shell for pendants. SU drilled soft stone. KP shell-bead drilling with tiny flint held in fingers, bead held by fingers of other hand.

972. Composite drill, i.e., stone point set in wooden shaft. EN length of shaft varied; cracked pot drilled and tied together with string. ST shaft 10 in. long; shell and turquoise drilled. Ll drilled *Haliotis* shell obtained from Pueblos and Mexicans; in reservation days clam also, for pendants (1238). SU shaft 14 in. long; edge of turtle-shell cup (921) drilled for loop of buckskin; cup set in ground for vise (974) while drilling; river-mussel shell drilled for pendant, edge rubbed down on sandstone (977). SA hard white stone made best drill point. SI turquoise drilled with obsidian point.

974. "Vise" for holding object drilled. Hole in ground: WN, EN, Ll, SU, Wa, Zu, SA, SI. Grooved rock: Ll. Hole in block of wood: WN, EN, Zu, SA, SI. Held by another person, WS; placed on foot at base of toes, ST; held between knees, Wa. ST drilled till wall thin, punched hole through. SA held bead with fingers if using pump drill (976).

975. Zu sometimes bead on hide while drilling.

976. Pump drill for shell beads, WN, Wa, Zu, SA, SI; for turquoise beads, WN, EN, Wa, Zu, SA, SI. WN pump drill from Hopi. SC declared modern; groups marked plus in element list regarded as aboriginal.

977. Smoothing slab of sandstone. Chiefly for beads and pendants. Me modern *Haliotis* pendants. Hu bow and arrow shaft.

979. Strung beads rolled on slab to smooth round surface. WN on string. Wa, SI on sinew string. Zu on grass stem. SA on cotton string.

980. Ci sometimes rubbed on any stone, turquoise, or shell from ruin.

WOODWORKING; HAMMERS, MAULS, AND AXES

Woodworking.—

981. Timber cutting by fire. WN not done, fallen trees for firewood. Ci, WS, KP for firewood sometimes. For Ci hut construction dead wood; manzanita wood, very hard, not used for anything. Hu no need to burn trees as plenty of small wood for huts and dead wood for fires. Zu house timbers from fallen trees.

983. Hollowing wood with fire. Ol wooden bowls, finished with sandstone (989). SI cottonwood stump for drum (2207).

984-987. Fire to make wood flexible. WN, e.g., green wood for shinny stick put under fire 2 minutes, then bent. EN heated to bend, also without heat by inserting between two rocks, bending, tying. NT note 1055. Hu, Me, Zu, SA, SI bow greased with fat before heating over fire to bend. Zu bent stick into ring form by same method. SU no heat for bending; bow bent with tied cord; shinny stick from curved branch.

986. Moist hot wrapping to render wood flexible. See note 1073. NT green leaves and mud. EN, Zu in moist, hot sand.

987. Heating wood in hot ashes to bend. SC wood for child's bow. WM bark on in heating bow wood.

988. EN hardened wooden points by hammering with stone.

Hammers, mauls, and axes.—

Prehistoric grooved stone axes (993) and hammers (999) used by most groups. Universal tool was natural cobble (990) without hafting. Wa white or black cobble for breaking bone, chipping metate, etc.

991. Shaped wooden maul. WN pounded skins. SU oak maul with horizontal foot-long handle, for pounding dry meat on rock.

992. Chipped and ground hand ax. SU made with cutting edge slightly ground; no hafting; black stone (not obsidian) found in creek bed. KP made for use around house; also made chipped-stone chisel for wood carving.

993-997. Grooved-stone ax. EN equipped grooved-stone ax with oak-withe handle; replaced by iron ax from Mexicans. NT did not haft prehistoric grooved ax, used as bone breaker. ST cut dead wood only with prehistoric ax without hafting; cut one side, then turned and broke. SC made grooved polished ax from hard "blue" stone. Ci grooved axes (993) and hammers (999) from ruins not used; no ground-stone knife; except for grinding devices no polished- or ground-stone tools. WM no grooved-stone ax made like those from ruins; one from ruin Kinishba, near Ft. Apache, in informant's possession. WS, Hu grooved axes and hammers found, used without hafting, for breaking bones, pounding dried meat, mesquite pods (Hu), etc. WS cut bow wood with Mexican iron hatchet. Me, Li fitted prehistoric ax or hammer (999) with oak-withe handle; Me cut branches. Li pounded meat and bones; regular Plains stone-headed pounders lacking, but prehistoric axes and hammers made to resemble them by rawhide binding on handle and partly on stone. Ol equipped grooved prehistoric ax (Goddard, p. 50) with oak-withe handle, for wood cutting. Ditto Wa, who warmed withe to bend, used ax to cut timbers for house construction. See note 1010 for Wa grinding of stone ax. Zu shalako gods who purify new rooms have stone axes. SA informant knew only iron axes and hammers. SI stone axes to hew house timbers.

995. KP stone ax only 3/4 grooved, hafted in forked stick, tied above and below with deer rawhide; to cut wood, including house posts. All-round withe hafting not feasible on account 3/4 grooving. Informant had fine 3/4-grooved stone ax-hammer like University of California Museum of Anthropology axes from Sonora and S Arizona. Entered in element list as ax (993) and hammer (999) though all 1 implement. Sometimes used to pound rawhide for sandal.

998. NT cut small trees for shade posts with improvised, unretouched stone ax, made by breaking lump of hard blue stone. No handle.

999-1002. Grooved-stone hammer. See notes 993, 998. EN found but not used. Me found, used

with or without hafting. Ll river cobble, grooved, oak-withe handle, for stake driving, berry crushing, etc. Ol used plain cobble without grooving or hafting; no hafted grooved hammer. SU grooved-stone hammer without hafting to crack very hard seeds. Zu for pounding dried Spanish-bayonet yucca fruit.

STONE FLAKING, GRINDING, AND POLISHING

Flaking stone by percussion known to all informants except WN, who claimed to know nothing about stone working. Retouching had narrower distribution than flaking of stone to secure suitable fragment for use.

EN no retouching of points, knives, or drills; all found. Informant had collection of more than 50. EN explain as thunderbolts (2294a), or made by former inhabitants. Only shamans use (2970). Corroborating nonretouching is fear to use deer-antler tool (1007). ST antler-retouching tool lacked wooden handle. SC mescal knife (953) retouched by percussion. WM knife also (940). WS quartz, not antler, for pressure as well as percussion retouching. Hu, Me, SU percussion retouching with flint tool. SU flint, not obsidian, arrow points; flakes carried home in skin sack. Rested on stone slab to chip. As arrow points made tied on buckskin string around neck. Also one on buckskin shirt as amulet. Wa flaked stone ax (note 1010). SI white, red, and black "obsidian"; retouching by percussion with small lump of obsidian.

Initial process of shaping was pecking with natural cobble or pick; Li disclaimed manufacture of metates and mortars.

1010. Cobble for roughly shaping metate or other object. NT, ST, WM after shaping metate, no grinding into shape other than by use. SC illustrate wide practice of roughening old metate by pecking with cobble when too smooth. SU cobble for pecking footholds in steep ascent. Wa gray stone, of which metates made, to percussion-flake stone ax before grinding. SI small round lump of obsidian for "pick" to batter stone for metate. KP stone ax roughed out with cobble of ax material; heated to aid chipping. Informant's grandmother put hot coals on metate, chipped with steel ax.

1011. Pick for roughing out metate or other object. EN pick of white quartz or petrified wood; no grinding of metate surface except by use; metate stone prized up from layers of rock 3 or 4 in. thick. WS quartz pick for roughing out metate, "over a month" to complete. Hu metate and muller pecked into shape at same time. Me pick of red rock, from near Tularosa, New Mexico, for pecking out metate and muller; iron tool now.

1013. Grinding and polishing with stone. With sandstone, EN, SC, WS, Hu. EN turquoise and jet ground and polished on hard stone. SC rough stone for grinding stone ax, sandstone for

polishing. WS sandstone to grind and polish edges of muller to be held in hand. Hu muller or sandstone to smooth metate after roughing out. Wa depressions in bedrock on top of Walpi mesa "used for grinding metates into shape." After chipping stone ax to shape, ground on hard rock, under water. SI stone ax polished on hard gray stone used for close-grained metates. KP ground and polished ax with ax material, not sandstone.

## FIRE MAKING

1014. Wa sunflower pith or rotten-wood tinder.

1015. Spanish flint and steel apparently succeeded in some groups an earlier percussion method employing two stones. Matter elusive, as no specimens or demonstrations available. Following insisted stones alike and white, some specifying quartz: WN. SC white quartz; punk wood for tinder. Ci, WM tinder finely shredded juniper bark. WM white quartz and finely shredded juniper bark in small buckskin pouch to protect from moisture; quartz from mt. near Black r. Ll, Ol white "flint" stones in rainy weather when drill damp; horse-manure tinder. SU very hard white stone; yellow fungus from oak for tinder, put in shredded juniper bark and blown after spark caught. SA tinder cotton boiled in water with maize-cob ashes; spark transferred to shredded juniper bark. KP stones always alike, yellowish brown, red, white; spark caught on cotton tinder; informant had used. Carried instead of slow match; commoner than fire drill. Zu flint and some other hard stone. Shulawichi, fire god. SI white rock and black "obsidian"; tinder wool mashed with green caliche plant.

1016. Simple fire drill. NT drill bear-grass stalk, hearth sotol stalk, tinder juniper bark. ST, WS drill and hearth sotol stalk or narrow-leaved yucca stalk; foot on hearth when operated. SC drill any shrub, hearth ocotillo; sockets in hearth drilled as needed, with aid of sand. Ci only one socket at time, when worn out made another. WM in buckskin cover to keep dry. Me, Li sotol stalk for both. Ol both Spanish-bayonet yucca stalk. SU both narrow-leaved yucca stalk. Wa juniper heart wood; tinder juniper bark mixed with plant fluff, also manure. Zu juniper-bark tinder. SI rabbit-manure tinder. KP drill grease-wood, hearth saguaro.

1017. Me, Li on war party sometimes operated drill with thong if poor wood. "2 men each worked separate thong, so one pulling against other kept drill vertical."

1018. SI pump drill for fire making regarded as ancient.

1019. Dead wood for fire. Ol carried pitch-wood chips for kindling in wet weather. Wa sage-brush best fuel, burned longest.

1020. Stone ax for cutting firewood on occasion: ST, Wa (juniper branches), Zu, SI, KP. All groups broke dead wood over or with stone.

1021. Slow match of juniper bark. WN or cottonwood bark. NT often burning stick from neighbor's

fire. ST coal of fire between 2 sticks as tongs. WM 2 1/2 ft. long, of juniper bark wrapped tightly with yucca-leaf fibers; sometimes carried when moving. Ol lasted only 2 or 3 hours. Zu also of horse manure and dirt. SA denied slow match, flint and steel instead. SI wrapped with yucca-leaf fibers.

1022. Torch of juniper bark. WN, EN, NT, ST, WM, WS, Hu, Li, SU, Wa, Zu. Of other materials: WN, Ll, SU, Wa, Zu, SI, KP. WN cottonwood bark. NT slow match waved in air broke into flame; not for hunting. Ll for night turkey catching. SI pitch-pine wood, used indoors and out. KP bundle of ocotillo stalks.

## SKIN DRESSING

1023-1026. Flaying.

1023. Cut down belly. SU chin to vent and inner side each leg; horned animal, from nose to horn and around each horn. Skinned head first, cut off, laid aside; then skinned body; god Nomaromapugat thanked. SA deer down belly and legs, but carried out around to outside of legs; freed of fat and flesh with fingers.

1024. Case skinned (from vent). Small incision, skin peeled off in bag form. Ci fawn, pine squirrel, ground squirrel. WM "yellow birds," for man's regular hair ornament, not for dance; skin not stuffed. Zu fawn and wildcat skins for carrying maize meal in ceremonies.

1025. Skinning whole (from head), i.e., peeling down from head, the opposite of 1024. Ol small mammals for tobacco bags (2169), etc. Wa tobacco bags: pine squirrel, flying squirrel, skunk; chipmunk and flying-squirrel skins for "dolls" (2144).

1026. Skinning by blowing under hide. SI method for small mammals only; not feasible with deer.

1027-1031. Hide scraper for flesh and fat.

1027. To remove flesh and fat from freshly flayed hide ST and Ll sometimes used skinning knife. WS, Hu did not scrape hide after removal from animal, as skinned clean.

1029. Hide scraper with stone blade, curved wooden handle. Me stone or bone blade, for thinning thick hide, as from neck. Ll curve-handled and straight-handled (1030) hide scrapers for same purpose; buffalo, deer, antelope hides. Ol straight-handled scraper (1030) on fresh hide to clear of fat and flesh; curve-handled (1029) on dry hide; both on buffalo hide only.

1030. Straight-handled scraper with toothed bone blade. NT, SC of cannon bone, for fat and flesh. Me of cannon bone of deer or buffalo, buckskin wrapping on handle, skin loop for carrying.

1031. SU fleshing tool from bone of animal, hide of which to be cleaned; rubbed down on rock for proper edge; of buffalo, deer, antelope bone. SI ground deer shoulder blade to edge as hide scraper.

1034-1044. Dehairing and softening hides. No buckskin from antelope hide by SC. EN order of events in buckskin making: soaking hide in water,

dehairing, wringing, braining, drying, soaking, wringing; no one must approach worker closely, lest hide harden.

1034. Days soaked: ST 4 or 5, SC 3, Ci 1, WM 1 if fresh, 2 or 3 if old, Me 1, SU 2, Wa 2, SI 3 or 4. WS soaked before and after dehairing. Me, SU sometimes placed hide as lining in dug pit, hair side up, filled hide with water. Portable vessel to soak hide: Li large tortoise shell. Ll, SA, SI large pottery bowl.

1035. Ol dehaired buffalo hide with scraper (1029), deer hide with cannon bone (1035). SU cannon bone for dehairing sharpened on stone.

1036. Dehairing with rib-bone tool. Horse rib EN, ST, WS, Hu, Li, Wa, SA. Deer rib Zu, KP. SA said cattle ribs too soft. WS denied deer rib. Li horse or mule rib, but cannon bone (1035) best; Li horse "present from creation." SA horse rib for deer hide; iron tool for buffalo hide.

1038. Hide on leaned pole to scrape off hair, universal, especially deer hides. Li suspended buffalo and elk hides from horizontal beam supported by 2 forked posts.

1040. Zu dehaired, treated with brains, dried 2 days, soaked in water 2d time, wrung out; sat before fire to work skin soft over foot; rubbed with maize meal.

1041. Hide softened with brains and spinal marrow. ST sometimes jajoba berries (*Simmondsia californica*) as substitute. HP sometimes mashed saguaro-seed substitute. WS pegged hide on grass plot to rub on brains. Me boiled marrow and brains to apply; after drying, soaked in water again. SU soaked in water after brain treatment. Wa washed hide in pot of water after dehairing, soaked overnight in brains and water, sun dried 2 days; soaked again, wrung.

1042. Twisting and untwisting hide to expel water and to soften. See ante. NT after braining, exposed hide to sun 6 days, soaked in water 1 day. To wring, hide tied by hind legs to tree, hide twisted with stick run through eye holes. WM after wringing dehaired skin to rid of water, let hang 1 hour; stretched and worked with hands beginning on each leg and working inward. Li buffalo hide too heavy to wring. SU wrung on tree to express water. SI wringing primarily to express water.

1043. Hide rubbed with stone to soften. SC only deer neck skin rubbed. Hu edge of hide stone-rubbed to soften. Me rubbed with stone only if lacked "elbow" knob of front leg bone for purpose. Li buffalo hide rubbed soft with caliche rock.

1045-1049. Coloring of dressed hide. EN juniper ashes as mordant; after applying dye and wet ashes to buckskin, rolled up, dried; resoftened later. Wa sagebrush ashes as mordant with alder and mt.-mahogany dyes, which produced reddish-brown color, only color applied to buckskin. SA alkali mordant if salt not available.

1045. Following colors applied to dressed hide. Blue WS, Li; black EN, WS, Li, Zu, SA, SI; yellow ST, SC, Ci, WM, WS, Hu, Me, Li, Ll, Ol, Zu, SA,

SI, KP; orange EN, SC, WS, Hu, Li, SA; red and reddish brown WN, EN, NT, ST, Ci, WS, Hu, Me, Li, Ll, Ol, Wa, Zu, SA, SI, KP; white WS, Ll, Zu, SI.

1046. Coloring dressed hide by smoking it. Me, Li by suspending buckskin inside tripod so as to enclose hot coals in little pit. Me buffalo chips on coals smoked buckskin yellow, water-proofed it so not hard after wetting. Li snake-weed, sage bark, or third plant on coals to smoke yellow; protracted smoking made brown.

1047. Red dye from alder bark. WN alder k'ish; from San Francisco peaks; boiled decoction daubed on buckskin with maize cob. NT, Ci soaked buckskin in basket of alder-bark decoction 1 hour; for moccasins (1460), which remained soft. SI alder bark from Rito de los Frijoles, boiled with mt.-mahogany bark, applied with maize cob to moccasin uppers (1459).

1048. White clay rubbed on buckskin. Zu plaster mineral.

1049. Other colors for dressed hide. EN red from plants. Piñon pitch and yellow clay burned in pot, added to boiled sumac-leaf decoction for black, applied to buckskin. ST colored moccasins (1460) with yellow earth. SC yellow earth, moistened and rubbed on; orange dye from root of small shrub or from bark of tree; whole buckskin dipped. Ci rubbed yellow clay on neck of buckskin shirt (1398); boiled decoction of barberry root to dye buckskin (also Me, Li, SI). WS yellow, white, orange, bluish clays, charcoal, to color buckskin garments; no plant dyes. Hu dipped buckskin for clothing in tan decoction from oak bark; done before brain treatment. Yellow and orange clays rubbed on; no white clay. "White" buckskin on salt expedition (422) uncolored. Me, Li reddish-brown decoction of mt. mahogany; Me rubbed on red and yellow earth pigments. Li walnut juice black dye; red, orange, blue clays. Ll white, red, yellow clays; yellow was ocher; on dehaired hides. Ol red, yellow clays on buckskin; yellow ocher, turned red in fire, from Tierra Amarilla, New Mexico. Zu dyed buckskin with decoction from yellow flowers of small bush boiled with white mineral ash. SA applied only reddish-brown dye from shrub to buckskin with maize cob. SI whitened women's spiral buckskin calf wrapping (1456) with clay. Black by boiling *Martynia*. Brick-red mineral from Hopi country on moccasins (1459), unsatisfactory as soon off. KP got reddish-brown dye from root.

1050-1053. Rawhide. ST deer; fawn for woman to sit on. WS deer, elk; latterly horse, cattle; antelope hide too tender except for rope (1051). Rawhide with or without hair; for moccasin soles, bags, mats, covering for stored food, rope. Hu deer; latterly horse, cattle; rope cut spirally from hide. Me deer's neck, buffalo, horse, cattle; for shield, tipi cover, moccasin sole, rope, lashings, club binding, pit-mortar lining, saddle girth. Li deer's neck, buffalo, donkey, horse, mule. Ol buffalo only; latterly cattle. Zu stored dehaired rawhide for future dressing: deer, ante-

lope, wildcat, coyote. SI, making rawhide, pounded with stone, rubbed in heated piñon pitch and grease, pounded further with wood or stone; when soft put on wet ground or in water, if moccasin sole, etc., to be cut from it with obsidian knife. KP deer's neck.

1051. Antelope-rawhide rope. SC 2 plies, stick inserted as made, to prevent twisting too far at one time; tied to tree as twisted; stretched when finished. Ll 6-strand braid.

1052. Deer-rawhide rope (WS, Li). Buffalo-hide rope (Li). Rawhide rope (1750) learned from Mexicans (KP).

## WEAPONS

### Bows

1054. Length of bow: to lower ribs (NT), to armpit (ST), to upper chest (Ci), to base of sternum (SC, WM, Wa), to chest (Me, Li, Ll, Ol self bow, SI self bow), to waist (WS, Hu self bow, Zu self and sinew backed, SI sinew backed). WN self bows various lengths. EN, SA, KP measured by older bows; tall man used longer than short man; average bow ca. 5 ft.

Ol only claimed bows made by specialists, sold bow and 20 arrows for half buckskin. SC some men made bows, sold bow and 4 arrows for 1 buckskin. In making used chipped knife and sharp flakes, also rubbed down bow on sandstone. Crossbow boys' toy WN (modern), Ol ("Spaniards").

1055-1069. Self bow. NT peeled and seasoned wood, trimmed to shape with stone knife, filed with stone. To bend, wrapped in green yucca leaves, damp mud; placed in hot ashes for hour, flexible as withe.

In order of preference Me self bow mulberry, yellow wood from Rio Grande, screw bean, black locust, walnut, sotol stalk, oak, sumac (for boy's bow).

1057. Self bow of mulberry wood. EN wood from Ft. Apache region, Arizona. SC mulberry tree and bow both esti.

1058. Self bow of oak. Wa of 2 kinds of oak (one "brown").

1059. Self bow of willow. ST, SC boy's bow. Ol said willow worthless.

1062. Self bow of other wood. WN pine worthless. EN pointed-top mountain tree. SC "any kind" of wood, especially willow, for small bows, as for boys. Ci red-flowered shrub by river. Hu sotol stalk for toy bow. Li boys' bows of sotol stalk, sumac. Ll juniper, chokecherry. SA hunting bows of oak and Osage orange, boys' of juniper. SI wild-cherry wood; for boys' willow, cottonwood. KP "blackberry" wood only for men's; any kind of wood for boys'.

1063. Self bow nearly straight. SC pitch on bow to help keep shape. Ci painted all over with gum from creosote (?) bushes growing near San Carlos, to strengthen. WM coated concave side of bow with mescal juice to strengthen.

1064. Double-curved self bow. ST self bow with double curve stronger than single curve (1063).

Heated in fire, bent in tree crotch till straight; pitched, put in fire, bent in tree crotch for double curve.

1065. WS painted bow on inside, any color. SA painted whole with white clay, red marks of mineral pigment. SI painted self and sinew-backed bows black outside, red or yellow inside. KP bow red all over.

1066. SA smeared blood of each kill on bow.

1067. WS, Hu, Li, Wa, Zu (?) wound some self bows with sinew, especially limbs where apt to snap.

1069. Ol 2 notches at 1 end, 1 at other; 2-notch end had permanent fastening of bowstring.

1070. "Trussed" bow with sinew cord along back. Hu sometimes black walnut. Two-ply sinew cord ran along back. Windings of sinew (deer, cattle, horse, mule) every few inches held cord tightly against back; windings set in piñon gum or horse-hide glue. WM 2 extra bowstrings attached to back of bow, in case regular bowstring broke.

1072. Sinew-backed bow made locally. Me, Li sinew backing on weak bow, as of sumac. Man who wished to shoot far put antelope or buffalo sinews (1081) on back of his bow, attached with piñon pitch (1088), or with glue of calfskin, pulverized antler, and hoof boiled 2 days and applied with yucca- or mescal-fiber brush (1085). Li applied deer and buffalo sinews to mulberry or black-locust wood worked very thin. Me stringy bark juniper wood (1077) best for sinew-backed bow. SU sinew-backed bow 4 ft. long, not measured on body. Sinews chewed and attached with deer-antler glue (1087), made by heating antler tips by fire 2 days, placing in water, glue "came out" of horn.

1073. Double-curved sinew-backed bow. Zu, SA single- and double-curved bows. SI only latter: bow wood wrapped with Spanish-bayonet yucca leaves, put in hot ashes; when pliant bent and tied with Spanish-bayonet yucca cord. Besides tying tips, cord tied across central reverse bend to preserve double curvature. Sinew applied after wood hardened in double-curve form.

1074. EN, Zu sinew-backed bow with recurved tips of folded sinew, forming knob or hook. Wa sometimes ornamented tips of bow.

1079. Sinew-backed bow of wood other than listed. SA Osage orange. SI wild cherry. Zu bow carried with part down which was lower part of wood on tree.

1080. EN, Ll, Ol, SA wrapped center and ends of sinew-backed bow with sinew. SU wrapped tips with sinew.

1081-1083. Sinews for sinew-backed bow. WN horse sinews replaced deer sinews. WS deer, horse, mule, cattle sinews. Ol deer, antelope, buffalo sinews. Wa horse sinews, also wrappings of sinew. SA cattle sinews. SI deer-, buffalo-back sinews; leg sinews for arrow winding. WN buckskin wrapping at grip.

1084. Li soaked, heated sinews to apply.

1085-1088. Gluing sinew on back of bow. See note 1072. Horshide glue (WN, EN, Hu). EN earlier boiled deer's neck hide, later horse,

cattle hide. Ol juniper pitch or pine pitch, buffalo-hoof glue.

1089-1092. Sinew bowstring. NT sinews from lower hind leg of deer; pounded, soaked in water before twisting on thigh; stretched between shrubs to dry. ST, SC stick inserted between plies when twisting to prevent twist going too far. Me also antelope, buffalo sinews. Li also buffalo-back sinews. Wa also back sinews of antelope and other mammals; bowstring taken off if rain threatening; deer, antelope, or cattle raw-hide bowstring sometimes. Zu one "ply."

1093. Vegetable-fiber bowstring. WS, Hu agave fiber for boy's bow. Zu yucca fiber for wet weather, because sinew stretched when damp. KP yucca fiber for boy's bow.

1100. Bow held obliquely. Me on horseback. Li 45-degree angle for bow "because arrow in position most readily."

### Arrows

1101-1111. One-piece (without head or foreshaft).

1101-1104, 1107. Materials, length, etc. EN hardwood, not barbed, 3 spans long. NT plant along creeks. ST batimota wood, also another wood. SC arm's length. WS Apache plume wood. Hu Apache plume, dogwood (?), 3d hardwood; sharpened point circular or square in transverse cross section. Me gooseberry, chokecherry, Apache plume; for fish; sometimes for war; sharpened point triangular or square in cross section. Li 3 kinds of wood; sharpened point circular, triangular, or square in cross section. Ll chokecherry wood; willow also, but too soft. Ol chokecherry wood. SU hardwood shrub, not greasewood. Wa sumac, sinew wrapped near tip to prevent splitting or pulling from wound; also plant resembling cat's-claw bush; for deer and smaller animals. Zu same wood (wimatam'a) as bow. SA wood from mts., resembles willow. SI wild plum, wild cherry, and 3d species.

1105. Multiple-pointed arrow. WN (4), Zu (2).

1106. Arrows with cross sticks for birds listed under 1106 were one-piece arrows. 4 cross sticks (EN, NT, ST, SC, Ci, WM, WS, Hu, Me, Li, Ll, SU), 2 (EN), 3 (Wa), 1 (SI). Also on foreshafted arrows (1117): 4 (EN, NT, ST, SC, Ci, WM, WS, Hu, Me, Li), 1 (SI).

1112. Arrow with head, no foreshaft. Ci, WM hardwood arrow, stone head, for war more than cane arrow; Ci ash wood. Li deer arrow sometimes mescal stalk with stone head; to compress and harden mescal stalk forced through perforations in juniper-wood arrow wrench (1162).

1115-1117. Foreshafted arrows. NT foreshaft shrub, fastened in cane shaft with shrub gum or piñon pitch, sinew wrapping. WS cattail foreshaft for boy's arrow. Me cane, cattail, or mescal-like stalk foreshaft for boy's arrow. KP hardwood foreshaft set in young Spanish-bayonet yucca flower stalk; no cane in desert or near water holes.

1116. Ci cane from 10 mi. S of Black r., harder and better quality than on Cibecue creek.

1117. Arrow with hardwood foreshaft, no head. EN cane shaft, hardwood foreshaft, 3 feathers; for boys only; useless for deer. Ci for rats, rabbits, birds. SU cane arrow, greasewood foreshaft, no head, for practice; no cane arrow for deer. SA cane arrow with pointed hardwood foreshaft, for practice, small game, antelope, deer; buffalo killed with stone-headed arrow. HP sometimes yucca stalk with mesquite foreshaft.

1119. Arrow with thick blunt end for birds, rabbits, etc. Of solid wood, no foreshaft (WN, SU, Wa, SA, SI). Wa, SA, SI maize cob on end for stunning birds. SI no maize cob on cane arrow. KP only blunt-ended, greasewood-foreshafted arrow for rabbits (cottontail, jack), not birds.

1120. Foreshafted headless arrow for practice. EN, SC, SU, SA, SI. ST boys only. Wa toy cane arrows for boys; no foreshaft or head.

1121. Rills on arrowshaft. Ci certain men grooved distal half; purpose (?). WS 3 rills. Ll rill and grooved zigzag (1124) made by drawing arrow over sharp point of rock, nowadays metal. SU zigzag (1124) groove for ornament and bleeding; by man who understood, although each made own arrows otherwise. Wa straight groove near tip, becoming zigzag (1124) lower down; made with sharp fragment of flint set between 2 bits of wood over which arrow drawn; for shooting straight, not increasing bleeding. SA grooved lightning (1124) design on self arrow, not cane arrow; painted red; made with sharp stone or tooth.

1122. Arrowshaft painted on feathered part. NT blue and red applied with string dipped in pigment and looped around arrow which revolved on knee. ST black and red encircling bands on yellow ground color. Ci red and black. WM black band on cane arrow at base, red band adjoining; red clay with piñon gum. Wa arrow base yellow with oak-bark juice, followed by red band of piñon-bark juice, blue band of indigo (from Rio Grande Pueblos); toasted to make colors fast. SI one-piece and cane arrows.

1123. Pyrographic design on arrow by negative patterning. WS, Hu, Li reserved portions from burning by wrapping with green yucca-leaf strips. WS burned diamond design. Hu zigzag lightning (1124) design (sometimes on foreshaft also).

1124. Lightning design on arrowshaft. See note 1121, 1123. On 1-piece arrow only (EN, SI). EN lightning and rainbow incised on 2 sides, as "poison." SI incised with obsidian. Me foreshafted arrow.

### Arrowheads.—

1125. Stone arrowheads. Found, not made by WN, Wa, Zu. WN shamans used for cutting medicine; iron arrowheads on arrow in informant's time. NT, ST white quartz, white chert (?), black obsidian. Li flint. SA hammered out barrel-hoop iron arrowheads in late times; buffalo formerly killed with white "flint." KP I saw one of schistose stone. HP for big game.

1126. Ll flint points scarce, "so used bone arrowheads," from any animal of satisfactory size; ground to shape on stone.

1127. SC only claimed arrowhead with tanged base, hunt and war. Me not used because split foreshaft.

1128. Stemmed-base arrowheads for war and hunt, SC, Ci, WM, WS, Hu, Me, Li, Ll, Ol, KP; war Wa, SA. Ol base roughened to hold better.

1130. Arrowheads with side-notched base for war and hunt, ST, WS, Hu, Me, Li, Zu, SI; war Wa. ST informant one black obsidian.

1131. Arrowhead with convex base for war and hunt, WM; hunt SA.

1132. Serrate-sided arrowhead for war and hunt, ST, Zu, SI, KP. NT hunt only, especially deer, bear; "lacerates animal inside and brings speedy end."

1133. Arrowhead detachable for war and hunt, ST, WM; hunt SA; war SI.

#### Arrow feathering.—

1136. KP 4 half feathers sometimes; only group sometimes to place feathers spirally on arrow.

1138. Tangential, double feathering. ST owl feathers on boy's arrows. Me sparrow and sparrowhawk feathers on boy's. Ll boy's. Wa eagle-down feathers tangentially on first arrows only given baby boy. SI toy arrows; sometimes twisted rabbit fur instead.

1139. Adhesive, besides sinew wrapping, for attaching feathers to arrow. Piñon pitch (WN, Ci, SU); pitch, species not designated (Hu, Ll); paint (EN); cactus juice (Hu); Spanish bayonet yucca-leaf sap (SA); hide glue, sometimes (SI); Wa wound proximal end of feather first, then moistened so would not buckle, then lashed distal end.

1140-1143. Feathers used on arrows. See note 1138. EN turkey, crow, owl on boy's cane arrows. SC dove, quail, crow on boy's. Hu also road runner; owl not used, as bad dream or bad luck. Wa owl feathers on hunting arrows. Zu feathers of any large bird, even owl; boy's arrows radially feathered. KP red-tailed hawk. Rarer arrow feathers: owl (WN, EN, ST, Wa, Zu), turkey vulture (Me, Li, Zu, HP).

#### Arrow "poisoning."—

1144. EN poisons blue and red. Ci prepared secretly. Hu antidote for red-ant arrow poison. Groups marked plus in 1144 and minus in 1145 also used "poisoned" arrows for hunting.

1146-1150. Composition of arrow "poison." NT deer kidney into which introduced stingers of yellow jackets and other hymenoptera, scorpion poison. Buried at fireside 4 or 5 days. For use, rubbed down on stone and applied as paste. ST introduced juice of mashed shrub and spruce leaves into deer kidney, hung in tree 2 days to rot; rubbed down on stone. SC mixed in basket; liver, kidney, stingers of yellow jackets, any bitter plant, mescal juice, etc.; kept as dried lump; arrowhead rubbed in it. WM spleen and plant substances.

1148. KP, HP jack-rabbit blood, HP deer blood. KP jack-rabbit blood "prevented wounded deer going far."

1150. Zu red ant (?) abayanisa tonye (Navaho's partner); crushed on arrowhead to give success in killing deer.

#### Arrow release.—

1153. Mediterranean release. Me boys only. SA most effective release, used in war, sometimes for game.

1154. Hide wristguard. ST deer rawhide. Ci projection of recurved hard leather on wristguard to catch bowstring. SA rawhide. KP buckskin.

#### Arrow straightening and smoothing.—

1155-1157. Straightening with hands and teeth. ST one-piece arrow, foreshaft of cane arrows, but not cane shaft, with teeth. Me one-piece arrow warmed over fire for teeth straightening. SU, SI cane arrow heated in ashes, bent by hand. KP arrowweed arrow warmed, straightened with teeth.

1158-1160. Stone arrow straightener with groove. EN cane arrow bent on warmed ungrooved stone. ST steatite, flat base. WM only stone straightener with 2 transverse grooves, used when portion to be bent short, when long used longitudinally grooved straightener; pottery straightener (1161) with one transverse groove. Hu greased at point to be bent before placing in heated straightener. Me found, not made; usually flat pebble or potsherd warmed and cane arrow bent over it. Li steatite.

1162. Wooden arrow wrench perforated. Li drilled with small flint held in fingers (971). KP mesquite wood, for compressing wood of yucca-stalk arrow after straightening.

1163-1168. Horn or bone arrow wrench, perforated. Of deer shoulder blade or horn (EN, Zu); all other groups horn only. WN holes in mt.-sheep horn bored with iron tool. EN purpose to compress and harden wood, so impervious to moisture. ST antelope-horn wrench bored with flint point held in fingers; to hold cane shaft while fitting foreshaft; cane in wrench so upper edge slightly below edge of tool, which slightly heated so as not to chill pitch; pitch poured in, foreshaft forced into place. Ci mt.-sheep horn for wrench obtained by trade. Wa willow stick to bore horn, burning through by friction; holes of different sizes. Zu tip of old-deer horn ground down till opening appeared. SI to make wood hard, not to straighten.

1169. Two-piece grooved-stone arrow polisher. Hu lacked, but smoothed arrow with bits of sandstone held in hand. Li women sometimes helped smooth arrows. Zu one grooved polisher instead of two.

#### Quivers

1170. Cased skin quiver. SC coyote. Zu fawn.

1171-1176. Open skinned, sewn. WN "tiger," nashdusio, skin, yellowish, not spotted. EN beaver. NT, ST mt.-lion tail left on quiver. ST

cut tail open, painted skin side yellow. ST quiver from rectangular piece of hide, hair on; folded, edges sewed together with buckskin; piece of hide left over used for bottom; stick sewed along one side for rigidity; quiver slightly greater diameter at top. WS horse, burro, antelope, mt. sheep. Me calf, colt, young buffalo, fawn, de-haired deerskin. Li buffalo, buffalo calf, horse. Ll 20 arrows carried in quiver, which sometimes of buffalo hide. SU fawn. Wa beaver, from Little Colorado r. near Winslow. SA calf.

1177. Separate compartment in quiver for bow. NT, ST buckskin partition sewed in mt.-lion-skin quiver. Me bow compartment extended above and below adjoining arrow compartment. WA stick sewed in quiver at junction of bow and arrow compartments; fringe on side of bow compartment.

1179. Quiver at side, under arm, in battle. WN on horseback in warfare. Hu swung down to hip for easy arrow seizure, or hoisted higher on back to pull arrows over shoulder. Me lowered to hip so arrows easily seized; 2 or 3 arrows held in bow hand. Ll at side on horseback. Wa quiver so arrows available at side; also small quiver of arrows only for attachment to belt (1182). SI bandoleer strap over right shoulder; in action swung so arrows pulled out at waist level, quiver then being in nearly horizontal position.

1180. Quiver on back instead of side during battle: EN, NT, ST, SC, Ci, WM, WS, Hu (sometimes), Ll (sometimes), Ol (sometimes), SU. EN pulled arrows over shoulder from quiver in hunt and war. Ci in war, quiver higher on back by tightening carrying strap, to get arrows quicker. WM, WS hoisted high on back so arrows readily pulled over shoulder; WM special belt around waist to hold quiver up in position. Ll on foot in warfare pulled arrow over shoulder. SU quiver swung down so arrows pulled out along side upper arm instead of over shoulder. SA in action fastened to belt at side like SI (1182); otherwise on back.

1182. Belt to carry quiver. ST from belt temporarily. KP special belt around waist, no bandoleer; bow always in hand.

### Spears

1183. Spear wholly of wood. NT one-piece, sotol stalk sharpened to point, war only; tied to wrist with cord. SC one-piece, ash wood, 8 ft. long. SA one-piece, oak, tip ground down on rock like pencil point, war only; second one-piece type with flat, pointed head ground to two knife edges, for horseman to stab buffalo in shoulder or back where sinew, to cripple, dispatched with arrows later.

1184. All-wood spear with inserted hardwood blade. EN flat, 2-edged blade; deer in pitfall killed. Ci spear of sotol stalk with inserted hardwood, 2-edged blade lashed in place with sinew; for bear killing and war; warriors brandished in assent to war plan at council; in battle warrior kicked spear along while using bow; when

close to enemy used spear; no spear-kicking race for practice. Hu sotol-stalk spear with inserted hardwood point. Me barberry-wood blade in walnut- or locust-wood handle.

1185. Feather-decorated spears. Hu feathers had protective power.

1187. Me war leaders with feathered spears clashed first with enemy if fight in open; only brave man used, who had to stay in lead either afoot or horseback. Ol man with feathered spear led in battle.

1188. Stone-pointed spear. Zu spear of same wood as bow, head of black obsidian which ground on hard rock after roughly flaking. SI obsidian spearhead sharp on both edges, foot long.

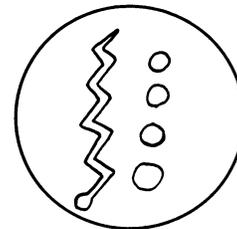
1190. WS spear to dispatch wounded animal sometimes; no animal hunted with spear alone.

1193. Iron-bladed spear. ST "no spear formerly, because no iron"; painted tip of sotol stalk black to imitate iron-pointed spears of neighbors, but only as toy; later iron from Navaho and made spears. Ol no spear till iron for blade.

### Shields

1194. SC circular pad of mesal fiber, 20 in. diameter.

1195 -1200. Circular shield, rawhide, made locally. WN horse, cattle; crow or other large feather decorations. EN elk neck skin staked out to dry, permanent buckskin cover on front, red and black, but no realistic design; eagle and "yellow-tailed" hawk feather attached, helped to conceal shield bearer. ST only after cattle raids; handle of buckskin; crow feathers around edge; snake and Big Dipper star design (see fig.) painted in white, supposed to make bullet proof. Ci shield bearer led in battle, must not run away.



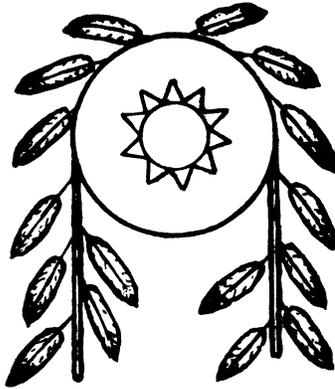
WM cattle hide after whites came. WS bull neck hide. Hu cattle hide; design of eagle or mammal, sun or star, in charcoal, yellow clay, white clay; sometimes 4 long feathers and some white downy feathers attached. Me plain buckskin cover, removed in battle; mt. lion, bear, or eagle painted on permanent covering of buckskin to edges of which feathers attached. Li star, moon, sun, lightning painted on shield; bear-fur decoration. Ll buffalo hide hardened over fire; cover of antelope buckskin, feathers attached, painted designs at four "corners" representing buffalo, buffalo head, sun, half moon; "decorative only, no supernatural efficacy." Ol rawhide hardened by drying; eagle feathers on 4 "corners" of shield; sometimes mammal or bird picture painted; neither

feathers nor painting dictated by dream or shaman. SU buffalo-hide shields late, when fighting Plains tribes and Navaho; painted black, red, yellow. Zu double cowhide, buffalo hide by trade; sun design encircled by various colors. SA buffalo head painted on shield. SI human figure with arms outspread, representing enemy, in black or red. KP 3 layers of deer rawhide, wooden handle; painted design of spread eagle; hawk and eagle feathers; shield bearers usually lead in battle.

1198. Painted shields of uncertain design: WN, Ci, SU.

1199. Shield cover cloth only, ST, Zu; all others hide only.

1200. Eagle feathers, most popular for shield decoration: EN, Ci, WM (see fig.), WS, Hu, Me, Li, Ll, Ol, Zu, SA, SI, KP. Nonflight obligations of shield bearer affirmed by Ci, doubtfully by Ol, KP; others doubtful or denied.



Armor

1202. War cap of buckskin and feathers. See 1382, 2711. Not armor, strictly speaking. EN buckskin war cap with owl feathers; any warrior wore. ST eagle feathers on war cap; another type, ornamental, had turkey-feather bunch on top, from which projected two white eagle-tail feathers. Hu buckskin skull cap with eagle down on top. Ll buckskin or buffalo-skin skull cap completely covered with feathers or rabbit fur; not helmet; not war bonnet. Zu owl feathers on it; served to hold bangs back. KP completely covered with eagle and hawk feathers.

1203. Short war bonnet, Plains type. Ol tail piece modern.

1204. Armor of hide. SC hide tunic, open at neck. WM painted buckskin shirt for bullet protection, made by shaman; none for arrows earlier; could not learn if Ghost Dance manifestation. WS similar coat made and prayed over by shaman, for bullet protection; said to be ancient, not Ghost Dance; wearer used only spear and shield. Me six-ply buckskin, record for Me only; painted medicine war shirt worn by some. SA 1 thickness buckskin. SI heavy buckskin or buffalo hide.

1205. KP broad belt of buckskin wound two or three times around belly for arrow protection.

### Clubs, etc.

1206. Grooved ax or hammer as club, rawhide lashing in groove. Me, SI prehistoric grooved-stone ax as weapon sometimes; Me also encased grooved-stone ax and wooden handle in skin from buffalo tail. Wa not true ax, but stone pointed at both ends; grooved for rawhide hafting.

1207. Club of stone and stick encased in rawhide. WN ancient-type club. SC, WS carried by buckskin wrist loop. WM typical Plains club with flail hafting, carried in belt for dispatching wounded enemy or deer; ordinarily fought with arrows. Me encased in hide from buffalo's tail; see 1206.

1209-1213. Boomerang (curved throwing club). Oak: SU, Wa, SA, SI. SU ground down on rock; thrown so legs of dog or rabbit cut off; occasionally used vs. man. Thrown by foot hunter usually; thrown from horseback, describes curve, skims along ground; horses rare in old times. Wa threw at distant rabbit, close up plain stick (1214). In war at enemy's arm or head. Zu probably barberry and oak; sometimes killed mourning doves. SA cottonwood sometimes; oak preferred, because not apt to break if struck rock; several carried in belt.

1214. Straight throwing stick for rabbits, etc. WM occasional stick, more frequently stone. KP for rabbits and other small mammals, and hurling into bird flock; not for deer.

1215-1217. Ball-ended club. EN from root knob. NT 3 ft. long, not thrown. SA, SI threw at small game and dispatched wounded large game. SA also for rabbit hunt from horseback, leaning over and striking as with polo club.

1218. Feathered crook for neck of enemy. Li hooked by neck, drew close to club; also crook served as flag.

1219-1223. Slings. WN for foxes, rabbits, etc. NT of yucca-leaf fiber. WS boys killed rabbits, small birds, etc. SU acquired in late wars with Navaho and Plains tribes. KP slung stones in guarding crop.

### BEADS AND ORNAMENTS

Four Pueblo groups were principal manufacturers of beads; they alone made shell-disk beads. The nonmanufacture of shell beads by all groups except Pueblo again bespeaks the Southwestern lack of technical skill. Thus 15 of 19 groups were dependent for their shell beads upon the handiwork of either ancient or modern Pueblo dwellers. WN said beads in 4 colors: white shell, blue turquoise, red stone, black stone (jet, cannel coal); denied directional associations.

1224-1232. Shell-disk beads. WN shamans had most, from Zuni. EN from Pueblos already drilled; 1 buckskin or blanket for 3 18-inch strings of Olivella beads. ST shaman gave 1 buckskin for 2 or 3 clam-disk beads from ruins on account supernatural potency; after rain ST searched for them in ruins, kept for good luck or traded to shaman. WM shell objects from ruins except Haliotis (1239); some white shell beads from Navaho, who

came to WM country; WM gave 1 slab of dried mes-cal for 6-inch string of beads. Shell, turquoise, and jet beads from ruins, used for necklace but not ear ornament; piece found without drill hole left that way as WM had no means of boring. Hu beads from old sites ("ruins") Huachuca mts. after rains; strung on buckskin strip and worn as bracelet; informant heard of Inde<sup>n</sup>dai man who went to Gulf of California and brought back shells long before informant's birth. Me few people had and all found at ancient sites; so rare that one only might be worn on necklace. Ll no beads of any sort from ruins; shell beads from Navaho only since Ll on present reservation; Taos and Picuris, closest Pueblo neighbors, said not to have had shell-disk beads formerly. Ol never used beads from ruins on account of dead; all from Navaho and Pueblo in exchange for buckskins, moccasins, etc., but not horses as too valuable. SU no shell beads or pendants before Caucasian contact. Wa rough disk shell beads already drilled, from Havasupai; Wa ground to finish; string length standard, around neck down to umbilicus; 1 blanket or 1 blue woolen shirt traded for string of rough disk beads. Zu Olivella- or clamshell-bead string from chest center to thumb and index finger of outstretched arm was standard measure for necklace; worth 1 Hopi manta for dress if beads well made; or traded such measure to Navaho for 10 head of sheep or 1 buckskin. Clamshell beads common formerly; now more Olivella; both from W. Strung on woolen thread. SA Olivella-bead-string measure virtually same as Wa; SA doubled string reached from shoulder blade over shoulder to umbilicus; 4 such worth 1 horse or cow; Olivella beads with turquoise sometimes worn as ear pendant (1232). SI necklace of Olivella disks traded Navaho for 4 x 6-foot rug, necklace of turquoise-disk beads for 1 horse. Measure from shoulder to sternum tip to other shoulder. KP shell ornaments beach-worn shells, often already perforated by predatory mollusks. Occasionally, a piece beach-worn to proper shape perforated with flint drill held in fingers. Rarely, shell picked up at some old site in Papago country. No disk beads or cylinders (1233) made or found. If enough shells accumulated, strung on mesal-fiber string, or buckskin strip, for woman only to wear.

1233. Cylindrical shell beads in necklaces (NT, Zu, SI), in bracelets (EN, Zu). EN sometimes found in ruins; 2 or 3 strung to form bracelet. NT about 1 in. long. SI cylinder with transverse perforation at one end, worn as pendant on necklace.

1234. WM sometimes found shell-ring bracelet in ruins, did not wear. Zu made, girls wore. One WM man making silver bracelets in 1935; let none watch him; children crying near him would spoil work.

1235-1239. Whole shells found in ruins, etc., not used (Ci, Hu, Me, Li). Found in ruins and used (SC, Zu, KP). By trade from Mexicans (EN,

Ll, Zu, SA, SI). By trade from Pueblo (EN, Zu). By trade from W (Zu, SI). EN Olivella and Conus from ruins; clamshells from Pueblo sewed on shoulders of woman's tunic. ST white shell ear pendants for women; white clamshells with purple near hinge, probably Chione, and clamshell beads and pendants, found in ruins; ST rarely made. SC war parties sometimes brought shells "from Gulf of California": Conus, Pecten, Chione, etc., but especially Haliotis; clamshell pendant worth 1 buckskin. Li whole Olivella as ear pendant. SA necklace of whole Olivella, also other small univalves; small clam valves bored in 2 places for necklace pendants; shells from traders in Santa Fé. SI Olivella with tip of spire ground off, for necklaces and buckskin-shirt fringe.

1239. Haliotis-shell pendants. WS shell from Mexicans, Spaniards, and tribes to W. Pendants ground on sandstone slab for ears, necklace, hair; use ancient. Hu shell from Spaniards first, from Navaho after Hu to San Carlos reservation; Hu made pendants. Me girl's ear pendant (1242) of bone tube with triangular piece of Haliotis suspended (see fig.). Li from Mexicans, ground on sandstone for necklace pendant, drilled with flint in fingers. Ol shell from San Juan and SI pueblos for buckskins; worked like Li; ear pendants before Navaho silver earrings. Wa whole shell from Havasupai for 1 blue woolen breechelout or 1 pair of black knitted woolen socks.



1240. Haliotis inlay. Wa turquoise ear ornaments for girls in ceremonies; pitch-pine (1273) adhesive. Animal clamshell gorget sometimes made by Zu.

1241. Red shell beads imported by Me, Ll, Ol, Wa. Me buckskins for red shell beads brought by Pueblo traders from Santo Domingo and Isleta (del Norte), who visited Me with donkey caravan. Ll from Pueblo who got from Navaho. Wa imported coral-red shell beads. Zu, SI red shell beads from outer portion of Haliotis shells.

1242. Bone beads. NT necklace of triangular beads of tortoise shell, worn by old woman; strung flat with apices alternately up and down:  $\triangle \nabla \triangle \nabla \triangle$ . NT inch-long beads from wildcat fibulae, for woman's necklace. Zu beads from deer bones, from cattle and horse bones latterly.

1243. Bone breast ornament of Plains type, imported. Li from Tonkawa, Comanche (often enemies), Mexicans; men wore; no buffalo-horn headdresses.

1244. NT wooden stick in septum perforation for month, to prevent hole healing over.

1245-1250. Feathers as ornaments. EN turkey beard pendant (1250) by shaman. SC eagle-quill beads with Mexican glass beads. WM eagle-feather (1 or 2) charm (2921) or ornament on tunic (nowadays hat, too). Sometimes 1 or 2 turquoise beads with them. Me, Li soft long eagle feather in man's hair. Li adolescent girl 2 in hair. Ll eagle feather on 1 of man's hair braids, either side; women not. Ol eagle feather only hair pendant

(1349); no shell or turquoise. SU sometimes man single feather in hair; no war bonnet or feather headdress formerly. No feather on string on neck; only rabbit-bone whistle or arrow point so worn. Wa young boy had white feather tied to hair. Zu feather in bored nasal septum (1364) by certain priest. SA eagle-down, wing, or tail feather in hair at fiestas. KP eagle or hawk-down feather on buckskin cord around neck, or on each wrist for charm; see 2920-2922.

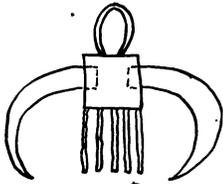
1251. Seed beads. Mountain-laurel-seed bandoleer (Li), bracelet (Me), earring (Me, Li). Juniper-seed necklace (EN, SU, Wa), boys only (SU). Maize grains worn in dance (Zu). EN juniper-seed beads only kind made in early times; ground down at one end till opening appeared, other end with natural opening; threaded with sinew (SU). Wa juniper-seed necklace ceremonially. Li man's bandoleer ornament of mt.-laurel seeds on buckskin string. KP woman's necklace of green seeds in summer rainy season; fell to pieces in ten days.

1252. Mt.-lion-claw pendant. Zu claws as necklace pendants in society ritual.

1253. Bear-claw necklace (WN, ST, Me, Li, Zu). Single-claw pendant (Ci, WM, Me, Li, Zu, SA). SA imported. ST bear's canine-teeth and claw necklace. Li 2 or 4 claws pendent on necklace; no complete necklace. Zu bear's claws for necklace and pendants in society ritual. SA bear claws on shirts obtained from Comanche and other Plains tribes.

1254. Ol men or women badger-claw necklace. Wa snake priests badger-paw necklace.

1255. Eagle-claw necklace (Me); 2-claw pendant (WM) (see fig.).



1257. Antelope-dewclaw necklace for boys (Wa), deer-dewclaw necklace (WM), deer-dewclaw pendant (Ci, Hu, Li, SU), man's deer-dewclaw bracelet (SA). Ci pendant for girls and women. WM pendant of 4 for baby; perforated with burning stick. Hu 2 or 3 tied to woman's dress; no full fringe; perforated with spine. Li on children's moccasins or dress; perforated with awl. SU girls' before-puberty buckskin dress with 2 to 6 dewclaws separately placed.

1258. Wildcat-claw bracelet (Ci, Zu), pendant (Ll, Zu). Ci men wore. Zu bracelet for society ritual; necklace for boys.

1260. Turquoise. WN objects found, not made; or imported from Zuni; far more used now than in informant's boyhood. Ci found in ruins. Hu after moved to San Carlos reservation got from Navaho. Ol ornaments ready-made from Pueblo and Navaho. SU none used. Zu from E; never allowed to dig themselves, but raw or worked from San Felipe pueblo for woven mantas. SA, SI from Los Cerillos turquoise mine at Bonanza, close to pres-

ent Santa Fé and Albuquerque highway; no one pueblo owned, SA, SI, Cochiti, San Felipe, etc., mined there.

1261, 1262. Turquoise ornaments found ready-made, or imported. See 1260. EN disk beads from Pueblo; only pendants made. ST all stone beads found, not made; except occasional drilling of turquoise disk. WM found or imported from Navaho disk beads and pendants; if found unperforated turquoise did not know how to drill, so notched and tied with sinew for pendant.

1263. Turquoise-disk beads for bracelets (EN, Me, SA, SI).

1264. Turquoise pendants from nose by NT only; from ears by WN, EN, Ol, Wa, Zu, SA, SI, and probably others. Ol, before silver earrings from Navaho in exchange for beaded moccasins, used turquoise and Haliotis ear pendants from Pueblo and Mexicans.

1265. SA mosaic turquoise inlay with yucca gum on Pecten shell; also on jet.

1266. Red stone disk beads and pendants found, not made, by NT, SC, WS, Me, Li. Me also imported. Zu red stone from outcrop near Ojo Caliente. SA went to Galisteo for it; also made disk beads from white stone. WM found beads of white stone; red glass beads from Mexicans, but no red stone beads.

1267. Ci yellow stone beads in ruins. Zu used any pleasing stone.

1268. Ancient jet beads found and used by EN, NT, SC, Ci, WM, WS, Hu, Me, Li, Wa, Zu. Sometimes from other tribes by EN, Zu. Ol got from Pueblo and Navaho. Made by Zu, SA, SI. Disk beads of other stones (SC, Ci, WM, Li, Zu, SA, SI). SA jet beads for bracelets, earrings, necklaces; mined in deposit called Kihane by Navaho, W of SA, E of Zu. SI from mine near Acoma; informant declared not coal.

1269. Porcupine-quill embroidery on buckskin. EN quills not dyed. Wa men's dance moccasins; undyed quills sewed with horsehair. SI dyed red, yellow, green, black. KP never killed lest killer sicken.

#### ADHESIVES AND PIGMENTS

##### Adhesives.—

1270-1273. From vegetable sources.

1270. Yucca juice. Me Spanish bayonet yucca juice as adhesive, but poor. Zu yucca fruit heated, juice as adhesive; also wheat-flour paste. SA adhesive from leaf, not fruit, of Spanish bayonet yucca.

1271. Mesquite gum. Me on arrows.

1272, 1273. Conifer pitch. SA used, not as good as yucca sap.

1273. Other pitch or gum, from shrub branches (NT, Ci, Hu, Me, KP, HP). NT fastened arrow fore-shaft. Hu cactus juice. KP greasewood gum and gum from branches of another shrub; greasewood gum to seal pottery lid on storage pot of acorns. HP greasewood gum, also clay, for sealing food storage pots.

1274-1276. Adhesives from animal sources. WN, EN, Ol horsehide boiled. Li hide, hoofs, horns boiled together. Ll forehead skin of buffalo boiled, also hoofs separately. Ol buffalo-hoof glue. SU

deer-horn glue. Wa horse-hoof glue; not buffalo. Zu honey, not wax, as adhesive. SI buffalo hide heated, then boiled for day, producing brown glue.

Pigments.—

1279. Red mineral pigment. Yellow clay, red when fired: Me, SA, SI (as pottery pigment). WM red paint from Black r. Wa from Havasupai. SI brick-red face paint from "Hopi country"; also red face paint made from close-grained mineral ground on rock.

1277, 1278. Containers for pigments. ST Abert's squirrelskin sack. SC buckskin sack. WM sack of fawnskin or Abert's squirrel skin. Me, Li also paint in river mussel shells. Ll pigments wrapped in buckskin, secured by bringing corners together and tying. Ol buckskin sack tied at top. Wa, SA sack of thin buckskin for body paint; small pot for pottery pigments.

1280. Red from boiled alder bark. WN applied to moccasin with maize cob. ST applied to moccasins.

1281. Red from plant other than alder. WN grease on face, then red pigment from shrub root; for baby face and adult. EN from oak balls for face paint, also from root. WS tuna-juice face paint by young people. Hu, Me, Li from oak bark. Me from oak bark or Spanish bayonet yucca for staining rawhide bag; red from berries for arrow paint. Li carmine from cochineal on Opuntia leaf. Ol mt. mahogany boiled for dye for basketry materials. SU dye from plant root for basketry material, juniper-foliage ashes for mordant. Wa whole plant boiled for wool dye. Zu from mt.-mahogany (?) bark for dyeing moccasins and basketry material. SA purple dye by boiling purplish maize husks, used on buckskin; pink from boiled shrub for coloring dance regalia. Oak balls not used by Wa, Zu, SA, SI, KP.

1283. Wa orange dye by boiling dried flowers.

1284. SC mineral green only; Hu, Zu, SA green and blue. EN shaman had blue mineral pigment for sand painting. ST blue mineral from spring at Indian Garden, Arizona; for arrowshaft sometimes. SA blue mineral pigment for pottery or face, green mineral from Jemez region.

1285. Blue or green pigment from plants. Blue from sunflower seeds or imported indigo, Wa; from small plant leaves, EN (shaman used), SA. Bluish green from leaves of tree high in mountains, SC. Green from leaves of small plant, Me, SU, SA. Me green on rawhide bag or arrow; SU for moccasins.

1286. Wa, SA used clay and a second white mineral. SA alkaline mineral for whitening wool, white lime rock calcined for plaster.

1288. Yellow from barberry bark. EN, Wa yellow from leaves of unidentified plant which boiled with salt or other alkali; not for wool dyeing. WS besides yellow from barberry, 3 shades from oak bark. Ol barberry bark boiled.

1290. Yellow pollen, religious use only. EN maize and tule pollens ceremonially. WM, KP face

paint for ceremonial dances. Wa prayer offerings only, not pigment. Zu various pollens used.

1291. Black mineral pigments. Probably galena, NT; shining iron pyrites, WM, Ll, Ol, KP; probably manganese oxide, NT, ST, SC, WM; haematite, ST, SC, Ci, WS, Wa, SA. Haematite called lesgi' by ST, SC; latter used for black and red pigments. Li mixed black mineral pigment with yucca juice. SU, Wa black mineral pigment by boiling red and yellow earth pigments together, no ashes added. Wa minerals from just above coal deposit boiled with piñon pitch, sunflower seeds, gum from certain bushes, as black dye for wool. Zu black and brownish mineral pigments for pottery. KP mineral brown as well as black.

1292. Charcoal for black, sometimes by charring greasewood gum (WN, EN, SC).

1293. WS soaked walnutskins in wooden bowl for stain for notched calendar stick (2250).

1294. Black from boiled plant. Wa note 1291. SA for buckskin. KP mesquite bark.

1295. Fat mixed with paint for face and body. NT face red, yellow horizontal stripes and white dots over red. ST face red, white dots applied with stick. SC face greasy enough for paint to adhere without fat, except red which mixed with fat for face and hair. Ci painted face for dance, not war; also when happy, as when wife's family calling. Ll body paint for relay race only. Ol fat or marrow on face, then pigment. All groups painted face, but only following body: WN, EN, ST, WM, Me, Li, Ll, SU, Wa, Zu, SA, SI, KP (HP not inquired about). Wa, SA painted body for dance ceremony only. KP no daily face paint for looks.

1296. Marrow mixed with paint for face and body. NT, Ll, Ol, Wa coated face with raw marrow to prevent chapping. WM marrow from deer lower-front legs on hair; if hind legs, leg ailment. Ll after marrow on face for chapping, paint applied if desired; marrow not mixed with paint. SA marrow hair dressing and foundation for face paint.

1298. Pigment applied to face with rag, etc. Zu sometimes rabbit fur. SA, SI sometimes buckskin, wool, or feather.

1299. Me painted with stick when 3 colors in lines on face. Painted when feeling happy, as well as for dance.

1299a. Negative patterning by scraping off paint. Scraped off with plain stick, Me, Ll, Ol, SI; with notched stick, Ci, WS, SI; with notched bone, ST, WM; with 4 lower incisors of fawn, Ci, WS; with bone, WM; with fingernails, Ci, Hu, Wa, SA. ST straight or zigzag parallel lines. Ci parallel lines usually zigzag. WM horizontal parallel zigzag lines in red paint with notched bone.

1300. Red paint, fat, etc., to prevent chapping. WM mixed paint with marrow. KP cooked mescal syrup on face. WN pine pitch to cure pimples.

1301, 1302. Besides paint to prevent sunburn, white paint on body in hot weather: EN, ST, Li, SU, Zu, SA, SI; denied by Ll, Ol, Wa, KP. NT white face paint against flies; no fat. If red

paint, which applied with fat, used, fat attracted flies. ST white paint on body for small flies. Li men sometimes only leggings and breechclout on hot day, painted body white. SU body decoration men only. Zu for mosquitoes. SA white clay on face and body for certain sickness. SI red as well as white paint in summer.

## HAIR, BODY MUTILATIONS, AND DRESS

Beard and Hair

1303-1307. Depilation of beard and eyebrows. WN only beards sometimes allowed to grow; inch-wide metal tweezers now for beard plucking. EN pitch on boy's face to remove hair, so not many when adult. Me moustache worn.

1306. Tweezers of split materials: bract from piñon cone (SI), pumpkin seed (SA), bone (Me), willow wood (Zu).

1307. Eyebrows plucked by both sexes. SA reported Taos practice. Me began 18 or 19 years old.

1308. Men's bangs to eyebrows. Wa threw away bangs trimmings; longer hair stored in house for artificial bangs for girls in ceremonies.

1310. Men's hair full length. Me tied on top head when sweating.

1311. Men's hair shoulder length. SI women sometimes; denied for women elsewhere.

1312. Men's hair loose at sides but cut mouth level. ST some deer hunters cut mouth level all around, so not apt to get in eyes. SA women also, sometimes; men wore loose in dances only. KP trimmed at mouth level, thought to be Spanish influence.

1314-1319. Hair cut in mourning. WS old women cut hair shorter than young. Hu young women shoulder length, middle-aged mouth level, old cropped close, for near relative; young men cut a little, older men to mouth level. Me young women cut off 2 or 3 in., middle-aged to middle of back, aged to mouth level; old men only cut, young men dispensed with braid and beaver-fur wrapping for few days, keeping only hair tie at back of neck. Li women like Me. SU both sexes docked slightly.

1320-1323. Cutting hair. EN sometimes cut short after long illness. NT someone cut mourner's hair with stone knife, holding taut and sawing. Hu informant knew only iron implements. Me tied hair to cut with flint. Zu hair singed with maize cob. KP informant knew only metal scissors.

1324-1342. Coiffure.

1325, 1328. Zu married and unmarried women.

1326. One tie at back of neck. ST sometimes both sexes. Ci buckskin strip when going to war.

1328. Hair twisted, tied in bundle on back. Women only (Zu, SI), both sexes (SA). NT men sometimes twisted turban-like on top of head, tying with buckskin (1348). KP women likewise sometimes, without buckskin tie.

1330, 1331. Men's hair in folded club, wrapped and hung over neck. (1) Navaho style in which

club wrapped in middle only, WN, EN, Wa, SA; (2) Pueblo style in which club nearly completely covered, Zu, SI, KP, and according to SA informant, pueblos of Jemez, Isleta, and Sandia. Precise style club of NT, WS not recorded. WS on hunt or warpath only. Wa, SA like Navaho men, but tied middle with red woven hair tie. KP folded club wrapped with buckskin; for late style see note 1312.

1332. Girl's hair in folded club, tied in middle (Navaho style). WM until marriage only. Me strip of antelope fawnskin. Li buckskin or fawn-skin strips.

1333. Women's hair club like man's, WN, EN, SA.

1335. Girl's hair in 1 braid: NT, SC, Ci, Me, Li, no others. Adult women likewise sometimes: ST, SC; regularly among Ci, Me, Li, but no others. SU braid nowadays, not formerly.

1336. Hair in 2 braids, women. Hu girls' braids of side hair to prevent hanging over eyes; combined with club arrangement on back of head (1332). Ll, Ol both sexes, all ages wore 2 braids, but only men wrapped. KP married and unmarried women.

1337. Men's hair braids wrapped with fur or buckskin. Me, Li sometimes men wore 3d braid, scalp lock. Li wrapped with otter or beaver fur; feather on scalp-lock braid, either top or bottom. Ll, Ol wrapped with buckskin strips.

1338. Men's hair rolls wrapped with fur or buckskin. Me, Li men wore 2 rolls of hair, Me women 1. Me men's roll wrapped with beaver, Li with otter or beaver fur. Sometimes rolled for short distance from head and loose below.

1339. Men tie hair club with yarn. SA women also.

1342. Married women's hair in long wrapped roll. One at Zu, SI; 2 at Wa.

1344-1346. Men's headbands. WN of wildcat or "tiger" fur. EN bear or wildcat fur. ST, SC yucca leaf, not woven; ST said buckskin unsatisfactory, because "too hot" when perspiring; SC in hot weather, passed headband under back hair to lift off neck and give ventilation. Ci silk-handkerchief headband in informant's boyhood. WS only calico or other commercial-cloth headband. Ol porcupine-quill embroidered headbands by both sexes on festive occasions. Wa of wildcat, mt. lion, fox, beaver fur. SA woolen, fur, or buckskin headband by men for dancing only, but now daily; sometimes of wildcat fur. SI of pine squirrelskin with tail hanging on one side. KP of buckskin or white cotton cloth; worn with club coiffure.

1347. Woven-band hair (club) tie by men only, Wa.

1348. Me also antelope fawnskin hair ties. Buckskin hair tie by men only, SA, KP. Zu no buckskin hair tie lest lose own hair.

1349. Pendants in hair. EN turquoise or other stone pendant in hair when shaman so directed. WS, Me Haliotis pendant in adolescent girl's forehead hair (2455). Me Haliotis pendants (6 or 7) on young man's hair where side braids tied to back braid, if shaman put them on him; feathers also worn pendent in men's hair. KP men only wore.

1350. Figure-8 ornament for girls. Of rawhide or buckskin, attached to Navaho-type hair club (1332). NT of buckskin from deer's neck; worn by little girl. WM became style only after whites came; red wool and brass buttons on face of ornament. WS silver buttons on face of ornament; ornament ancient. Li girls and married women.

1351. NT women flowers in hair in spring, when sometimes many people assembled for dance called kotetasishgis, "many people dance." SC yellow flowers, in dances. Ci in spring and summer. WM girls in spring "to look pretty." WS, Hu wreath worn by young woman. Me individual flowers and woven wreaths by girls; to keep rattlesnakes away both sexes put sage leaves in hair. KP women wore wreaths in spring.

1352. Birdskin tied on hair. WM on hair formerly, nowadays on shirt. Hu hummingbird, other small bird on young man's hair. Me hummingbird and small yellow bird on men's hair. EN denied use, but men wore bunch of turkey feathers on back of head.

#### Various Practices

1353. Special disposal of hair combings or cuttings. Thrown in river, SA; buried, KP; burned, EN, Ci (sometimes), Hu (sometimes), WM, Zu, SA, SI; put in brush, NT, ST, WS (sometimes), Hu (sometimes), Me, Li, SU; put under rock, SC, WS (sometimes), Hu (sometimes). EN burned outdoors; after bad dream pulled out and burned a few hairs lest illness and death. NT, ST hid in bushes, bundled so birds could not make nest. Ci afraid to put in bushes, for if birds or rats made nest, person went crazy. Hu combings, not cuttings, sometimes burned. Zu person recovered from illness singed off hair with maize cob to rid disease, spat on it, burned it; all combings and cuttings burned lest owner crazed by sorcerer putting on top of post and dancing.

1354. Yucca suds to kill head lice: WN, EN, ST, Wa, SA. Other methods: scouring with sand and water (SI), plastering hair against scalp with mountain-laurel foliage and marrow for 2 days (Me, Li). EN washed hair with yucca, rubbed in grease or marrow, shook out lice on hot stones in sweat house. NT after yucca hair wash brushed out lice (still living) with grass brush. Li yucca and bear-grass roots for detergent. Zu decoction of soaked willow bark for lice. SA decoction from brown weed growing along river for lice.

1355. Hair greased with fat or marrow. ST marrow to keep out lice. Hu shampooed with yucca before applying marrow. Me, Ol, Wa marrow, not fat.

1356. Zu 5 thin beveled willow sticks shoved through hair so they spread; squeezed together to kill lice. WN, EN denied, though recorded in EDN, p.170. WN killed with fingernails. EN saying: "If you have lice the day is short." KP grass brush only for lice.

#### Body Mutilations

1357-1363. Boring of ear lobes.

1357-1360. Sex and age. NT baby's ears pierced at fortnight; small sticks to keep open. SC only modern ear boring of males for turquoise pendant. Ci after whites. WM none anciently, because "nothing to wear." Me bored any age. Wa bored at 4 or 5 days. Zu professional male ear piercers operated on all babies; pollen (not maize) "antiseptic" against sore developing. SI at 5 years; in winter; ear lobe numbed with ice, pierced with smooth splinter from pine knot. KP occasional person ears bored; neither informant nor interpreter.

1361, 1362. Instruments for ear boring. Hardwood needle (WN, ST, Zu, SI), snakeweed stem (Me), mesquite spine (Hu, Li), cactus spine (Hu, Wa, SA, KP). Me warmed lobe with green sage leaves before piercing; snakeweed left in hole, turned daily. SA stick in ear while wound healing. KP barrel-cactus spine for boring.

1363. Multiple ear holes. Me male informant 5 holes in each ear, lowest in lobe, 4 in outer edge about 1/4-inch apart; men only had multiple holes; women one, in lobe. Li female informant 4 holes in outer edge of each ear, lowest in lobe; she said Comanche same. Zu some men multiple ear holes.

1364. Nasal septum bored. Zu priest of Sumawi society had septum bored, wore feather on certain occasions. Bored with bone awl at society gathering. Woman made loud banging noise at instant operator made perforation.

1365. Intentional head deformation. ST occipital deformation accidental. SC recognized as due to cradle, not intentional.

1366. Nose straightening. Manipulation of nose and often in addition thumb pressure on baby's palate beneath nose. First might be daily, but second only once few days after birth. Zu, KP denied pressure on palate, but nose squeezed frequently if too broad, to make high, narrow.

1367-1374. Tattoo. WS, Hu, Me, Li, KP claimed ancient; SU modern.

1367. Forehead tattoo: WS, Hu, Me. Arm tattoo: WS, Hu, Me, Li. Eyelid: KP tattooed line along lower lid to edge of orbit. Hu forehead tattoo deeply waved line across forehead, on both boys and girls.

1368. WS male informant had two 4-pointed stars (one inside other) on chest; dots between them; also cross of dots inside inner one. He was taking nap one day, when youths seized him as they came out of sweat house, and said: "We are going to put a star on you." He struggled, hence star uneven; ca. 4 in. in longest dimension.

1369. KP women only tattooed on arms, and double zigzags down each side of chin from mouth corners; none in middle. Me women only tattooed cheeks.

1370. Age at which males tattooed. WS any; Hu, Li, KP 12 years; Me 12-20. Age at which girls

tattooed. Hu (before or after puberty), Me (12 to 20 years old), Li (before puberty, ca. 12 years old).

1372-1374. Needles and pigments for tattooing. KP single barrel-cactus or prickly-pear spine; other groups bundle of spines.

1373. Black pigment. Me only black mineral pigment, others charcoal; WS juniper charcoal.

#### Ear Ornaments

1375-1380. (See 1232.) WN Olivella and turquoise-bead ear pendants. EN woman's ear pendant of turquoise beads. WS women only wore Haliotis ear pendants. Hu glass ear pendants from Mexicans. Me whole Olivella from ruins and turquoise as ear pendants by both sexes; red mt.-laurel-seed ear pendant for men. Li ear pendant of bone tube with triangular Haliotis suspended by apex; silver earrings from Mexicans. Wa wood in bored ear lobe only to keep hole open.

#### Clothing

1381-1383. Headgear. (See 1202, 1203, 2711.)

1381. Fur cap, men. Wildcat (WN, EN, Me, Li); beaver (EN, Li); badger, for cold weather (NT, ST); fox (Me, no coyote skins used); sheep (SA); usually bareheaded (Ll).

1382. Buckskin cap with feathers. (See 1202, 2711.) WN eagle feathers on, not necessarily war cap. WS for dance and war. Hu by man who knew "medicine" for it.

1384-1393. Robes, shawls, capes (over shoulders).

1384. Of hide with hair on. WN sheep, goat. NT in cold weather both sexes fox neckpiece and robe of 5 foxskins sewed with buckskin. ST gray-fox neckpiece men only; robes and bedding of mt.-lion skin, sewed coyote and gray-fox skins. SC men's robes of coyote, mt.-lion skins. Ci deer-skin cape, hair side in, both sexes; in summer single skin; in winter 2 tied at shoulder, also other furs. WM both sexes cape of 2 fawnskins, hair in, shifted according to wind; afraid of mt.-lion and bear skins for clothing, but for bed blankets. Hu deerskin, mt.-lion capes, but no bear, badger, wolf, coyote, wildcat. Me both sexes deer or buffalo calfskin robes, sometimes mt. lion or bear, none painted. Me, Li clothed small children. Li robes of wildcat, mt. lion, jaguar, bear, deer, buffalo. Ll mt.-lion cape; few had. Ol capes and robes of buffalo skin. SU whole rabbitskins woven with twined weft of buckskin. Wa hide capes men only; women woven materials; wildcat-skin robe and comforter. SA buffalo robe; none of small skins sewed. SI soft tanned buffalo robe or deerskin by men, women sometimes. Woven blanket (1391) by women chiefly. Wildcat or fox (not coyote) sewed for robe.

1385. Cape of buckskin (dehaired). NT dyed red with alder bark. ST whole buckskin sometimes as wrap in cold dry weather. SC shawl for women. Ci

shawl improvised by tying legs of skin together. WS antelope skin.

1387-1388. ST wove rabbitskin for baby's blanket only. Except Wa, woven rabbitskin for bedding only.

1389. Robes, shawls, capes of woven twined vegetable fiber. SC, SU juniper bark. Me once only as per following story: Captive Mescalero woman from San Andres mts. taken to Comanche country. Escaped with aid of Comanche woman who felt sorry to see her cleaning buffalo hides continually. Hid her under rawhide bag. Prepared everything for her. Next day Comanche searched for her on horseback, while still under rawhide bag. When they returned, she started. Traveled 3 or 4 nights, hid in day. Cold close to mts., so wove self blanket of grass leaves nr. Pecos r.

Li cabbage-palm sheath with fibers crossing one another. for robe; no weaving necessary. SU blanket of strips of juniper bark with twined buckskin or Spanish bayonet yucca-fiber weft.

1390. Poncho (split in middle). WM woolen poncho, both sexes. Hu, Me buckskin poncho, both sexes. SA woven poncho for men, easily transformed into kimono-sleeved tunic by sewing up sides.

1391. Woman's shawl of woolen material. EN in olden days of mt.-sheep wool. WS, Ol imported. Wa women never wore skins. SA sometimes black manta as shawl; shawl over head like Zu, SI.

1392. Man's robe of woolen material. WS, Ol imported; WS gave Navaho, Hopi, or Zuni horse, or buckskin, or rifle for 1 blanket. Wa hung to knees.

1393. Robe of cotton cloth. WS imported. Wa, KP worn by women. Wa fine white "sand" for whitening woman's cotton wedding robe. Zu raw cotton from Hopi for weaving light cape (now replaced by handkerchief worn on back with band from 2 corners passing over shoulders and tied in front). SA women wore cotton cape.

1394-1420. Shirts and gowns. Garments worn from shoulders, other than robes, shawls, and capes covered in preceding (notes 1384-93). Southwesterners relatively well clothed compared with Californian tribes. Even children seem to have been more fully clothed in most groups. As children grew, the frugal SU ripped out stitching and made clothes over,

Age up to which children went naked. Children clothed from babyhood: Me, Li, Ll, Ol, SU. Others let them run naked, weather permitting, till following ages attained: WN, WS, Hu 2-3 years; EN, SI 3-5; NT, Zu 3; ST, WM, SA 5; SC 6-8; Ci 3-4; Wa 11; KP 4-5. At age of 3 NT child began wearing fawn-skin shirt.

1394. SU hung almost to knees, of single buckskin. Zu sleeves of buckskin shirts either of kimono or sewed-on (1395) type.

1395. Men's buckskin shirts, sleeved. For EN, SU, Wa, Zu, SA, SI, KP inquired if sleeve was kimono type or sewed-on tailored sleeve; others not asked, so entries in element list may refer to either except WN, Ci, Ll notes imply sewed-on

sleeve: WN sleeve reached to wrist. Ci, Ll seam on under side of sleeve.

NT shirt of 2 antelope buckskins. ST of antelope or deer buckskin, flesh side out, sewn down sides, open in front to sternum, made by "rich" men. Fur shirts of 15 or 16 Abert squirrelskins, worn fur in. Ci no shirt before whites, merely skin or two tied across body, as in 1384, 1385. Me shirt over top of leggings. Ll seam down sides, fringed along top of sleeve; buckskin clothing hardened by moisture worked soft with hands.

1396. Opening of shirt fastened together. NT open to below sternum. SC string ties through slits in buckskin. WS only sometimes pinned neck opening with stick. Li some front opening, some transverse neck opening, i.e., across shoulders (Wissler, fig. 12). Ol transverse neck opening tied at ends, no vertical front opening; no undershirt.

1398. Buckskin shirt painted yellow. Ci, WM yellow clay rubbed in with water; whole shirt, Ci, WM; neck region, WM. Me yellow clay. Ll yellow ocher.

1399. Buckskin shirt painted white. Me, Ll white clay.

1400. Buckskin shirt dyed or painted red-brown. Alder bark NT, Ci, SA, and probably SI. NT dyed antelope buckskin shirt with alder to prevent drying hard after rain. Me, Li red clay for coloring shirt.

1401. Buckskin shirt painted orange. SC from root of shrub. Li orange clay; some uncolored.

1402. Painted design on buckskin shirt. SA deer, antelope, buffalo.

1404. Fringed buckskin shirt. Ci at bottom, at side seams, at sleeve seams. Me gala shirts fringed, daily not. Li cocoon fringe on shoulders of children's clothes; not rattles. SI man's gala shirt only fringed.

1405. Porcupine-quill embroidery on man's buckskin shirt. Li some with undyed porcupine quills. Ll some at shoulders. SI fancy shirts sometimes.

1406. Cotton shirt. KP sometimes; tucked inside loose cotton trousers with drawstring as in pajamas. Trousers of Mexican type, but thought aboriginal.

1407. Woolen shirt. Wa usually blue dyed; sometimes undyed.

1408. Wa no underwear. Zu no undershirt.

1409. Short-sleeved tunic. EN woven of red yarn from Mexican blankets; earlier of buckskin (1412). Zu no skin clothing for women except leggings, moccasins. KP cotton tunic, short sleeves sewed on.

1411, 1412. Tunic of buckskin. WN fringed short sleeves, not reaching elbows. SC unfringed daily wear; fringes foot long on gala attire. Ci wife or daughter of poor hunter not much buckskin clothing. WM no fringes till after whites.

1413. Long dress of buckskin. NT made by man of 2 deer buckskins; from neck to below knees, fringe around ankles and long seams; ends of buckskin sewing cords formed fringes; no dewclaw

decorations. ST tunic of large female buckskin painted yellow; poncho-like neck opening; sewn down sides; no sleeves, fringes on shoulders and side seams. Fringes tipped with rolled tin from Navaho; no earlier use of flints. Me also claimed with some hesitation full-length dress with sewed sleeves; all other groups denied. Li full-length dress of 2 1/2 buckskins; informant selected Wissler, fig. 12, as Li type; neck opening transverse. SU reached below knees; seams at sides; 2 buckskins.

1415. Woman's buckskin dress painted white. Ll also yellow ocher.

1416. EN woven dress of finely spun Spanish bayonet yucca fiber when buckskin scarce, composed of 2 rectangular pieces, front and back, sewn down sides. Men wove horizontally on 4 stakes.

1417. Pueblo woven dress or manta imported by SA from Hopi, as no longer made at SA.

1421-1448. Loin covering.

1421. Buckskin belt. WN girdle to hold breechclout, which men only wore. NT woman's belt on outside of dress (1413). SC man's belt 2 in. wide. Ol man's belt against skin; women's (1422) on outside of dress. SU women wore no belt. Zu poor man wore buckskin-string belt (1427) and woolen shirt; well-to-do man wore buckskin shirt, skin knee breeches (sic), woolen stockings, buckskin moccasins. SI men sometimes soft rawhide-rope belt to support breechclout and leggings. Wa, Zu, SI, KP men only buckskin belts. Wa, SA men also rawhide belts.

1423. Braided yucca or agave fiber belt. ST new mother's belt of buckskin (1421) or agave fiber; no work during month worn. SC girdle of 3-strand yucca braid men only. Zu no yucca on body lest cramps.

1424-1426. Woven belt for woman. WN red wool. Wa cotton only for trousseau. KP cotton belt outside dress, 3 to 4 in. wide (see 1444). Drawstrings for men's trousers and women's skirts (1444), cotton-cloth strips inch wide.

1427. Cord of agave fiber for girdle, NT, SC, Hu. Cord girdle by men only, Zu, SA. NT man's girdle diameter of middle finger, wound 4 times around waist. SA rawhide rope or wool rope.

1428-1432. Breechclouts. EN formerly woven juniper bark or grass, or sometimes shredded bark without weaving; also woven rabbitskin. EN only woman sometimes wore breechclout, if no skirt. NT undyed antelope buckskin. ST yearling-fawn buckskin, head end in front, tail behind; hung about foot fore and aft. Hu sometimes mt.-lion fur. Wa imported buffalo skin. SA woolen or cotton fabric. SI black woolen fabric. KP men wore only breechclout in hot weather. In modern times cloth replaces buckskin: EN, WS, Hu, Me, Li, Ll, Ol.

1433. Zu woolen and cotton front and back aprons.

1437. Kilt a cloth wrapped around waist. Wa of cotton or wool, daily over breechclout.

1438. Kilt a skin wrapped around waist. WS, Hu, Me buckskin. Zu sometimes mt. lion or wildcat. Hu kilt less than knee length. Me kilt of earlier times replaced by breechclout; tied kilt in place with cord.

1439-1442. Front and back aprons. EN juniper bark, knee length; shredded and tied to girdle cord; only when dearth of better materials. NT woman's 2-piece underskirt of antelope buckskin, open on sides; both skirts same size. Worn under buckskin dress; reached to below knees slightly, so when woman sat in regular buckskin dress, front apron fell between legs for concealment.

1443-1448. 1-piece skirt. EN shredded juniper-bark tubular skirt, knee length, when dearth of better materials; bark tied to or over cord. ST skirt of 2 buckskins (male and female). These laid on ground, cut in half. Front formed of male and female, back of male and female. Side seams fringed. Reached halfway between knee and ankle. Opening at upper part of 2 side seams with buckskin thongs for tying. Painted yellow around waist. WM skirt of 2 buckskins laced together at sides; knee length; no underskirt, hence woman sat carefully without spreading legs. Li turkey-claw fringe on woman's skirt sometimes. KP cotton cloth with drawstring at waist, not fringed, ankle length; tunic tucked inside skirt waistband.

#### Fur mittens.—

1449. WN wildcat. NT, ST Abert squirrel. ST case skinned, head end at finger tips. WN, NT mittens with cord to hang around neck; ST without. WN separate thumb; others without. All hair side in.

#### Buckskin leggings.—

1450-1455. EN tied at bottom with cord passing under foot. NT short buckskin legging covering bottom of long legging and top of moccasin; buckskin lacing, not wound around leg; for long leggings 1 antelope buckskin each. ST antelope buckskin. WS no leggings, probably because high-topped moccasins (boots). Hu long leggings with low-topped moccasins formerly; latterly, short leggings (hips to knees) with high-topped moccasins. Me men's and women's leggings both hip length; sometimes tucked into woman's high-topped moccasins or boots, sometimes worn outside boots. Li men only wore winged and fringed leggings. Ll, Ol men only wore fringed-buckskin leggings; double leggings in winter hunting, outer a wrapping of buckskin tied on with buckskin cord (1453). SU man's hip-length leggings; woman's knee-length and tied around at top with buckskin string. Zu man's buckskin leggings like knee breeches. Zu claimed ancient, Hu modern. Zu also had actual knee breeches, formed by cutting buckskin to cover loins and sewing it to leggings. SA leggings of sheepskin with wool for winter.

1456. Pueblo woman's spiral buckskin calf wrapping. Related to this was modern device, ob-

served among WN, EN, Wa, of attaching whitened buckskin calf wrapping to moccasin, making 3-piece moccasins; attached around heel and half-way forward on moccasin. WN women observed wearing for squaw dance. Wa upper in 2 parts; 1 from toe to instep, second from instep back and with high top for wrapping around calf; part of trousseau. No women's leggings formerly; calf wrapping modern. SA hind part of upper long and high for wrapping around calf; tied with wrapped-around cord. SI ceremonial; when wearing this women do not wear high boots, but ankle-high moccasins with toe ornament (1474).

#### Footgear.—

1459-1477. Hard-soled moccasins. WN informant knew only present-day type.

1460. 2-piece moccasins, i.e., sole and upper. Ol single-piece upper of man's moccasins included heel fringe and folded-down tongue.

1461. 3-piece moccasins. (See note 1456.) SA, SI upper 2 pieces; toe-instep-tongue in one; from instep back 2d piece wide enough to tie around ankle; sometimes SI sufficient to cover lower calf.

1462. Men's moccasins, short tops. NT, ST above ankles. WM women's old-style moccasins low like men's; women bare-legged between skirt bottom and moccasins. SU women's like men's. Wa men's uppers in 2 pieces, came little above ankle. Zu poor people goat-hide moccasins crudely sewn with yucca fiber; better moccasins of deerskin; both sexes alike. SI uppers of deer and antelope buckskin, mt.-sheep skin.

1463. Women's knee-length boots (moccasins), or with high folded-down tops. ST to knees, sometimes folded-down tops. WM folded-down tops modern. WS antelope-skin uppers. WS tops of both sexes folded down in hot weather. Li top folded down from knee to ankle; long enough to pull up to hips, which not done, worn knee height. SI women's everyday boots of buckskin with high double folded-down tops, tied around with buckskin cord just below knees; upper all one piece.

1464. Men's moccasins knee length. Ci women's like men's, high tops pulled up to knee. Man's legging worn over moccasin. WS men's like women's, tops up to knees in winter; winter moccasin lacked turned-up toe.

1465, 1466. Buskins reaching knees worn in winter. NT men wore buskin with rabbit fur sock for snow travel. Wa sheep- or dog-skin foot and leg wrapping—no moccasin under it—entered in element list as "buskins reaching knees." Zu knee-length buskins of sheepskin. SA men wore rabbit-fur sock or insole; women sheepskin insole.

1467. Plant-material insole worn in winter. Juniper bark (EN, Ci, WS, Hu, SU), juniper bark not used (Me, Li, Ll, Ol, Wa, Zu, SA, SI, KP); oak-leaf insole (Ll, Ol), oak leaf not used (SU, Wa, Zu, SA, SI, KP); gramma-grass insole (WS); yucca-leaf insole (NT); cottonwood-leaf insole (Ll).

1470. Fur moccasins for winter. WN sheepskin, wool-side in. Wa dog or sheep skin for both sexes; also improvised "snowshoe" of sheepskin tied on with yucca fiber. SI men's of wildcat fur, uppers same cut as regular moccasin, reaching above ankles; leggings on outside of men's moccasins at all times. In summer fastened at instep, in winter at sides in addition, to exclude snow.

1471. Hide overshoes. WS deer, beef, horse hide; over moccasins in winter, reaching just above ankles. Hu hide overshoes to ankles. Me mt. sheep, elk, buffalo hide; laced under foot. Li buffalo-hide overshoes in winter, over moccasins. SA winter overshoe of sheepskin, men only, reached to knees. Sewed up to ankle, piece for wrapper above ankle, tied around with woolen string. Since worn over regular moccasins I have called overshoe instead of buskin.

1472. Porcupine-quill embroidery. Wa men's ceremonial moccasins.

1474. Moccasins with turned-up, round, dollar-size toe. EN ball-like projection on toe for protection of foot. ST rare because not enough buckskin. SC sometimes boys' had turned-up toes. WM turned-up toes on women's from "Chiricahua" Apache. SI turned-up toe on women's for dance only.

1475-1477. Rawhide for moccasin sole. Horse, WN, WS, Hu, Li (also donkey, mule), Wa. Cattle hide, WN (also for rope, bridle, saddle), EN, WS, Hu, Wa, Zu, SA. Bear's face, Ci. Buffalo neck, SU. Antelope, Wa. Deer neck always buck, Wa. Buffalo rawhide from any part of body including face, SI. Badger, EN, Wa. Elk, WN, Li, Zu, SI. NT men made moccasins, attaching soles with piñon pitch besides sewing.

1478. Yucca-fiber "shoe." WN had heard of, but could not describe. SC traditional in informant's father's day. Wa moccasin of yucca-fiber string in checker weave, even sole of string.

1479, 1480. Sandals. EN sandals of badger hide or plaited yucca leaves, or slipper of cattail leaves, worn before moccasins adopted. NT deer's neck rawhide sandal in camp; 2 vertical side straps; 2 cords in front, one between great and 2d toe, other over little toe; encircling cord around ankle. Cords of buckskin. Men and women wore, not children. SC deer's neck hide doubled for sandal. KP rawhide sandals seen, like Cocopa in manner of attachment (Gifford, 1933, fig. 3); sometimes toe turned up for protection.

1481. Commonly barefoot (at home). EN women barefoot much. Me, Li barefoot about camp, especially in heavy rain. Wa women wore moccasins only in ceremonies. SA barefoot around house in summer.

1482-1484. Snowshoes. SC old moccasins, grass or bark wrapped, worn in mud and snow. SI juniper branch bent to shape of moccasin, cross sticks; tied with stays of buckskin from edge of snowshoe to ankle.

## BEDDING

Mattress.—

1486. Pad of vegetable material for mattress. Juniper foliage, Ll, SI; juniper bark, EN, SU, SI; grass, EN, NT, SC, Ci, WM, WS, Hu, Me, Li, SI; pine needles, Ll, Ol, SI; yucca fiber, WN. EN earliest mattress merely grass pile; "when Mexicans brought firearms, Navaho got hides for mattress." NT grass-pad mattress ca. 8 in. thick, no hides over it. ST cliff-rose bark. SC brush, covered with soft grass, mammal skins on top. Me ground hollowed for winter bed; filled with willow and juniper bark, and grass. SI in camp, brush and juniper bark.

1487. Hides for mattress. WN sheepskins. WM hides over grass mattress. SU doe hide on juniper-bark mattress. Wa sewed coyote and wood-rat hides; buffalo hides by trade for well-to-do people. Zu sheep, bear, deer, antelope hides; woven rabbit-skin blankets; woven woolen blankets. SA lower part buffalo or cattle hide, upper sheepskin; no deer or antelope hides. SI in pueblo, buffalo, bear, deer, mt. sheep, coyote, antelope.

1488. Willow mat with rawhide twining (Plains type). In summer, Me used on bedstead supported by 4 forked posts, 2 ft. aboveground. On willow mat, skins, etc., laid.

1489. Woven-yucca-mat mattress. WN yucca-fiber-mat weave uncertain. Me yucca-fiber mat for child's mattress, skin on top. Li mat of split yucca leaves, checker weave, grass and hides over. KP mat of split yucca leaves.

Blankets.—

1491. Badger skins. ST 6 skins sewed 3 in each row; for bedding or robe. Me not used "because eat snakes."

1492. Coyote skins. NT, ST 6 skins sewed with sinew thread; bedding only. SC blanket of coyote skins, grass on top. Ci 4 coyote skins sewed. Ol coyotes not killed.

1493. Foxskins. SI sewed together for bed-covers; also used in dances.

1494. Wildcat skins. SC 4 for blanket. Ll 6 bobcat skins for bed blanket.

1497. Antelope skins. Li antelope and white-tailed deer fawn for saddle blankets, not bedding.

1498. Buffalo. SU very few had for bed blankets.

1499. Mountain lion. Li also jaguar blankets. Wa from Havasupai; woolen blanket or man's blue sleeveless shirt for 1 mt.-lion hide.

1500. Bear. Ol not killed.

1501. Other skin blankets. WN sheepskin. SC sewed rabbitskins for baby. Ci pine squirrel skins sewed with sinew thread. Hu calfskin. Li peccary-skin blankets and mats. Wa wildcat skin.

1503. Woven-plant-fiber blanket. EN, SC, SU any soft bark. EN grass. WN yucca fiber. Other groups none of these. EN men wove blanket of untwisted Cowania or Apache plume bark, using yucca weft. SC juniper-bark woven blanket traditional in

informant's father's time. SU juniper-bark blanket. EN, Me, SU sometimes shredded fibers for covering.

1504. Woolen- or cotton-blanket bedcover. WM, WS from Navaho. Wa woolen and cotton comforters, especially latter. KP cotton bed blanket.

#### SITTING POSTURES, GREETINGS, ETC.

1505. Men sat crosslegged (Turkish style). Women too (NT, ST); denied elsewhere for women. Cross-legged habitual Ll men's style. SI informant described cross-legged sitting as Apache style.

1508. SU women also sat with one leg out, one under.

1509. Me sat on heels sometimes when shooting at enemy; also one knee back and one up (1511) when using bow or gun.

1511. One leg folded back, other knee up. Women only (NT, SC), men only (Ci, WS, Hu, Me, Li, Ll, Ol, SU, Wa, SA, KP), both sexes (WN, EN, ST, WM, Zu, SI). Ci men in case of alarm, so could rise quickly.

1512. Hu informant only said women sat on buttocks with knees up. Wa men hands around knees when so sitting.

1513. Hu, Me, Li men also sat with feet curled.

1515. Wa when hoeing rested standing with foot against knee.

1518. Tear salutation limited to women WN, WS; to men WM.

1520. Hand shake. Part of embrace (EN, Wa, Zu, SA, SI), one hand around shoulder, other gripping hand.

1521. Li kissed on cheek only. SA lovers only kissed.

1522. Meals 2. SC ate between meals. Zu breakfast ca. 10, not at sunrise as with other groups. SI 2 meals in camp.

1522a. Meals 3. Li ate between meals. SI 3 meals in pueblo.

1524. KP avoided sleeping with head E, as souls of dead went E.

1525. Walking-stick for elderly person. NT ash wood with crook handle bent in fire, tied with yucca leaves 2 or 3 days until hard; both sexes used. ST of cane or ash wood, 3 1/2 ft. long.

#### BURDENS

1526. Distance travel by running (trot). EN, Wa messengers walked only to rest.

1527. Men carry some property when traveling. EN only denied, said men hunted. Men of all other groups helped carry food, household effects, small children. Men carried the heavier loads: SC, Wa, SA. Zu man carried most loads in farming; no change of residence save temporarily near farm. SC men carried maize ears tied together.

1528. Zu yoke pole with load on both ends by men to carry water. Ll pole between two bearers

with load in middle. Zu, NT, Hu, Ll, SI single load pole (over shoulder); Hu hunter or traveler carried light load; Zu hunter, or farmer with seed.

1529. Stretcher of buckskin for disabled person. NT 6 bearers. Ci 4 or 5 men as bearers.

1530. KP saguaro ribs as crosspieces on ladder-like litter.

1531. Hu litter of 2 poles connected with yucca-leaf ties and sometimes with skin laid on these.

1532. Carrying of person on back with blanket or rope sling. SC rope only. Others blanket, with rope makeshift; WS, SU, Zu, KP denied rope altogether. Wa, SA, SI rope across chest, not over head. Ci children only with blanket or rope over head or chest of bearer. WM children only in buckskin blanket so child astride bearer's hips. Hu blanket sling sometimes for child, not for goods. Me instance of wounded man carried with rope. Ll children only in blanket. SU sick people not moved around. Zu wounded on back; dead also if no donkey. SA rawhide strap for carrying person. SI wounded sometimes on back with rope.

1533. Load poised on shoulder. NT, Li, KP men only. ST wood. WS, SI short distance. Wa cotton sack. SI sometimes in rawhide or buckskin double-ended bag.

1534. Head carrying by women. KP more prevalent than formerly because kioho carrying frame (1572) now rare. Formerly pairs of water jugs in kioho if distance great; each had grass stopper. If short haul, jug on head with yucca heading (1538).

1535. KP women only carried water on head.

1536. SA women only used heading. SI men only, for wood carrying.

1537. Wrapped heading. SA willow-bark wrapping. SI juniper-bark wrapping over split yucca leaves.

1539. Water carrying in pottery jar. (See note 1534.) ST carried but seldom kept in it; if heavy, pack strap over forehead; if light across chest. Me, Li clay pot for storing water at camp, not carrying. HP kioho carrying frame (1572) chiefly for pots of water.

1541. Water carried in gourd canteen. NT gourd with constricted neck. SC also pumpkin shells.

1542. Water carried in paunch, bladder, gut. Only in emergency, as on hunt, for not over 2 days, as rotted. SU exception used paunch 4 or 5 days for water, then ate. Paunch: EN, SC, Ci, WM, WS, Hu, Me, Li, SU, SA. Bladder: NT, WS. Gut: WS, Hu, Me, Li, SA.

1543. Water carried in skin bag. Peccary skin, Li; fawnskin, EN, Zu; deer neck skin, Me; deer hindquarter skin, Me, Li; buffalo rawhide, Li, SI; goat or sheepskin, not deerskin, WN; horse skin, Li. Me bag edges fastened with wooden pins; then smoked; watertight by swelling of hide after water in it.

1544. Pack strap over head by both sexes in all groups, except women only: NT, Ci, KP. SC head position for man rare; usually over shoulder or in hand. Me said head position for pack strap was W style, not Me.

1545. Forehead protected from chafing of pack strap. WN extra thickness of buckskin. Ci pad of grass or leaves. WS buckskin wrapping on pack strap. Hu buckskin wrapping or pad. KP plaited-yucca-leaf pack strap (1549) broad in center.

1546. Pack strap across shoulders and chest men only: NT, SC.

1547. Pack strap a bandoleer over one shoulder, under other arm. With exceptions (1181, 1182), usual means of carrying quiver. Other loads sometimes similarly carried. Men only: EN, NT, SC, Ci, WS, Hu, Me, Li, Ll, Ol, Zu, SI. WN light load, as in fawnskin bag; EN tobacco bag. Wa quiver only. SI sack of food. KP roll of bedding.

1548. Woven pack strap. ST pack strap twined from green mescal-fiber string; movable weft; band narrowed at ends where warps knotted together; also 4- and 6-strand braided tumplines, ca. 4 in. wide.

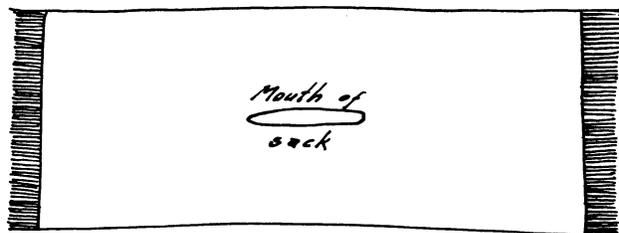
1549. Spanish bayonet yucca-leaf pack strap. WM for pitched water basket. KP braided pack strap for kioho carrying frame; broad in center for head protection; mescal-fiber ropes to ends of central portion; women made.

1550. Hide pack strap plain except ST braided. KP women only used. Wa buffalo-hide pack strap, "as buckskin stretched"; no deer hide.

1553a. Rawhide "bags." Hu on back, pack strap over head or shoulders.

1554. Parfleche. WS deer rawhide, later of cattle hide; unpainted; tied around with cords instead of laced. Hu rawhide carried on back with pack strap over head or shoulders; also buckskin wrapping as container for some materials other than food. Li peccary-skin parfleche. Li side flaps folded on outside and laced. SA, SI for meat storage.

1555. "Saddle bag" (open in middle). (See fig.) EN buckskin, not rawhide; before horse;



carried over shoulder. WS fringe at each end; on horse to carry seed. Me elkhide for saddle bags sometimes. Li pot in rawhide bag when moving. SA rawhide, buckskin, woven material; on horse or over shoulder. SI for storage and carrying; usually fringed.

1556. Brief-case-shaped rawhide bag. SI for clothes storage.

1558. Cylindrical feather case. SU for carrying tools; informant's wife had one she made. SI storage of various articles, not food.

1559. Rawhide bucket. Li shaped like metal bucket, for burdens.

1560-1563. Buckskin bags. EN also of sheep, goat, horse, and cattle skins. SC food trans-

ported, but stored in old basket. WS antelope-skin bags. Li special saddle bag for little girl. SU sack tied at both ends, carried like blanket roll with strap over shoulders and chest; men carried in buckskin sack, not burden basket. Wa soft elkhide buckskin from Havasupai; made into sacks when cotton lacking; for clothes storage and to carry maize from fields. No food stored in skin sacks, except fawnskin (1564) temporary storage to keep out dust. KP bag with longitudinal slit, for clothes storage.

1564-1567. Fawnskin bags. NT men's small fawnskin bags for storing sinew, etc. Hu sometimes for acorns or piñon.

1568. Hide-and-stick carrying basket. Me flat bottomed; for carrying walnuts, piñon, cactus fruit, yucca fruit, etc.

1569. Woman's sack of woven material. WN wool, made by women for carrying maize. Zu also small wool bags checker woven with fingers.

1571. Carrying frame of 2 or 3 U-sticks with wrapped-weave strings. Resembled Mohave carrying frame. WS 3 U-shaped sticks with courses of yucca leaves wound around closer than Mohave; temporary for carrying yucca fruit, etc; thrown away. Hu, Me, Li temporary, 2 U-shaped sticks wound with split yucca leaves; both sexes to carry yucca or other fruit; thrown away.

1577-1582. Net carrying bag (hammock type). KP, HP agave-fiber net sometimes for transporting cactus fruit, sacks of grain, jugs of water on horseback. For cactus fruit, net lined with grass to prevent cords cutting fruits. Apparently edges laced together. HP also of rawhide.

1583, 1584. Network for gourd or clay water jug. WS, Hu of rawhide for gourd canteen: 2 disks of rawhide, one on bottom; other, perforated for neck of canteen, encircled top; 2 laced together with rawhide; 2 loops for carrying strap. Wa cotton-string ties on gourd; pottery water jars needed no network as lugs for pack strap. Zu of woolen strings; maize-cob cork for gourd canteen.

1585. Yucca, saguaro, etc., plants as "baskets." NT improvised yucca plant for saguaro fruit by removing center leaves and tying ends of outside leaves over load, which thus encased. Zu yucca plant as cage to carry nest and young blue jays or sparrow hawks home to rear for feathers for ceremonial; fed on grasshoppers, etc. SA yucca plant as emergency basket for prickly pears, etc.; withe and yucca fiber to weave into basket. Wa no yucca plant, but sometimes sumac bush with many shoots. SC only saguaro skeleton as improvised basket. Ci 2 saguaro boles together to hold caked fruits; wrapped with Spanish bayonet yucca leaf; also to soak dried fruit.

1586. Burden baskets, in general. ST little girl's toy burden basket. SC men no burden basket. EN, WS, Hu, Me, Zu men same type as women. WS woman of house made burden basket for each; men for deermeat after lining with leaves; lined with snakeweed for fruit likely to be bruised. Me flat bottomed. SA men only used Apache flat-

bottomed burden basket for packing provisions on trip; preferred because light.

1589. Wicker burden basket. EN both sexes made flat-bottomed wicker basket of willow or sumac for emergency carrying of yucca fruit. Wa men made, used wicker burden baskets; sometimes used by old women too. Two bent U-sticks outside formed corner warps; eight smaller warps; weft of sumac (?) stems; lugs of narrow-leafed yucca fiber; for peaches, maize, watermelons, etc. Zu made by women, of willow, flat-bottomed, W Apache twined burden baskets as models; Zu woven cotton and woolen goods to Apache for baskets; 2 groups visited equally; both sexes used burden baskets.

1590. SI men made twined, flat-bottomed, willow burden baskets, 2 handles for strap attachment for back; no design; both sexes used; smaller than fish basket (note 242).

1590a. Colored designs in tightly woven burden baskets. Red and black, ST, SC, Ci (modern), WS (sometimes), Hu (yucca root for red; *Martynia* for black), denied by others except WM doubtful. Green and brown, WS (sometimes), Me. Black (*Martynia*) only, NT, ST (sometimes), SC (sometimes), Ci (modern), WM, WS (sometimes), Hu (sometimes).

1591. Bottom of burden basket reinforced with leather when made (NT, SC, Ci, WM, WS, Hu, Me); for repair only (ST).

1592. Twined burden basket, waterproofed. NT pulverized saguaro petals mixed with water. NT, ST, SC, WM cooked mescal juice. Ci sap rubbed in to close interstices, for seed carrying. Hu cactus juice to coat.

1593. ST diagonal twined weave only in old days, but now plain twining. Temporary burden basket: 2 rings of sumac wood, larger for top edge, smaller for bottom; connected by vertical yucca-strip warps; 3 or 4 encircling twinings of yucca strips.

1593a. WN only conical twined burden basket like Yavapai. NT knew as Yavapai only.

1594. Flat-bottomed, plain-twined, double-warp burden baskets. WS flat bottom had concavity. Hu mulberry. Me mulberry and sumac, weft sometimes narrow-leafed-yucca strips. SA (note 1586).

1596. Four reinforcing vertical rods inside burden basket. Me wove 2 bent oak withes into basket. Pack strap sewed to piece of rawhide (sometimes inside and outside of basket).

1598. Me burden baskets with buckskin decoration festive.

1599. Coiled, flat-bottomed burden basket. Ll made and used by women; men packed on horseback. SU Spanish bayonet yucca sewing over sumac-stick base, no design. HP burden basket for saguaro fruit, etc.; poised on headring; no pack strap, not suspended.

## BASKETRY

### Basketry Techniques

Coiling commonest method; Wa only group who did none, but obtained coiled baskets from Hopi of Second Mesa for wedding and other ceremonies. Twining, 2d commonest technique, essentially

Apache except for SI and WN; however, 3 Apache groups lacked it: Li, Ll, Ol. Wicker recorded for certainty among EN, NT, ST, WM, Wa, Zu; SA men made certain willow baskets, but not ascertained if twining or wicker, though suspect latter. Twilling recorded only for Wa, SA, SI, KP; denied elsewhere except HP (not inquired); twilling obviously not Athabascan.

Basketry importations. WN from Paiute, coiled "wedding" baskets. EN from Paiute and Ute, coiled baskets for food and ceremonial uses. Wa from Hopi of Second and Third Mesas, coiled and wicker plaques respectively, for ceremonial purposes. Zu from Navaho and W Apache, pitched water baskets and ceremonial baskets. SA from Navaho and Jicarilla Apache, twined burden baskets and coiled pitched water baskets. SI from Jicarilla Apache, coiled food baskets. Ci sold baskets to Zuni and Navaho when they came to Cibecue country; also Cibecue visited them.

1601. Ol, Ll, Su made only coiled baskets. Ol 3 forms: plaques (1637), cylindrical, pitched water bottle. First 2 made to trade to Pueblos for farm products. Only 3d type (1647) regularly used by Ol themselves; cylindrical baskets sometimes for trinket containers (1658).

1602. Coiling clockwise, looking into basket. EN left-handed worker only.

1603. Awl thrust into inside of basket when sewing. Whether open basket, or bottle-necked, or small cylindrical one, was largely determinant whether awl entered inside or outside. At least so with NT, WS, KP; with small opening awl within impossible. Ci awl entered inside of basket dish, ends of sewing material trimmed on outside; cooking basket reverse.

1605. Single-rod coiling, Zu only, willow foundation; sewing willow split 3 ways.

1606. Following data best obtained by basket examination. Few positive responses from informants: Sewing stitches pass through bundle of splints, NT, ST, SC, WM, HP. Stitches do not interlock, NT, SC, WM, Ol, SU, SI, KP, HP. Split stitch, NT, SC, WM (sometimes), Ol, SU, SA, SI, KP. Double coiling, SC (sometimes). SU informant displayed 2-rod burden basket of sumac (foundation and sewing material).

1607. 3-rod-foundation coiled basketry. Ll, Ol whole peeled willow rods, of equal size; informant denied 5 (Goddard, p. 159). Ol traded plaques to San Juan and Santa Clara pueblos especially. SI like Ll, Ol; 3 rods, willow or sumac; split sumac for sewing material.

1608. Coiled basket foundation one rod and bundle of fibers. WS fibers or strips of leaves of narrow-leafed yucca (1677). Me sumac, willow, or mulberry rod with 2 to 4 strips from leaves of narrow-leafed yucca (1677).

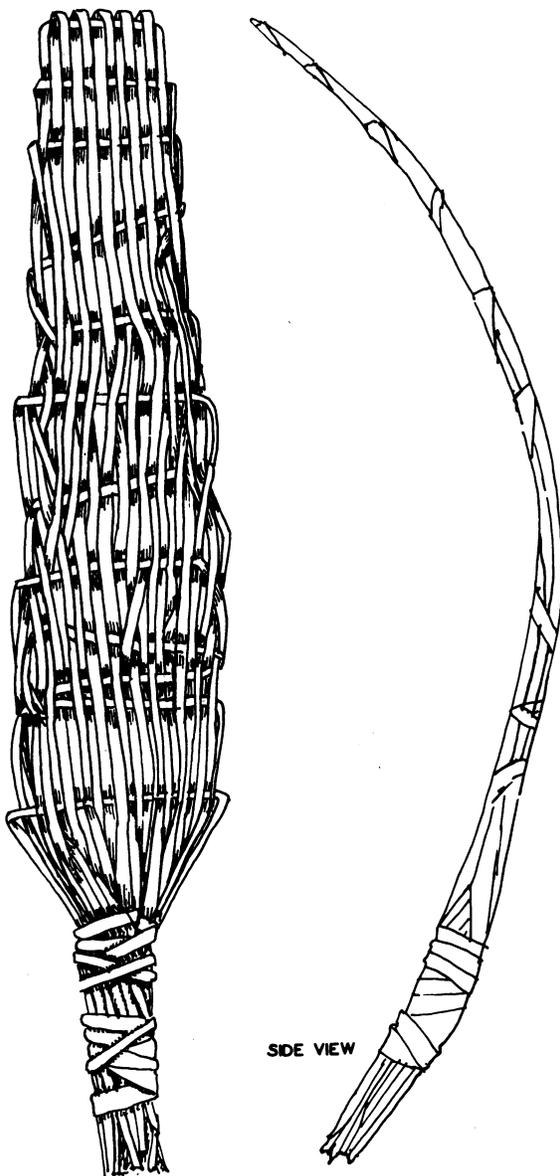
1609. Multiple-foundation coiled basket. KP tule skin for edge from Sacaton Pima; formerly sharp-bladed grass for edge; no dyeing. HP foundation split stems of water plant, called tule by interpreter, but seems too stiff; no split stitches in example examined.

1620-1622. Wicker basketry. Wa got ornamental Oraibi plaques for wedding and other ceremonies; purchased with cloth dresses and belts, pottery. Wa made square flat plaques of scraped cotton-wood shoots as dishes for freshly cooked paper bread. Zu winnowing basket examined had radiating warps which became parallel on sides. SA willow baskets by men (wicker or twined?) had rim wrapping tightened with bone or wooden awl.

1623, 1624. Twilling. SA men made yucca winnower-sifter (1632). KP made deep basket (Goddard, 136) for straining saguaro juice; sometimes lids for twilled baskets.

#### Basket Types

1625-1630. Seed beater. Varied from oval to wedge shape, twined in some groups, wicker in others (see fig.). NT of sumac stems.



1631-1635. Winnowing, sifting, parching trays.  
1631. Me twined sifter actually shallow burden basket; see note 305.

1633. EN parched piñon in coiled basket. Me for winnowing (Goddard, 161). Zu coiled basket bowls from W Apache and Navaho for shalako ceremony.

1634. Zu wicker sifting basket which let dirt through interstices; very little throwing up and winnowing in process.

1637. Coiled basket plaque. WS dish. KP not formerly; now for whites.

1638-1642. Boiling baskets, etc.

1638. Ci coiled baskets, not coated, water-tight through swelling of material. WM only coated coiled basket for liquid with application of cooked mescal syrup; no basketry water bottles so coated.

1640. ST same basket for food dish and drinking cup.

1641. HP tightly woven, uncoated coiled basket for saguaro-wine container and for watering horses.

1642. EN coiled basket bowl for winnowed seed.

1643. Basketry water bottles general. Ci old ones for seed storage. WS grapevine as material. Zu by trade from W Apache, Navaho. SA from Navaho and Ll, Ol; 4 or 5 "loaves" of bread or small quantity of maize meal, bread, paper bread in exchange for 1 basket.

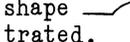
1647. Coiled basketry water bottle. NT design in black Martynia. SU 2 seen 2-rod, 3-rod respectively; pitched inside only.

1649. Exterior of basket water bottle coated with red clay, etc., before pitch. NT filled interstices and reddened with mashed juniper leaves and alder bark. ST, SC, Ci, WM, Hu with juniper leaves and red clay. EN, Ci, WM, Me rubbed in pulverized red clay and rabbit dung. WM, Me horse dung instead jack-rabbit dung nowadays. Me sometimes rubbed red clay into warm pitch after coating. SU sometimes rubbed in deer dung and red earth before pitching; only one of 4 examples seen so treated, 3 had whitened, unpitched exteriors.

1650. Basketry water bottle coated with piñon pitch. Ci pitch boiled on calm clear day as less danger of catching afire; "if worker bothered by children, boiling pitch might explode." WM pitch collected in slab of pine bark, another tied over as cover. Me bottle of sumac, not too tightly woven; so pitch applied inside first could fill interstices; had "lucky" boy put first handful of pitch in pot for melting. Ol juniper pitch also; Ol, Ll like SU, rarely with pitch on exterior (note 1649).

1651. Pitch applied to exterior of basket with "brush." Macerated ends of Spanish bayonet yucca leaves as brush (EN, Ci, WM, WS, Hu, SU). NT brush of bear-grass leaves tied with yucca leaf.

1655. White clay on exterior of basket. EN "go blind" if used. Possibly Ll, Ol used; I did not inquire, as unacquainted with practice till I reached SU.

1656. Wooden lugs on basketry water bottles. Sewed to exterior of basket. ST, SC of scrub oak, either naturally formed , or bent to shape . WM only angular type as illustrated.

1656a. EN, SU horsehair lugs modern; SU formerly basketry material. Ll horsehair. Ol buckskin pack strap sewed on with basketry material while basket being made.

1657. Corked basket water bottle with bark. EN plug of sagebrush bark. SU ball of washed sagebrush bark.

1658. Trinket baskets. Coiled, SC, WS (sometimes globular), Ol, SU, KP (modern). Twined, NT, Ci, WM, Hu. Wicker, Zu. ST, Me skin bag for small objects. Hu burden basket as trinket container. KP make to sell to whites; none formerly.

#### Miscellaneous

1659. Three colors (2 in pattern). SC black and red, black alone commoner. WM figures of men and animals modern; "began decorating in 1870"; informant said ornate baskets in Roberts' paper on San Carlos basketry not old type, also no bottlenecked baskets anciently, except pitched water bottle. Me if not alternate colors in basket design go blind. Wa no basket had colored woven-in pattern. Basket maker avoided by family denied by all except NT, WM, SA (doubtful), SI (doubtful).

1662, 1663. SA men made all baskets: twilled-yucca winnowing, sifting, and straining baskets; coiled bowls; willow baskets either twined or wicker, probably latter. Basket maker preferred to work alone. Informant made 2-rod coiled baskets without pattern. Only one male basketmaker in 1935. SI women sometimes made fine coiled baskets as well as men. Informant's father made coiled baskets like those of Jicarilla Apache.

1664. ST berdaches did not make baskets "as too lazy."

1665. Break in annular basket design. EN if no break maker would lose her mind. SU would die soon.

1666. Head washing from basket, etc. Me wooden bowl or rawhide basin. SI large pottery basin.

#### Tools and Materials for Basketry

1667. Scraper of stone flake. Hu also fingernails.

1669. Mulberry for baskets. Hu burden baskets.

1670. Yucca root (red) for design. Me in coiled basketry only.

1671. Cottonwood better than willow for baskets, SC.

1672. Willow (Salix). ST coiled and twined wares. Zu 3 kinds of willow. KP willow from Pima in exchange for yucca-leaf mats. "Baskets all black (of Martynia) if no willow available."

1674. Split stems for basketry material. ST trisplit stems scraped with flint flake.

1675. Sumac as basketry material. Me white wood, brown outer bark, green inner bark. SA both foundation and sewing material; for latter young stems hammered with cobble to make flat and limber after removing bark.

1676. Martynia for design. Me only in coiled basket. SI most baskets with pattern.

1677. Yucca leaves for basketry materials. Probably mostly narrow-leafed yucca, sometimes Spanish bayonet yucca. EN for crude baskets, not coiled. WS for coiled baskets sewing material of narrow-leafed yucca faded to yellow or white; green by keeping in shade; also smoked, then washed, for yellow. Hu green yucca useless for burden baskets as rotted quickly. Hu, Me improvised yucca-leaf basket by man. Ll narrow-leafed yucca leaves sewing material for coiled baskets, left green, but faded in time; usually as single color element, especially for coiled plaque. SA used narrow-leafed yucca. KP Spanish bayonet yucca leaves for storage baskets (Goddard, 134). HP narrow-leafed yucca.

1678. Staining or painting basketry materials. Red from boiled mt.-mahogany bark, EN, Ol, Zu (doubtful). Red mineral, SC, Ci, Ll, SI (not durable). Yellow from boiled barberry bark, Ol. Yellow mineral, EN, Ll. Black from charcoal, WN; denied by others. WS denied coloring; materials in following natural colors: white, green, black, yellow, dark red. SU black and red patterns in baskets anciently; black mineral dye (note 1291), red plant-root dye. Juniper-foilage ashes as mordant for red dye. Zu red and black dyes from shrubs; also for wool and buckskin.

#### MATTING

1679. Checker-weave matting denied except as follows: Of tule stems, Li; of sotol leaves, Li; of split-yucca leaves, EN, Li, KP; of juniper bark, EN.

1680. Twilled-weave matting denied except as follows: Of tule stems, Li; of sotol leaves, Li; of yucca leaves, EN, Li, KP. Li twilled mats with alternating double warps; thus, in one row warps together are 1 and 2, 3 and 4, 5 and 6; in next row warps 1, 2 and 3, 4 and 5, 6 and 7.

1681. Twined-weave matting denied except as follows: Of tule or cattail stems, NT; of juniper bark, SU. NT mats to sleep on (1490).

1682. Sewed mat of tule stems. Me for floor, or cover for double lean-to. EN no tule or cattail because of taboo against things from water.

#### CRADLES (LYING TYPE)

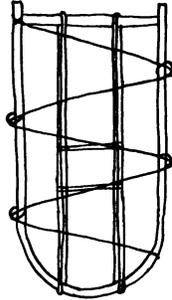
1683. Soft juniper-bark cradle, replaced monthly. SU twined buckskin wefts.

1685. Rawhide cradle. Li with movable bowed footrest, no wooden frame, no hood. Rawhide turned up at sides, holes for lacings; buffalo-calf and fawnskin bedding. Ol had perforations

along 2 edges for buckskin lacings (1721); hood of rawhide or of parallel sticks forming basketry band (1701).

1686. Wood cradle. Zu piñon wood. SA pine wood rubbed down with sandstone. SI like Zu.

1687. Wa U-shaped frame but no ladder cross-pieces; sumac verticals wound from top to bottom in figure-8 style like warps on loom. Four buckskin loops and buckskin lashings. Buffalo-hide pack strap, detachable. Frame of juniper, also crosspiece at top. Rarely cross sticks put in, making wicker weave. Hole in middle for baby's waste. (See fig.).



1689. Oval ladder cradle. EN frame of oak. ST frame of ash or sycamore, bound with buckskin where ends met. Buckskin strand across to hold shape. Crosspieces of split smoothed sotol stalk, ends bored to lash on to frame with buckskin. Five buckskin loops of finger width on each side for lacing. Hood of cradle of peeled whole Wright's willow twigs, laid parallel to form 8-in. band. Four crosspieces on under and upper sides of hood lashed (clamped) together with sinew running between long rods. Hood lined with Abert squirrel fur to protect forehead. Upper end of hood closed with 2 Abert squirrel-skins to cover top of baby's head. SC ocotillo cross sticks. Me sotol stalks for cradle bottom. Male sotol stalks for boy baby, female for girl baby. Distinguished by flowers. Stalks split in half, flat side up. Footrest of wood (1697).

1690. Cross sticks extend out; buckskin lashings. Hu split sotol stalks. KP cross sticks of saguaro ribs did not extend beyond edge of frame; lashed in place with sinew.

1692. Frame buckskin-covered at sides. Hu some cradles had buckskin strip sewed over frame; strip perforated for lacings. Some had loops (1694) of buckskin on frame instead of buckskin covering. Me, Ll buckskin covering perforated for lacing.

#### Various Details

1693. At least 2 cradles before baby walked. Minus means 1 only. NT after year cradle dispensed with and baby carried in buckskin sling on mother's back. ST 1st cradle by maternal aunt of new mother; 2d and last by new mother when baby 6 months old. SC large to allow for growth. WM 1st cradle made after baby born; new one for each baby. Hu for 2 or 3 weeks baby not carried in

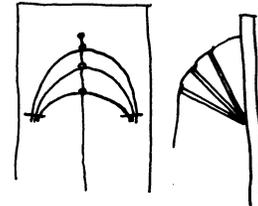
vertical position account weak neck. Zu borrowed cradle in which healthy person had lain, for health for new baby.

1694, 1695. Loops for lacing baby in cradle. EN of buckskin, attached to cradle frame. Zu buckskin loops through holes bored in edge of board. SA 2 loops of buckskin on each side for lacing in baby.

1696. SI only 1 pair of buckskin cords (1 on each side) to tie in baby, since cradle not carried on back and always in horizontal position.

1697. Footrest at bottom of cradle. EN of yucca fiber. Hu of rawhide or Apache plume wood, bowed; adjustable, moved as baby grew.

1700. Zu, SI 3 arched willow withes hinged together at ends, and collapsible, formed frame of hood; tied together with buckskin thong at middles to prevent spreading and to pull up to support removable woven wool cover; could be folded back out of way somewhat like baby-buggy hood. (See fig.)



1701. Hood a basketry band. EN of parallel oak withes. ST outer surface of hood painted red or yellow; no sex symbolism. WM of withes of wild rose, willow, or cottonwood.

1704. Hood a basketry band in checker or twill-ing. Of yucca leaves.

1705. Hood a ring of basketry material, flattened on one side. KP wove it as ring; one side flattened in attaching to cradle floor; covered with bedding material of cradle.

1706. Hood of Ll cradle 2 arched sticks supporting rawhide or buckskin cover.

1708, 1709. Skin or cloth draped over baby's face. EN buckskin preferably, or checker-weave fabric of Spanish bayonet fiber. NT antelope skin. ST fawnskin, or 5 Abert squirrel skins sewed. SC, WS, Hu, Me fawnskin. Hu also thin deer or antelope buckskin. Me beaver skin. KP of cotton cloth; no buckskin because woman handling would spoil hunter's luck.

1711. Zu put dry juniper foliage and sheepskin under woolen blanket.

1712. KP yucca-leaf-mat bedding, also head pad.

1713. Cradle bedding of loose vegetable material: Cliff-rose bark, EN, NT, ST, Ci, WM; juniper bark, WN, SU; grass, ST, SC, WM, WS, Hu, Me, Li. EN baby wet bark, dried in sun, used again. Baby wrapped in shredded bark, laced in cradle; see 1716 for other swaddling clothes. ST mashed grass to make soft. SC any soft bark or grass. WM grass below, cliff-rose bark above.

1714. Cradle bedding of animal skin. Deerskin, Hu, Me, Li, Ll, SI; wildcat skin, WS, Me, Li, SI; mt. sheep skin, Ol, SI; sheepskin, SA; buffalo skin, Me, Ll. Hu deerskin over cushion of grass.

Me buffalo-calf or fawnskin over cushion of "baby" grass from stream. SA woolen blanket over sheepskin. ST sometimes folded rabbitskin as pillow.

1715. Buckskin swaddling clothes. NT antelope buckskin.

1716. Fur swaddling clothes. Wildcat skin, Me, SI; fawnskin, ST, Ci, WM, WS, Hu, Me, Li, SI; woven rabbitskin blanket, EN; sewed woodrat skin blanket, EN; buffalo calfskin, Li, Ll, Ol.

1717. "Cloth" swaddling clothes. SU juniper-bark fabric twined with buckskin (1503). Wa, Zu, SA, SI woolen cloth. KP cotton cloth.

1720. Wound-around belt for lashing baby in cradle. KP cotton strip 2 in. wide.

1721. Tiestring laced through loops. Hu sometimes agave-fiber string.

1722. Hide pack strap of buckskin, except Wa buffalo hide. ST 2 in. wide, attached near lower edges of hood. Me extra pack strap to pass over mother's shoulder when on horseback. SU fastened to cradle through 2 of side loops (1694). KP no pack strap; cradle carried on kioho frame.

1724. Ll suspended baby in cradle from head occasionally; nothing else.

1725. NT cradle 2d strap, around mother's waist, to steady.

1728. Pendants on cradle hood. Dewclaws, Ci, WM, Hu, Me, SI; 2 wildcat claws, WS, Me; prairie dog's paws, Hu, Me; small turtle shells, WS, Hu, Me; molluscan shells, NT, ST, SC, WS, Hu, Me, SI; small gourds, Ci, WS, Hu, Me, SI; beads, WS, Hu, Ll, SI. ST clam or Conus pendants from edge of hood. WS bases of 2 wildcat claws drilled, fastened together to form crescent; bases wrapped with buckskin, bead attached. Me also tiny basket on girl's cradle, tiny bow and arrows on boy's. Ll badger claws, pebble, bone, bead. Wa when baby ca. 2 yrs. old Spanish "brass bell" on cradle hood to play with; in former times "anything" to make noise. Zu ball of yarn to keep flies from baby's face; mother now and then set it in motion.

1729. Swing or "hammock" for baby. Usually 2 parallel ropes with ends attached so hung in arc; over the ropes skin robe or woven blanket folded so edges overlapped inside "hammock" thus formed; not sewed. Weight of baby and friction of material prevented slipping. EN buckskin on 2 ropes; cradle with baby laid in it. ST 2 poles between bushes or trees; over these Navaho blanket folded; baby placed in it without cradle. SC, Hu, Me hammock of buckskin in tree, folded over 2 ropes; Hu put baby in with or without cradle. Li buckskin or buffalo robe. Ol with or without cradle. SU fawnskin hammock on 2 ropes between trees or bushes. Wa cottonwood board with holes in 4 corners for "hammock" bottom, on which cradle laid; suspended by 4 woolen ropes. Zu cradle on 2 rope loops hung from house beam with cross sticks connecting. SA "hammock" of rawhide thongs laced across oval willow frame; 2d type with similar frame with solid rawhide bottom; these fairly deep so baby not fall out; with or

without board cradle. SI ropes, or 2 parallel sticks suspended with ropes; skin or woven blanket folded over, cradle or baby laid in; one seen had ropes only tied to ceiling beams and woven blanket folded over, cradle inside. KP 2 ropes and cotton blanket; baby without cradle.

#### CORDAGE

String, cord, rope, whether merely twisted or also braided after twisting, used as cordage and not for weaving.

1730-1746. Technique.

Spinning most frequently on bare thigh; less frequently with spindle. Rope twister of wood with swinging arm (1746), although probably Spanish, was thought aboriginal by all except Ci, WM, who said modern.

1730. Rolled on thigh. EN sinew, buckskin, yucca fiber; sinew by men for bowstrings or sewing hide. ST for bowstring (1089) deer leg and back sinews pounded flat; fibers of 2 pieces separated and twisted, making ca. 20 ft. of "one-ply" cord. Then twisted 2-ply with 1 man holding cross stick, other twisting on thigh, but holding finger between plies so twist did not go too far. Ci one-"ply" for sewing, 2-ply for bowstring. Li sinew and buckskin twisted on thigh; sinew 1 to 4 plies, 2-4 for bowstring, 1 ply for sewing; buckskin 2 plies. Ll buffalo hair, sinew, yucca fiber, willow bark. Zu, SA sinew thread only made without spindle and by men. KP sinew by men and mescal fiber by women (also HP) spun on thigh with bare hand; cotton string spun on leg with spindle. Winding of string on spindle as made done by hand, not by twirling spindle on ground. Men spun all cotton, for string or for weaving. KP, HP women spun mescal string for kioho.

1731. HP men cross-stick spindle only for cotton thread for weaving.

1732. Spindle with wooden whorl for making string. SA also stone or pottery whorl. NT whorl had 3 perforations through which fibers passed. SC 1 perforation for fibers. Wa whorl of piñon wood; rolled spindle on thigh when spinning; string wound on it with spindle upright on ground; men only. SA whorl of wood, of disk potsherd, or of thin stone a little harder than sandstone. Cotton and wool string spun with spindle by both sexes. Spindle-made cord either 1 or 2 ply. After spinning 1 ply, took off spindle, fastened 2 ends to spindle, rolled in opposite direction for 2 ply. Rolled up leg for 1 ply, down for 2.

1733, 1734. Zu spindle on leg, on ground, alternative methods.

1735. ST spindle short stick with hook on end, used for doubled and redoubled spinning. Mescal-leaf fiber from dead plant macerated with stone, soaked for day to get out tissue. Fibers piled on blanket. 2 men worked. 1 fed fibers for spinning, other rolled spindle on leg. Fibers tied to hook. Spinner backed off as he worked. Doubled, and man at blanket held

loose ends while other man twisted. 3d man held middle while end men brought ends together, and spun again making 4-ply rope, ca. 25 ft. long. Soaked again. Stretched tightly between trees to dry. About diameter of middle finger. In modern times of horsehair.

1744. Scraper to free plant fibers. Wa finger-nails to remove tissue from narrow-leaved yucca fibers; sharp-edged stone flakes also. SI Spanish bayonet yucca leaves, folded, boiled, pounded, scraped for rope fiber. KP for rope, mescal leaves cooked overnight in earth oven; scraped free of tissue with deer shoulder blade, brought home.

1745. Pounding to free plant fibers. EN dried yucca leaves pounded, worked in hands to free fibers from tissue. WS, Hu same for mescal leaves.

1746. Rope twister of wood, with swinging arm, used by men only. WN buckskin. Ci, WM, Me, Ll, KP, HP horsehair. Me buffalo hair, rawhide, no plant fibers. Li rawhide; also 3-ply buffalo-hair rope, used for tying horse, better than rawhide which stretched and sometimes broke on rainy day. Ll buffalo hair. Zu wool. SA 2 men to work rope twister: 1 to swing twister, other to feed hair; rawhide also twisted with heavy rope twister which turned by hand, not by swinging. SI 2-ply antelope-, deer-, or buffalo-hide rope; after twisting, pounded with stone to soften. HP mescal fibers.

1749. Ropes of agave (mescal) fiber. 2-ply, SC, KP; 3-ply, NT, SC; 4-ply, ST. See also notes 1744-1746. NT fiber beaten, soaked, wrung out, preparatory to rope making. Hu string, but not rope, as latter too much work.

1750-1762. Materials twisted.

1750. Wa twisted hide rope on leg without aid of spindle or rope twister.

1753. WS "one-ply" sinew thread twisted on thigh by both sexes for moccasin sewing. SU one-ply deer back sinews only for sewing; no vegetable fibers twisted for thread or string. Wa, SA spun sinew on thigh.

1754. Hu sewed moccasins with 2-ply sinew. Ll also 3-ply-sinew thread. KP sewed buckskin shirt or sack with sinew or buckskin (1755).

1755. Wa sewed cotton bags with buckskin.

1756. KP human-hair rope to tie kioho net to hoop framework; mescal fiber if no hair, hair preferred because softer.

1759. Yucca fiber. Ll Spanish bayonet yucca leaves wilted over fire to extract fibers which twisted into 2-ply cord. Wa 2-ply cord, rolled on thigh without spindle; when used for sewing, fibers not spun. KP yucca fibers not strong enough for string.

1760. SC sheets of inner willow bark for wrapping packages.

1761, 1762. Wool and cotton spun with spindle by Zu women.

1763. Yucca leaves for tying. Pounded whole leaves (not twisted), EN (sometimes), NT, ST, SC, Ci, WM, Wa, SA, KP; wilted over fire to make pliable, EN, Ll, SA; split leaves, all except Ll,

Ol. EN Spanish bayonet yucca leaves tied together in emergency for packing load. Wa spine of narrow-leaved yucca burned off, leaf split.

1764-1778. Braiding.

1764. Zu braided rope for lashing wood bundles.

1765. Braided buckskin. Me for bridle reins.

SU hunter wore 3-strand rope around waist, for packing deer. Wa 4-, 5-, or 6-strand, after soaking in water; 2 forked posts supported crosspiece to which attached to keep taut as braided.

1766. Braided rawhide. Me, SA rope and quirt; elkhide sometimes. Wa "rawhide too stiff to braid."

1767. Plant fibers braided. Ci sometimes yucca leaves in play.

1768. Buffalo hair braided. Me bridle reins.

1772-1777. Number of strands braided. WN 3, 5, 7, 9, 11 for use on horses. Ll 3 of own hair on head; no other materials. Ol 3, 4 commonest. Hu 4, 6, 8 for rawhide quirts.

1779. Withes. WN oak. SA willow or grapevine for tying shade, or temporary.

1781. Nets. KP held string in bundle and passed through loops to tie square knots. Mesh gauged by eye. HP finger knot.

1782-1784. Knitting. Thought aboriginal by all but EN. WN 4 needles. Wa greasewood needles. Zu knitted stockings "ancient."

#### WOVEN RABBITSKIN BLANKETS

(1785-1800)

EN warps of yucca-fiber string on 4 stakes few inches above ground. ST rare, for baby only; weft of cliff-rose bark. Wa rabbit hides moistened in sand, torn with fingers by women; twisted over black and white wool yarn. Warps separate pieces tied to top and bottom loom beams. Wefts same material, in balls inserted by hand, 4 women worked seated, passing ball. Zu rabbitskin blanket on regular loom, without batten sticks, shuttle, etc.

#### LOOM WEAVING

(See notes 1785-1800 for use of vertical loom for rabbitskin blanket.)

1802-1803. Cotton fibers. Wa, Zu, SA, SI picked out seeds. Wa carded fibers with stick. KP seeded with bowstring, snapped to hit cotton pile.

1804. Wool fibers. EN mt. sheep before domestic sheep; note 1853.

1805. EN informant thought spindle Mexican.

1810. Women spun. WN carding first operation learned by girl. SI both sexes spun cotton thread with spindle rolled on leg.

1811, 1812. According to "historically" minded EN informant, weaving from Pueblos who got from Spaniards who used horizontal loom. Then Navaho got idea of vertical loom. In grandmother's time wove on vertical loom.

1813. Men weave. Wa some did not learn till married. SA informant wove blankets and twilled mantas.

## POTTERY

1814. Women weave. EN men wove first; after "Mexicans" came, women. Miscellanea concerning weaving: Age begun, WN 6, EN 11, Wa 12, Zu adult, SA 9, SI puberty; teacher, Wa, SA, SI, KP man, who might be novice's father, grandfather, etc. (Wa).

1817. Sometimes side posts of loom frame forked at bottom too; EN.

1818-1820. 3 poles at bottom of Wa loom: 1 imbedded, 1 lying on floor with perforations for buckskin lashings to attach lower blanket pole (1823). Weaving in kiva, rarely in dwelling. Zu buried beam with braided horsehair loops for attaching bottom blanket pole.

1821. SA loom attached to juniper-withe loops set in floor. If loom on 2d floor, loops passed through floor and around ceiling beam of room below. SI oak loops.

1827. Sometimes each warp separate piece, SI only.

1829. Zu end strands twined with fingers.

1840. Wa temple with greasewood "pin" at each end attached to blanket edges with string.

1841. SA when weaving too high reversed ends of blanket.

1841a-1847. Wa belt-attached loom for belts only; hair cords, garters, sashes on blanket loom. SA belt-attached loom for belts for women, garters for men; vertical blanket loom for sashes for male dancers. Zu sometimes used big toe as fastening for one end of sash loom. KP belts and sashes on regular horizontal loom.

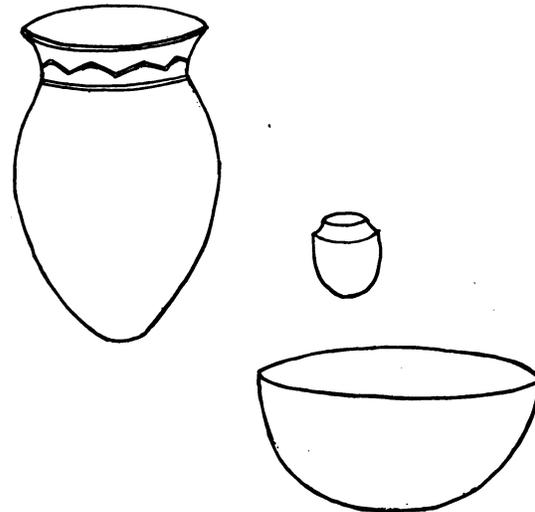
1843. Warps carry design. SA warps for belt weaving (see fig.), to form part of pattern. After laying out around stakes, attached to wall stake and to weaver's waist.



1853-1857. Horizontal loom. EN men wove mt.-sheep wool blanket on horizontal frame like rabbitskin blanket. Men spun wool with spindle, whorl of pine bark. No weaving swords, etc. KP loom warps secured with loop tie at each round of yarn beam, of wood other than saguaro. (Cf. Russell, p. 151.) Loom 3 or 4 in. above ground. Batten stick turned sidewise to separate sheds. Needle 1 ft. long. After weaving, loops over yarn beams cut and tied together. Sometimes 2 men worked together. Informant had seen only 1 loom worked, when 7 or 8 years old. Weavers specialists. When person wanted cloth woven, he supplied cotton for it. 2 bushels of wheat or maize payment for 1 cotton blanket. No color weaving.

1861. Only women made pottery. SU made no pots, none by trade, but pots from ruins for water and boiling. Ol pots to Mexicans for agricultural products and salt, going to Mexican villages to trade; bowls, handled cups, ladles, cooking pots, etc. Informants in all groups which made pottery had seen it made. Li, Zu informants (women) had made it.

ST pottery black. Women got red or buff clay from bank. Dried 2 days in sun. Ground on metate. Winnowed in basket to rid of coarse material. Mescal-leaf juice, prickly-pear-root juice, boiled salmon-globed mallow root mixed with clay, water added to make paste. Basket of paste kept covered to prevent drying out. Knee-moulded base set on grass. Coils rolled and added. Potsherd for scraping. 2 sherds, inside and out, for smoothing, dipped in boiled decoction of mallow root. Pot dried 2 days. Firing with any wood piled to top, more added, until pot cherry-red, then cooled. Potter worked alone lest crack and break; no man, woman, or child might come near. If pot cracked prima facie evidence someone had watched. ST only group which bound rim with fibers to strengthen. 3 shapes of ST vessels figured. Cup had recurved rim by which held. Bowl 2 ft. diam. Cooking pots 1-3 ft. high.



Clay broken on stone by pounding or rubbing with another stone. Following only said done on metate: WN, EN, NT, ST, SC, Ci, WM, WS, Hu, Me, Ll (doubtful), Ol (doubtful). SI informant had seen it ground on metate at Acoma. KP beat clay with stick on hard ground. HP pounded on rock, shook in basket to separate fine from coarse, tested in mouth to make sure fine enough. WM potter's clay from Kushtishto (clay water), ca. 10 mi. S of Black r. Hu women sampled clay with fingers wherever they went. Ll mixed clay with warm water. Ol yellowish clay.

1863. Sherd tempering. Wa cooking pots. Zu ground on metate.

1864. Sand tempering. Wa cooking pots. SA only metate-pulverized pumice, if no satisfactory sand available.

1865. Whitish mineral powder for tempering. SI dug on hill ca. 2 mi. from village, on E side Rio Grande.

1866. Vegetable material for tempering. ST note 1861: from roots of 3 species of prickly pear. SC sticky flesh of *Mammillaria* (?) cactus. Ci, WM, Hu, Me flesh of low cactus, not *Opuntia*. Li leaves of shrub ca. 3 ft. high.

1867. Wa no tempering in Sikyatki-type ware; gray clay burns yellow.

1872. Coiling. SC spiral. WM concentric. Ol only rolling of clay for trimming edge of vessel, otherwise pot formed from single ball of clay.

1875. Pot scraped. WS gourd or sherd. SA scraped with wood, then gourd; set in large open bowl to protect and make easy to turn.

1876. Pottery smoothed. Gourd, WM, WS, Hu, Wa, Zu, SA, SI; sherd, NT, ST, WM, WS; other material, EN, ST, SC, WM, Li, Ol, Wa, SA. EN pebble; if no pebble, charred maize cob; if too thick, rubbed down with moistened pebble; not scraped. NT vegetable wash on exterior to make smooth and hard, applied with sherd before firing. ST note 1861. SC smooth stick, also small stones. WM tapped lightly with small gourd on inside, while hand supported outside. WS after drying, rubbed inside and out with macerated *Opuntia* leaf. Hu sometimes hand held inside while exterior patted gently with flat stick; no scraping, but smoothing with hands dipped in water. Li bit of wood and fingers. Ol maize cob and pebble. Wa slightly abrasive pebble after gourd smoothing; then wet and polished with smooth pebble. Zu red clay, sun dried, concave base for pot to rest on while working. Piece of gourd to smooth new coil attachment, inside and out. 2 days to dry, then polished with pebble.

1879. Polished with pebble. See note 1876. Wa before and after slip applied. SI after drying. HP pebble or smooth shell dipped in water; care not to let wind strike drying vessel.

1880. Wa applied slip with fingers. Zu with yucca fiber. SA, SI, KP, HP with rag or wool (SA). Zu white slip from Laguna; white before and after firing, applied with narrow-leafed-yucca brush. Polished all day with pebble before applying design. Separate brushes for pigments. SA white slip burned white; from place between Santa Ana and Sia. HP red slip material from Imika.

1886. WN only polished after firing; seems doubtful. EN coated inside and out with piñon pitch after firing. ST boiled wood rat or other meat with much salt in new pot to insure against cracking. Zu coated exterior of plain cooking pots with pitch, then rubbed with "barrel-cactus" pulp. Li pots unslipped; red, sometimes black. Hu, Ol brown.

1887-1892. Painted designs. EN mixed mineral pigments with decoction of boiled yucca leaf. White used by Wa burned white. Zu syrup from boiled narrow-leafed-yucca fruit and stalks for

pot painting. SA red, buff (yellow), and black for design colors; black mineral burned black. KP mineral red, boiled mesquite sap black, applied after firing; fixed by toasting near fire. Also golden-yellow mineral pigment applied after firing remained yellow. HP mesquite juice (not boiled), toasted on by refiring. Soft stick to apply design (1897).

1893. Indentations or incisions. With thumb and (or) fingernails, ST, Ci, Ll, Ol. EN indented dots with end of stick.

1894. Molded ornaments or parts. EN thin roll of clay for raised wavy design on neck. KP handles on cooking pot. HP ears or lugs for handles.

1895. Ring design broken. Wa lest prevent childbirth.

1898. Yucca-leaf brush. EN Spanish bayonet yucca for applying red and black geometric design. Zu narrow-leafed yucca.

1899. WS stick to incise marks near top of pot.

1900. Firing in open fire. EN let pot cool for 2 or 3 days before removing. HP fired in slight depression.

1901. KP fired in pit to guard against wind, vessel on stones.

1902. Hu made only cooking pots, not placed vessels on side to fire lest collapse.

1904. Pot fired bottom up. SA on stones. SI now on iron grating.

1905. Wood or dry foliage for pottery firing: juniper wood, SI; juniper foliage, EN; oak wood, WS; Hu; any wood, SC, WM, Hu, Li, Ll, Ol, HP. Hu preferred oak. NT put small sticks inside when firing. Li deer hair and grass inside. KP palo verde wood preferred, dead cholla cactus. HP cattle dung and wood.

1906. Sheep manure firing fuel. Wa start fire with wood chips, then sheep manure. SA cattle manure only. KP now also cattle dung.

1907. Smoke firing (bucchero) with manures. Sheep, Zu, SI; cow, SA, SI; horse, SA, SI. Black ware among Apache accidental: NT, ST, WM, Me (some black, some reddish). Ll ware reddish brown with black blotches. Wa knew bucchero method but not used. Zu sheep manure over red-hot pot to make black cooking vessel. SA vessel red hot with cattle-manure fire, then smothered with horse manure. SI earlier firing with juniper wood, then dried manure added, and, when red hot damp manure for smudge.

1908-1911. Moulding or modeling. WN small bird figures. ST unfired figurines of baby in cradle or of horseman made by potter for children. SC birds and mammals. WS unfired dolls, animal figurines. Hu small unfired figures made by children. Wa modeling on spoon handles only. Zu owl jug to carry water to fields. HP small figures: doll, man, tortoise.

#### GAMES

Football or stick race, 2 sides.--Not in element list: Wa game in which players lay on back.

Maize cob wrapped in ball of yarn with foot-long projecting knotted string, caught by string between toes. Start and finish on kiva floor. First throw attempt to hurl ball out of kiva hatchway. Hurlled over prescribed course back to kiva. Inter-kiva contest.

1912. Number of runners on side: 3-4, Zu; 2-6, KP; 4-6, EN; 8, WN; 10, Ll; any number, Wa, SA, SI. WN learned from Hopi.

1915. Stick race along straight course and return: WN, KP. Along straight course without return: EN, Ll. EN course any distance. KP ball kicked around marker, e.g., horseman, back to start. Distance run: 3 mi. WN, EN; 6 mi. SA, SI; 20 mi. Wa, Zu, KP; 200 ft. Ll.

1917. "Ball" touched only with foot. EN leader kicked stick; if missed, player behind kicked. Wa no turning back to kick stone; if missed, next man kicked. KP ball removed from bush or cactus with hand.

1918. Short stick kicked. EN 2 1/2 in. long, 1 side red, 1 black; other team yellow and white. Zu stick with median red mark; other red marks middle and ends.

1919. Wooden ball kicked. KP palo verde; emergency ball carried; tradition of stone balls. Kicked toward goal; opponent tried to stop with straight stick; if failed, kicking side had another kick. 4 on side. Goals 100 yards apart. No clan, moiety, or village alignment.

1925. Sides "summer-winter" moieties. Sometimes Tewa of Hano contest between winter and summer kivas.

1926. Sides are local groups. WN sides represented places, not clans. Wa runners from various kivas, not evenly matched.

1927-1930. Goal. Ll stick, stone, or bunch of grass.

Four-base game.—Distinctively Apache, but not Ll, Ol. Suggests baseball, but only hand to strike ball. Fullest account of game from ST. 4 bases about 60 ft. apart. One was "home." 2 teams. Big circle enclosed bases; both teams stood within. Opposing pitcher threw. Anyone hit. All ran to 1st base. Ball of maize husk. Pitcher threw again and they ran to 2d base if ball hit. Ditto 3d and home. Opposing team tried to get ball and throw to hit player. If done teams interchanged positions. Entire team must make home run. Any number girls (not women), boys and men played.

SC called naziakwe. Each base a ring drawn on ground, on which entire team stood. If one struck with ball, team went into field and opposing team tried to run bases. WM drew rings on ground for bases, home base largest. Me wet one side of ball and tossed it to determine which team to have bases first. Me allowed 4 strikes at ball thrown by one pitcher.

1931. Approximate number in team: NT, ST 8; SC 9; Ci 5-6; WM 5-9; WS 3-10; Hu 2-12; Me 4 up; Li any. Number of home runs to win: NT 10; ST, Me 5; SC 4; Ci 3-4; WM 3-5; WS, Hu, Li not fixed.

1939. Ball of buckskin. NT filled with chewed mescal fiber. SC, Ci mescal. WM juniper bark. Hu grass or mescal fiber, ball 5-6 in. diameter. Me hair.

1943. Foul line behind home base. WM foul to bat ball backward over shoulder; if struck at ball and missed, and it hit body, team out and other team took base. Hu if batter made foul, his team lost base and other team took bases and batting. Li men on bases to home base on foul.

Three-base game.—Too American in style to believe with SI informant that it is aboriginal. SI name, punambihe; Mexican name, "ilesia." Field triangular, bases at corners. Wooden bat, buckskin ball stuffed with buffalo hair. All of one team behind base line. One man tossed ball, another hit with bat, then ran. Opposing team scattered over field to catch ball and tag runner. If reached base, safe and another of his team batted ball and ran. If runner tagged with ball caught and thrown by opposite team, his entire team out. Played until tired. No betting. No winter-summer opposition.

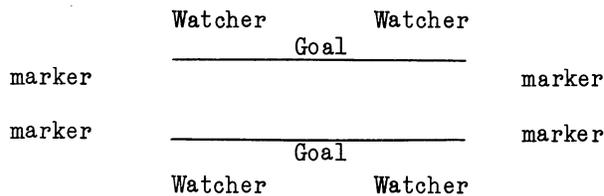
Foot racing without "stick kicking."—

1950-1951. Racing by individuals, not in teams. ST on flat 100- to 500-yard course, returning to starting point; spectators wagered buckskins, etc. SC besides races, kicking-tag game by boys. Me racers might sweat. KP racers' faces painted.

1952. "Relay race" by teams. Questioned Ll, Ol about relay race described by Goddard (p. 180). Both seemed reticent. Formerly held near Chamita in Ol territory; Ll went there for occasion. Ll, Ol camped apart, usually 6 days before race. Race track below hill on left side of Rio Chama facing upstream. Flat-topped shade as booth at each end of 350-ft. race track. Log drum with skin head at each. No flag on pole in old days, but 2 ears of maize (any color) on each pole. Nowadays red (Ll) and white (Ol) flags; no direction associations with red and white. Informants did not know about sand painting in booth; had never been in booth or been runners. Only racers and officiants admitted to booths. No pole climbing. No clowns. No saint's image. Race 1 day only about Sept. 15. Preliminary run on day before. Old man in charge of each team and preparations, not chief; different one each year. No betting on race. Losers pelted winners with food. Purpose: "just a fiesta for good time and reunion of relatives." Tradition that Ll and Ol once together, then separated, but annually reunited at relay race. Even number men on each side. Each team in 2 groups, one group at each end of course. The instant one racer reached end of course a partner at that end started back to opposite goal. Bronco busting, horse racing, etc., but main event relay race.

KP relay race with movable sticks to mark crossing place of winning and losing runners. Markers

moved from both ends of field. When these crossed one another the game was won by the side whose lead had caused moving of markers.



"Shinny," evenly matched sides.—Number in each team: WN ?; EN, WS, Me, Li, Ll, Ol, Wa, Zu, SA, SI, KP any; NT 6; ST 4-10; SC 10-50; Ci 6-7; WM 5-6; Hu 6 up; SU 8. SC called game nabekale; field about 150 yards long; each side chose rough or smooth side of ball, then tossed it to determine which to have first strike to start game. SA boys also played. KP not true shinny; squash-knob ball, straight stick, boys only; no goal; aim to touch opponent with it; if successful, each player picked it up and threw it at victim.

1955. Sometimes men played shinny against women. WS, Li, SU.

1958. Shinny with 2 wooden balls tied together. KP women; sides villages.

1959. Stuffed buckskin ball. Me deer hair. Ol stuffed ball of rawhide. Wa, SA wool. SI deer or buffalo hair.

1965. Driven with curved stick. ST any slightly curved stick.

1967. Guard stick carried, to prevent opponent hitting ball while player drove it. EN curved. WS, Hu straight.

1968. Ball driven with feet also. ST against rules, also dangerous lest hit with shinny stick. WS, Hu rule against kicking sometimes waived. SA player well ahead with ball might use feet more than stick.

1970. EN, Li covered bush goals with skin blankets. ST 10 goals to win game; i.e., 10 to 0 subtract score, not 10 to 6, etc. Ci drove ball around bush. WM bush at each end of field; ball driven against one bush, then back to other to make goal.

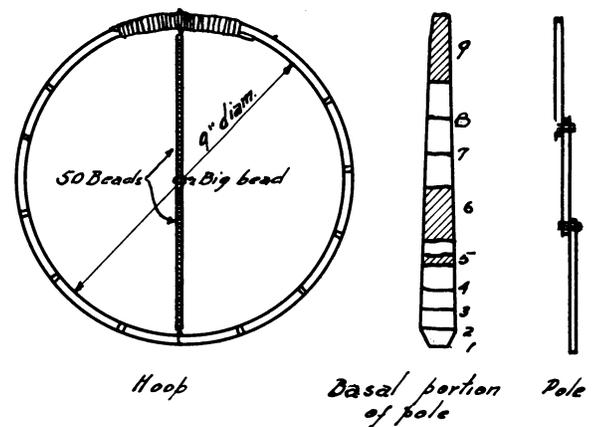
1971. Rocks as goals. Wa rock piles into which ball driven.

1972. Sides members of 2 kivas. SI no "winter" and "summer" kiva teams.

1974. Betting. WM sometimes bow and arrows. WS various things.

Hoop-and-pole ("pitching pole").—ST account of equipment and game fullest (see fig.): 9 encircling grooves in proximal third of pole colored red; in opponent's pole uncolored. To count, hoop must contact proximal third. 10 notches each counted 1 point each, binding made 11th. Buckskin strand across diameter of hoop had 50 thin buckskin wrappings on each side of center, called "beads." Knot in center called "big bead." 101 "beads" altogether. Umpire judged position of hoop and pole. Diameter of hoop just sufficient to include pole marks 1-9. If hoop enclosed 5

marks on pole counted 5 points. Counting on hoop only when proximal portion of pole rested on hoop notches: 1 point for each. No. of "beads" on string in contact with proximal part of pole



counted as many points. If string of "beads" lay lengthwise along pole, 101 points scored. 112 maximum score for 1 throw. Play to 50 to 150 points agreed upon in advance. Score by subtraction. Only 2 men played at time. Informant declined to talk about dreams in connection with game, or any medicine or ceremonies.

1976. Hoop plain, not netted. Me hoop lashed together with sinew, with overwrapping of buckskin. Sometimes each ring notch counted 4 instead of 1 in scoring.

1978. "Beaded" (wrapped) cord across hoop. Me cord red.

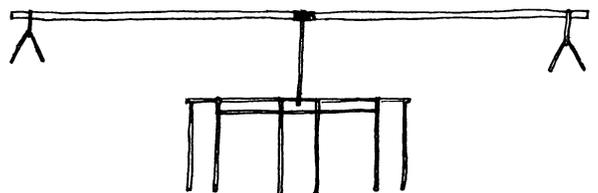
1979. 101-123 "beads" (wrappings) on cord across hoop. NT, ST 101; Ci 101 or 121; WS 121; WM, Hu 102 or 122; SC 123. SC 61 wrappings on each side of big center "bead." Ci 50 or 60 "beads" on cross string plus big "bead" in middle; pole about 12 ft. long.

1980. 21 "beads." Me 10 "beads" or wrappings on each half of cord plus large one in middle which counted 100, making total 120.

1981. Hoop of Spanish bayonet yucca leaves. EN "supposed to be bull snake inside wrapping of hoop." 1 lump on hoop for counting. In casting pole, might try to knock opponent's aside.

1984. Pole spliced in 2 to 4 pieces. 2 EN. 3 NT, ST, SC, Ci, WM, WS, Hu, Me, Li. 4 Ol. WN juniper wood. Me parts lashed together with sinew; notches on proximal part; each notch on pole and hoop either uncolored, red, or black. Ol spliced with sinew; 2 notches in proximal segment.

1985. Pole buckskin decorated. (See fig.) EN scored game if hoop lay on all six center



buckskin cords; 2 if over either of terminal pairs; 5 if over joint of pole; 1 if over 1 string.

1986. Course with ridge in middle. Ci 2 double courses each with 2 side ridges, 1 center ridge. Courses about 50 ft. apart. Poles thrown before ring fell flat (also WM).

1991. Sometimes poles cast in turn. Ci, WS, Hu, Me, Li only.

1995. Number of points to win agreed on. EN if 5, wagered buckskin; if 10, horse or "chief blanket." SC 50 or 61. Ci 50, 60, 70. WM, e.g., 71; formerly bet arrows, buckskins, etc.; latterly horses.

1996. Number of points to win fixed. WN 8 points: each successful throw scored 2; 4 in succession won game. Ol counted on fingers, total carried in head; 20 was game.

1999. Sometimes 2 players on side. SC, WM. Sometimes 3, WM.

2001. Dreams about hoop-and-pole game. SC apparently not of sexual nature. Ci about lucky person portended success; bad dream failure, dreamer declined to play; dream about animals or water-being were bad. WS dreams about women indicated good or bad luck; also direct dreams about game; twitching indicated success or failure. Hu dreams about game good or bad; if bad, not play.

Related to hoop-and-pole.—

2002. Netted hoop (children's game). Me boys shot arrows at hoop. Li boys and girls, 2 1/2-ft. stick through center hole counted 10 and won wagered objects; through other part counted 4. Winner tapped each opponent 4 times on forehead with fingers. 8, 4, or 1 in team. Thrown sticks marked for ownership. Yucca-fiber "net" on hoop.

2003. Shooting arrow at rolling hoop. WN, Me boys' game. SI yucca-leaf hoop; men and boys; wagers laid; no summer-winter kiva competition.

2004-2007. Ring-and-pin game. Li who went to Mescalero reservation in 1904 had ring-and-pin game from Mexicans. SU jack-rabbit or cottontail-rabbit skull; no score, no betting.

2008. WS boys' game of throwing up Opuntia leaf and catching on sharpened sotol stalk.

2009-2010. Hu cup-and-ball by children only, no scoring; one ball only; 1 cup only. SA shinny stick to keep wool-filled buckskin ball in air; no sides. KP arrow with maize cob on point thrown by hand; man with stick split in 3 parts caught it; 4 arrows for each player; game kuyuwitan.

2011. "Shuttlecock." Zu boys' and men's game of throwing maize cob, sharp stick and feathers attached, at grass ball; first to pin grass ball won; no scoring circuit. SA maize cob with feathers on one end, sharp stick on other; thrown in air; not game with sides.

2012. Maize cob and hoop (boys' game). Wa maize cob with sharp-pointed stick at one end, 2 feathers at other, cast at rolling ring 12 to 15 in. diameter, wrapped with pieces of old blanket, so point would stick. Must hit while rolling.

Ring sometimes of grass. Each played for himself. No scoring with counters, remembered score. No betting. Boys in row; each threw as hoop rolled by.

2013-2033. Peon or hand-game.—Lacking among W Apache and apparently intrusive among Apache groups which had it. Navaho regarded it as variant of hidden-ball (moccasin) game.

WN "peon" game with one pebble hidden in hand behind back. 2 players on side. 102 count as in moccasin game. EN pebble hidden and guessed for. Boys and girls. 2 bids on each side. Count as in moccasin game. Regarded as children's variant of moccasin game of which 3 forms: hand, sand, moccasin.

Me thumb signal for both left or both right; hand vertical for inside 2; spread thumb and index for outside 2. Both hidden pieces alike: rings, pieces of wood, bone, etc. If missed both, lost 2 counters; if missed 1, lost 1 counter. Total counters 12.

Li mixed sexes played. Bones of type on bone breastplate. Only one bone used by 1 player. Signal same as Me form of game. 4 points won game. No stick counters.

Ll, Ol played as winter pastime. 1 to 12 men on side; 1 bone marked, 1 unmarked. 12 counting sticks: 4 short ones on each side, 4 long ones which held first by side which began guessing. 4 long sticks worth one short one and could be so exchanged in case guessing side lost all 4. To win, team must have 4 long and 8 short; long must be won first. Guessing side supposed to have long sticks to pay for misses. If miss one, pay 1; if miss 2 white bones pay 2 long sticks. Payment always in long sticks. If guess both white correctly, got the bones and other side did guessing. No sex names for marked and unmarked "bones." Ll sometimes arranged under blanket.

Zu regarded hand-game as variant of moccasin game. Only 2 played. Hid anything in hand, sometimes piece of bone. If guessed correctly, guesser kept object, e.g., knife. SA men only played; 2 sides. Each player had 1 short stick with 4 burnt marks on each side. Guessed right or left. 10 stone counters in middle at start. Ten arrows bet which winners got. SI with only 1 bone. Opponents guessed right or left, then holders exposed hands called for. Any kind of bone. Might indicate guess by pointing right or left. Sometimes women. Number of counters agreed upon by contestants, not fixed (SI only).

KP 4 players on side, each with stick. Counters in middle at start. Pointed to right or left in calling hands. Changed sides only when all 4 guessed right. "2 right 2 left," "1 left 3 right," etc. Loop on each stick over middle finger to prevent cheating.

Hidden-ball game.—

2035-2040. With sand heaps. "Ball": pebble or

stick, EN, SC, Ll, Zu; head of deer femur, Hu; wooden ball, Ll; yucca-root ball, EN, NT, ST, SC, Ci, WM. Sometimes only single guess allowed: EN, SC, Hu. NT only set up stick for each game won. Counters: EN 102; NT, Ci 40; ST 25; SC 14; WM 26; Hu 104; Ll 54.

Methods of playing, negative and positive. In negative seek to eliminate empty piles. In positive seek ball on first attempt.

EN negative method: hit ball first, lost 10; on 2d trial lost 6, on 3d trial lost 6. If eliminated 3 successfully took ball. In positive seeking, with ball at B, if player hit A he lost 6, C 6, D 10.

A B C D

If ball in end position (A or D) and player guessed wrong end, he lost 4.

ST 4 mounds of earth. Ball of yucca (Spanish bayonet or narrow-leafed) stalk, ca. as big as fist. Teams from different camps. Visitors started guessing, hosts hiding. 7-10 men in team. Fire in center, where umpire sat. Hiding behind blanket. If ball kept going back and forth no counters given. Umpire passed counters; one side must get all 25 twice in succession to win. Game took all night. Men and women mixed played in winter. Wagered quiver, moccasins, buckskins, later horses.

SC played with pyramid, 4 piles (in row or square), or played in "valley" with 2 ridges. One stick lost in 1st or 2d wrong guess, 2 in 3d.

WM counters pieces of Spanish bayonet yucca leaf. Tossed yucca-root "ball," to 1 side marked, to decide who began. Guessers consulted as to location of ball, then sent man over to guess. First two hidings in 2 piles by each team, no counters passed. Then 4 piles; negative method. Played at night, central fire.

HU femur-head of horse, etc. Boys only. Counters as in WS moccasin game. Pointing stick held horizontally if ball sought at first (positive); vertically if last (negative). Positive losses 10 and 4 depending on position of ball; if missed twice, ball rehidden. Negative loss 10 only once, namely if hit ball before last pile. Negative option losers might avail selves of in both sand-pile and moccasin games.

Ll lost 4 counters each wrong guess. 15 counters and ball for right guess. Each side 27 counters.

Zu stone, black on 1 side, red on other, thrown up to determine which side started hiding. Sometimes game lasted 6 days. 2 keepers of counters called "rats." Squealed when got counters. Played with sand piles in camp, with wooden tubes in pueblo. If with moccasins, counted same way. Positive loss 4 counters each miss. Negative loss 10 if hit ball at 1st, 6 2d, 4 3d.

2041-2047. With 4 moccasins buried. Ball hidden in one. WN, NT only set up stick in ground for each game won.

WN hid piece of wood called "man." 100 small

yucca-leaf counters 1 point each; 2 large ones 10 each, last to be won. Played in winter.

EN in winter, account snakes and bears in summer. Which team hid ball first settled by casting die representing sun, 1 side black, 1 white. Game taught by giant son of Sun. 102 yucca-leaf counters stand for 102 sky roads sun travels. With moccasins used stick to strike with instead of bare hand of sand-pile method. Either positive or negative. If hiders forgot where hid, opponents entitled to pebble. Variant 3 moccasins with 6 and 4 count only, no 10.

NT missed 3d guess lost 3 sticks, if right got ball and no stick. Counters, 40.

Ci from "Chiricahua" Apache after Geronimo captured. WM first, then Ci, who played slightly. WM claimed game as ancient.

WM guessed in which hand grass held; correct guesser started game. "Ball" top of deer femur. 5 long sticks 10 each, 56 smaller sticks of yucca leaf 1 each. Buckskin to hide behind. Started with 2 moccasins as in sand-pile game, not counted. Then 4, counted. Moccasins corked with juniper bark. Hit moccasin with short curved stick. Lost 10 if missed ball by two moccasins, 6 if missed by one (positive method). If won, got ball. When one team reduced to few, say 18, counters, then negative method. Wrong on first lost nothing, on 2d 6; on 3d 10. Counters, 106.

WS ball top of beef femur. 5 notched sticks 10 each; 54 plain 1 each. Positive striking moccasin 2 removed from ball cost 10 counters, 1 or 3 removed 4 counters. Negative ball obtained at 1st lost 10; 2d or 3d lost 4. Sometimes with holes instead of moccasins. WS, Hu, Me, Li use 104 counters.

Me 1st struck to determine which side to begin hiding pebble. When plenty of counters, struck once, then rehid if missed, which counted 10. When counters low, negative "not here," "not here"; if hit first time, lost 10. But if eliminated 2 blanks then guessed wrongly as to 3d, nothing lost. 5 notched sticks 10 each, 54 plain sticks 1 each.

Li count identical with Me; piece of bone as "ball."

Ll lost 1 narrow-leafed-yucca counter each time missed; 10 counters and ball for right guess. Only positive guessing. No blanket concealment. Guessers went away while arranged. 1st, 2d, or 3d guess got ball. Counters distributed at start; 26 in all.

SU from Navaho; not played in informant's youth.

2048-2056. With 4 tubes. SI used 50 or 100 maize-grain counters; KP 80. Wa cottonwood tubes; white stone hidden. Men only, usually interkiva. Bit of maize husk, blackened on one side, tossed to determine who hid first. Positive guessing with right hand, negative with left. Former "ball" at 1st guess, latter at 3d. Only 1 point against player for wrong guess. Right guess took "ball." Counting registered

losses, not gains. Counting "board" 10 parallel lines on floor or ground, in 2 groups of 5. For team to win game, opponents must lose 10, so their counting stick had been moved through 10 spaces on counting "board." Right guess on their part moved stick back to start. Each side's counter stick placed between lines in recording losses; 2 watchers moved sticks.

Zu 4 tubes of cottonwood root with black ring around top, all alike. Grass stems, as in meal brush, for counters.

SI stick hidden in tube. Tubes called "old man" (zigzag burned line), "2 men" (# at both ends), "swollen man" (X in middle), "man" (# at one end). Negative, if got stick 1st time lost 10; 2d 6; if failed to get stick 3d lost 4. Might wager blankets.

KP cane tube "old man" black checker pattern; "old woman" zigzag. 3d tube encircling central line, no name. 4th marked around bottom end. Hard red seed hidden. Negative guessing. Positive also allowed: correct 1st took ball. 10, 6, 4 order of losses in wrong guesses. Men only.

#### Drawing straws.—

2058. Drawing straws, boys' game (longest sought). Me men, women also; winner took objects wagered. SU modern; absent in informant's youth. Another game, not listed as element, SI 3-5 boys on each side hunted hidden object. Hiders said: "Your arm is burning," or "Your foot is burning," when seeker close to object.

Dice games.—Played with 3, 4, 8, 12, and 16 wooden staves or dice among Apache. Perhaps elaborated by Apache, since only 3-stave game widespread in Southwest and even it lacking among Papago who played only 4-stave game. 3-stave game only form among Navaho, Pueblo.

2059. With wooden staves. SA informant knew nothing about, but interpreter (Jose Sanchez) played 3-stave game as boy about 8. Mrs. Sanchez, SI woman, had never seen game. Jose never saw old people play, thought intrusive. Split-willow sticks, not marked, as staves. All flat up 10, all bark side up one. 2 bark up 2, 1 bark up 20. Scoring circuit of 40 stones, with gap every 10 called river. Played partners, 2 on side. Scoring stick back to start if stopped in place occupied by opponent's. Landing in "river" did not force scoring stick back.

2060-2078. 3-stave game. Sometimes more than 2 sides: Me, Li, Wa, Zu. Safety spaces (2069) automatically determined by count scale.

WN dice of cottonwood root. Flat side black. Round side natural. No design. No sex name. 4 persons played.

NT painted flat side, 2 red "women," 1 black "man." 2 players only. Counted opposite directions. Intervals of 1, 4, 6, 7, 8, 9 "safe" (2069). "River" across scoring circuit. If scoring brought counter into river, it returned to start as though "killed" by opponent.

ST 4 (2 men, 2 women), or 3, or 2 played. Players sat around flat stone on which staves thrown. Scored in opposite directions. 4 played as 2 pairs of partners, so only 2 counting sticks. 3 10-inch wooden staves, flat on one side, round on other. Flat painted red. Players sat around flat stone on which staves thrown.

SC 2 sides, 1-3 persons on side.

Ci staves 1 ft. long; flat side black mark (sometimes red). 2 pairs of partners played. Intervals of 4 and 6 "safe" (2069).

WM flat side of staves marked alike, round unmarked. 2 pairs of partners on opposite sides of stone counting circuit counted opposite directions. Player could take less than scored to stop on safe spot not reachable by opponent's next throw. 4 circuits to win game. Count 1 or 2 for one marked stave up agreed upon at beginning.

Hu "rivers" oriented.

Me -1 for one marked stave up, player moved back counting stick 1 space; only throw by which single player sent opponent back to start; also if this put own counter into "river," must go back to start. If playing partners, 6 or 10 throw, landing counter with opponent's, sent latter's back to start, but if playing singly did not. Each 10 throw gave another turn. Sometimes threw 4 tens and won game at once. Option of counting less than throw to avoid falling in "river," except for -1 throw.

SU not present in informant's youth.

Wa 1 side of staves black, all alike. 4 main spaces called "gaps," not "river." Did not go back if counter landed in one.

Zu counted right or left. Round side of staves red, flat plain. Counting stick called "horse." Even if in river, "horse" sent back to start if opponent's landed in same place.

Si if landed in river "dead" and must return to start. Stick marker called "horse." If landed on same place as opponent's "horse," latter "killed" and returned to start. Each player counted right or left as wished. Flat sides plain, counted nothing. Round sides notched, counted according to 10, 6, 4 notches.

2079-2095a. 4-stave game. Contact of staves counted also.

NT 3 red staves "women," 1 black "man," painted on flat side only. 120 charcoal marks on buckskin "board" for count. Staves thrown on stone. 3 red up (5 each), black up (20), not touching, counted 35. 3 red down, black up and touching one red counted 30 (20 for black up, 10 for contact). 6 contacts (3 reds touching one another and black across all 3) with 3 red down counted 80 (60 for contacts, 20 for black up).

ST 4-stave game counted on marked buckskin or Navaho blanket with 40 red hematite marks in circuit, with "rivers." Staves, 18 in. long, with flat and round sides, thrown on stone slab. 3 red "women," 1 black "man." Many people sat around, betting, shouting when good play. Players, 10 independent, not partners. Player took fewer points than scored if saved him being put back

by opponent's next throw. All 4 alike counted 10; 3 red up, black down 12; 3 red down, black up 12; 2 red up, 1 red down, black up 2; 2 red down, 1 red up, black up 3; 2 red up, 1 red down, black down 2. All painted up, black lying across 2 reds 22; all painted up, black lying across 3 reds 30. Each man's scoring stick marked by thumbnail to recognize.

SC dice not called "man" and "women."

WM counted on marked buckskin. Long staves, 3 red and 1 black on flat sides. Not called "man" and "women." Black across 1-3 red counted 20; 3 red up, black down 13; all marked up 5; all blank up 10, crossed or not.

WS rawhide "board." Staves, no longer than those of 3-stick game; black, yellow, white, blue; counted, respectively, 50, 30, 20, 40. 10 added for crossings.

Me 1 marked, 3 plain. 3 plain flat up, marked round up 7; 3 round up, marked flat up 6; 3 round up, marked flat across 6; all round up 10; all flat up 6. 2 sides only. Sometimes partners.

Li 1 stick with X on round side, black on flat side; 3 others red on flat side. All alike counted 10. 3 red all flat or all round up, but differently from X stave, counted 7. Played partners sometimes. Sometimes played with Co-manche who had same form.

KP 2 games: one women's, gomai; other men's, kis. Women's dice marked on round side, men's on flat side. Women's all red, or all black. Women's count: all round up, 10; all flat up, 5. Counted by drawing line on ground for every 5 points; 10 lines to win. If no scoring throw, passed dice to opponent. If 5 or 10 got 2d throw.

KP men's 4-stave game counted with square of 41 small holes in ground. 2 or more players used stick markers. All counted to right, beginning with 5 holes at 1 corner of square. 1st to make round then counted to left. "Killed" any he met. 82 points (2 rounds) made game. This for individual players only. If 2 village teams, 5 additional holes on opposite corner making 46 in all. See Culin, figure 167. Only 1 marker for each team. Staves described precisely as pictured in Culin, figure 165. His "a" called kis (value 15), "b" gi'K (value 4), "c" du (value 6), "d" siko (value 14). All round up counted 10; all flat up 5; 2 round up, 2 flat up 2; 1 round up, 3 flat up 3; siko flat up, 3 round up 14; gi'K flat up, 3 round up 4; kis flat up, 3 round up 15; du flat up, 3 round up 6. When met opponent's marker spoke of "killing," not of putting "in river."

KP variant of men's game called ahati; likened to "checker" game on ground. No dice thrown. 41 holes as in dice game. Man said: "I'm at 15 (10,2) hole," as he wished. The idea was to move marker so opponent could not touch, i.e., by taking advantage of automatically safe positions. Could move only the 8 counts mentioned above (2,3,4,5,6,10,14,15).

2099. 12-stave game. ST staves 18 in. long, painted only on flat side; 6 red "women," 6 black "men." 1-6 little marks on round side of

each set had to do with count. Played with shallow basket. Smooth ground covered with buckskin. Dice thrown up in basket. All must land in basket. If 1 fell out, play spoiled and player lost turn. Remembered 2 of combinations, but not scoring: all red up, all black up. Others forgotten.

2102. 16-dice game. SC dichenkas. Dice 1 1/2 in. long. Black, blue, yellow, white on flat side. Men usually, women sometimes. Bet on different colors at each throw. Scoring in head. Score agreed to play to. Scored by subtraction. Color making score first won. Black "chief" 10, blue 9, yellow 8, white 7. All black up, all others down, counted 10; all black up, all yellow up, red down, counted 8; other counts not remembered.

2105. "Cubical" die (deer kneecap). WS, Hu 2 played. Aimed to land on edge. 1 player selected curved edge, other straight edge, like "heads and tails" in flipping coin. 6 stick counters held by each player; each laid out counter before throw. Lucky player took both. Me on edge to count. Scored with 10 or 20 sticks, maize kernels, etc. Success gave player another throw. If missed, opponent threw. End up counted 5, concave edge up 2.

#### Various games.—

2106. In game vaputta KP children in 2 lines with leaders; anything hidden in hand.

2108. Zu flipped stone for heads and tails to determine start of any game, but not as game itself.

2109. Jackstones. ST men. WM children. SI sometimes 10 jackstones instead 5. Acorns sometimes; walnuts, WS, Hu, Me.

2113-2116. Top spinning. Me with string from Mexicans. Ll, Ol with string thought ancient; boys formed teams; aimed to work wooden ball toward goal by throwing top to strike ball. Zu piñon wood top with string. SI piñon wood, double pointed; with string.

Finger spun without string: WS sometimes oak or mesquite wood. Me, Li acorn. Li yucca-root top with stick through spun by rolling with palms of hands. Zu like small spindle. SA pine wood. KP stick in morning-glory seed.

2117. Sliding arrows. WS on smooth ground; if feathers of 2d thrower's arrow touched opponent's, he took both; if not, first thrower cast another arrow. SI arrows on ground near line shot at with maize-cob-ended arrow; those knocked over line became property of shooter; also shot ordinary arrows, shooter claiming his opponent's if feathers touched.

2118-2122. Cat's cradle. WN, EN in winter only when spiders not about lest bite. ST one form "making hut." Zu girls mostly. SA informant denied game; interpreter played it, but did not remember where learned. Li besides cat's cradle, puzzle game with loops or rings of grass, played by adults and children.

2123. Juggling by young women. ST also by men, 4 stones. Me walking. Li walking to goal and return; adults and children. Ol 2 balls of leaves. SU 2 clay balls by women young and old, walking;

no score. KP finale of jackstone game (2109), counted 10 if successfully done. Juggling by children also, SC, Ci, WM, WS, Hu, Me.

2128. Quoits, in hole. Throwing stone at stake instead of hole modern innovation at Wa. Zu women only. SA, SI men only. ST played it with convenient natural stones, 4 men with 2 stones each, 2 on a side. Hole at each end of "field." 2 men stood at each hole and pitched stones. Both in hole counted 10; both hanging over edge 6; 1 in and 1 hanging over edge 8. On side 2. 1 in and 1 on side 6. 1 half in, 1 on side 4. Scored by subtraction till score 20 to 0. No counters. SC 2 partners at each end of field. WS holes at each end of field marked by stakes. Both stones in hole counted 4, stone on edge counted 1; score by subtraction. Me subtraction score, on edge of hole counted 2, in hole 4. Twelve points to win. Sometimes played partners. Wa quoits at maize cob, set up; knocked over with stone. Derived from Zuni 30-40 yrs. ago. Old way threw one stone, tried hit with others. Zu man bet he could run around village before woman got stones in hole. KP with flat stones.

Ll attempted in vain to describe 4-hole game with pebble in each; holes in row, 2 outer ones at limits of reach. Player swept hands toward center and brought pebbles together. Game of skill? 10 sticks as counters on side which did not have stones at start.

2129. Buzzer toy. Of flat material; two perforations through which cord passed. Operated by first swinging so doubled cords intertwined, then pulled from both ends to set "disk" in motion. Momentum of whirling disk twined cords in opposite direction; pull on the cords then spun disk in opposite direction and rewound cords, and so on. Materials for "disk": Deer "wrist" bone, flat nearly circular bone in which holes bored (NT, ST boys' toy). Deer's kneecap (WM, buzzing sound made by toy supposed to sound like Apache words for "deer here, deer here, deer here"; WS; Hu; Ll denied kneecap). Leather (ST modern). Hide (SC). Rawhide (Me, Li, Ll, Ol). Wood (Ol; KP saguaro rib). Pumpkin rind (Ci with sinew cord, Wa, Zu). Gourd (SA; SI with buckskin thong). Pottery (SA). Selenite (SA).

2131-2134. Archery games. (See also 2002, 2003.)

2132. Distance contest. SU cane arrow with hardwood foreshaft, no head. Wa older men, from mesa top; also height shooting.

2133. Stationary target. WN an originally shot arrow; closest won original arrow. Ci, WS, Me Opuntia leaf. WM ball of willow bark in tree. Li buffalo chip at 60 yards. Wa target shooting often after planting party, farmer inviting men to bring bows and arrows. Man with hoe set up bone on stick. Each shot, then hoe-man set up further on; so on till home. Also such shooting elsewhere by 2 teams with 2 targets. SA ball of yucca leaves; those who hit target got arrows of those who missed. SI maize stalk lying or stand-

ing. KP tried to shoot arrow so lay across first archer's, thus winning first.

2134. Moving target. WN something soft which arrow might penetrate. ST ball of willow leaves tossed in air by boys. All arrows pooled beforehand. Each shot all arrows. Those that hit ball kept. Those that missed went back into pool. SC ball of weeds rolled on ground. WM ball of willow bark. WS ball of yucca leaves. Hu ball of leaves thrown up; cactus fruit rolled. Me, Li trimmed disk of Opuntia leaf rolled. Me yucca-root ball; winner claimed arrows of those who missed. Also yucca-leaf ball thrown in air. Ll disk of Spanish bayonet yucca leaves rolled. Ol rolled ball of yucca-root stalk. SU rolled ball of shredded Spanish bayonet yucca leaves. SI willow-leaf ball rolled or thrown in air. KP shot at thrown-up target, winner got losers' arrows.

2135. Warfare games for boys. Often involved human target who dodged missiles. Shooting with bow and arrow: EN at mark. ST, WS Johnson grass stalk shot at boy target carrying shield. Hu blunt arrow. SA arrow dodging by boys and men; after 4 shots, archers and targets changed places. With sling: NT, ST game. Zu boys slung mud at each other from end of stick. Wa stone dodging as war practice by boys; Wa versus Tewa boys; parents watched. With blunt spears, hurled: Hu.

2136. Wrestling. WN whole body down was loss, no matter whether back, side, or belly. Grip around waist.

#### TOYS

2137. Popgun toy. ST informant suggested possible origin of popgun and of pea shooter (2138) from knowledge gained in cleaning tubular sticks for flageolets. If inventions arose in this way would constitute examples of free mutation (Harison, 113).

Popgun of elder wood, etc. NT, ST popgun (suna) ca. 15 in. long. Chewed mescal fiber shoved in with stick a few inches from distal end. Then another plug fitted tightly in end. From proximal end stick shoved in, forcing out mescal wads, and making noise. WM, WS, Li young men and boys, wads of chewed mescal. Li elder, or of pine sapling burnt through; grass wad popped out. Zu, SA sunflower stalk. SA cane, KP cane with saguaro-rib plunger.

2138. Pea shooter. Of 2 types: (1) operated with breath, (2) operated with spring. Type 1: NT maize kernels blown, but never darts. ST maize kernels blown; also plain stick without broad butt, which did not go far; toy. Zu pebbles, maize kernels, beans from 10-in. cane tube; no sticks. Type 2: Recorded for SA only. With bent



willow twig fastened in cane to form spring for discharging wooden "bullets." End of spring goes

through lower side of cane. Bullets lie in open 2-in. channel. When end of spring pushed up it released, snapped forward and threw out bullet.

2140-2145. Dolls. EN none, lest child sicken. Wa none other than kachinas; cradle on which little girl put chipmunk, rat, squirrel, etc., skin. Zu pine-wood images of gods given children.

2142. Dolls carved from cottonwood, NT, Hu, Zu; from juniper wood, NT; from willow wood, WM; from other wood, Hu, Me, Li, Zu; from yucca root and leaves, Ci, WS, Hu, Me. Of yucca leaves, Hu, Li; of grass, Li. None of yucca root or cottonwood, Li.

2143. Dolls of clay. SC, KP unfired. Li children made clay figures, sun-dried; bigger girls made dolls for smaller. Zu soot on clay dolls for eyes, hair.

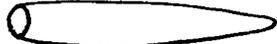
2144. Dolls of animal skin. Of buckskin, WS, Hu, Me, Li, Ll, Ol. Zu animal figures of stuffed buckskin. SI stuffed squirrels skin with grass, red yarn for eyes; no human dolls or cradles. Ll doll of scraps of buckskin, stuffed with grass.

2144a. Imitation hair for doll made of buffalo hair. Me, Li, Ll, Ol; of agave fiber, WS, Hu. Li used buffalo-beard hair.

#### PIPES

2148. Elder as substitute for cane, SC, Li, KP (doubtful). SC maize stalk and wood also. Zu for ceremonies, priest smoked cane tube, yellow-lily flowers mixed with tobacco; blew smoke on maskers. KP cane or hollowed plant stem.

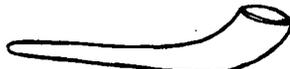
2150. Tubular pottery pipes. Men made, ST, Ci, WM, Ll. Women potters made, Ol. EN not very satisfactory. ST dried for day, fired; grass or



twig inserted for stem hole, pulled out when dry or burned out. Ci fired; smoked when men assembled; man with tobacco had pipe, not every man. WM fired; men gathered at house of man who had tobacco; he filled pipe, passed it; each man took 4 puffs. Hu few men who owned pipes visited by others to smoke; not for prayer. Ll, Ol stem of clay also. SI pipe of stone or clay, latter with protruding ornament (see fig.); cane or elder stem.

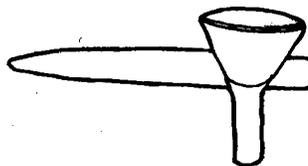


2154-2159. Elbow pipe. ST of pottery, smoked only by owner in daytime. At night others might



smoke at gathering. Reason others could not smoke in daytime was because sun-given pipe and only owner knew use in day. Took one puff, blew smoke toward sun, saying: "Good luck, sun." Another elbow pipe in form of cross (see fig.). In making, interior smoothed with twig to reach stem opening. Turquoise or jet pendant on pro-

jection below bowl. This pipe ceremonial; obtuse and tubular pipes not; all ca. 5 in. long. If clay stem broke, cane substitute. Hu clay stem and bowl.



Me pottery bowl, cane or elder stem. Also deer leg-bone "elbow" pipe with opening on top for bowl. Li pottery. Wa clay including stem, made by men; some with cane or willow stem. Me elder substitute for cane stem of pipe. SU no cane, probably elder.

2156, 2157. EN described turquoise and white shell elbow pipes with cane stems.

2161, 2162. Cigarettes. Maize-husk wrapper (WN, NT, ST stored husks for winter, WM, WS, Me, Li, Ol, Wa, SA, SI, KP, HP). Oak-leaf wrapper (EN, WS, Hu, Me, Li, SI). Sotol-leaf wrapper (Hu; Me and Li from leaves of sotol stalk). Opuntia-leaf skin (Me).

#### TOBACCO

Me only asserted that chewed as well as smoked in aboriginal times.

2163. Wild tobacco gathered. SC called natasoti. WM few men had, others visited such and sometimes waited as long as hour and half before owner offered smoke. Ol none gathered, tobacco from Mexicans. Wa brought home, dried in sun.

2165. Tobacco smoked mixed with other plants. ST 2 plants: chuchupata or ocha and another shrub. SC 3 plants: bidaichi; bishnatol; haichide, root of water plant of Umbelliferae. WM root of water plant haikiye, and smaller plant "like celery." WS several kinds of leaves and roots including haichide of SC; piñon needles, juniper foliage. Hu chuchupati root, juice of another plant, leaves of third. Me 3 roots, 3 kinds of leaves, including chutapati root, sage leaves; when praying tobacco only smoked, cigarette usually. Li 4 or 5 kinds of roots and leaves. Ol one root. Zu note 2148. SA leaves of ya'a (Spanish lemi), leaves of another bush. SI no plant, but deer or buffalo fat.

2166. Tobacco cultivated. EN wild-tobacco seed planted where found. SC, Ci, WM wild-tobacco seed after burning brush where it grew, not on farm. SC tried growing Mexican tobacco in Wheatfield valley near Miami, failure. Wa wild-tobacco seed scattered in fall. KP wild tobacco not planted; fox tobacco, did not grow wild; planted in rich soil on farm. Fox got this tobacco from its selfish owners in "beginning of world" for use of humanity. Preferred to wild tobacco.

2168. Mt.-sheep-skin bag. ST only scrotum of mt. sheep, buckskin sewed on to form upper part; drawstrings; worn around neck. In late times bull scrotum.

2169. Whole fur bag. EN cased skin of ground or tree squirrel. NT Abert's or ground squirrel

skin for tobacco and sinew containers. Ci ground squirrel. WM Abert's squirrel or fawnskin, carried at belt. SI small river mammal, black and gray, whole skinned.

2170. Buckskin bag. SC adult deer or fawn buckskin; bag called notose. Li also rawhide. Ol not embroidered with porcupine quills. SA antelope or deer buckskin.

2171. Clay pot, etc. Ci sometimes stored in small cracked pot in cave; carried in cane tube by warrior. Hu sometimes in trinket basket (1658). WM in small stone-covered pot in cave or rock shelter.

2172. Gourd. Wa with skin lid sewed on it; hung on wall.

2174. Wa old women members of certain religious societies smoked.

2175-2177. Young men smoked. EN only married men; saying that young man must first have captured a coyote refers to marriage, woman being "coyote." NT began smoking at 15; theoretically should have killed 4 coyotes. ST not allowed to smoke till 20 or 21; made short of breath and heart pound too hard. Said jokingly to boy, "If you run a coyote down and catch it by tail and then release it, you can smoke." SC, Ci young man might smoke "after he had caught first coyote by hand and brought home alive." WS boys and girls smoked in praying against sickness. Young people cigarette; old people clay pipe. Hu did not because shortened breath; if young man smoked, it was said he had already "caught a coyote." Li boy must "catch coyote and slap him under tail" before being allowed to smoke. Zu besides fictitious "coyote capture," young man allowed to smoke after killed a Navaho.

2178. Ceremonial smoking. ST pipe passed clockwise, each man taking 2 puffs. KP council meeting time for general smoking.

2180. Daytime smoking. Wa on return from fields, before eating.

## MUSICAL INSTRUMENTS

### Rattles, etc.

2181-2185. Gourd rattles. By shamans in curing: WN, EN, NT, Wa, Zu, SI, KP; for dance accompaniment, WN, EN, Me, Li, Wa, Zu, SA, SI; in peyote ceremony, Li (modern). EN, NT shamans only used. Li gourd rattle (gourds from "Spaniards") modern substitute for buffalo-horn rattle. Ll gourds from Mexicans. Wa gourd rattle for baby's toy, sweet maize kernels within; for other purposes pebbles. Zu, SI shiny white stones from ant hills; Zu other white pebbles too. NT, Me seeds from tree; Me also cherry pits.

2186. Buffalo-horn rattle. Li when eating peyote; latterly gourd rattle.

2187-2188. Turtle-shell rattle. Wa leg rattle with deer hoofs attached counted also as deer-hoof rattle (2195). Zu leg rattle with deer hoofs inside and (or) outside; also turtle-shell hand rattle with deer hoofs inside; holes

in turtle shell not plugged. SA leg only, deer or antelope hoofs attached to turtle shell. SI deer or antelope dewclaws or hoofs attached outside. Tied on calf, less often in hand. Dewclaws removed by boiling, perforated with knife while soft. Holes bored through top and bottom of turtle shell, dewclaws attached to top of shell with buckskin strings; loop on bottom for holding with hand or tying to leg. 4 dewclaws on boy's example seen. Man's as many as 10.

2189-2193. Hide or bladder rattle. Hide rattle for curing, WN only; for dance accompaniment, Me, SA only; Me for social dance only. WN buffalo-hide rattle formerly, from Ft. Sumner, New Mexico; nowadays cattle hide; shape ellipsoid; pebbles within. Me buffalo hide; only group using seeds inside. Zu only bladder rattle; from cattle, for boys; no hide rattles. SA painted cattle-hide rattle yellow; none of buffalo or deer hide.

2195-2197. Deer-hoof rattle. WS, Hu wooden handle with buckskin thongs on end, each with mule-deer-fawn hoof attached. Me one seen had hoofs of male deer on end of short buckskin-wrapped stick; mt. sheep or calf hoofs sometimes. SU now used by some shamans; innovation from Navaho. Wa see note 2187. SA sheep and goat hoofs for children's rattle. SI hoofs on end of stick.

2199. Notched rasp. WN in "feather dance." Ol informant claimed Pueblo introduction. Zu notched stick scraped with deer cannon bone; stick laid over pumpkin shell for sounding board. KP notched rasp accompaniment to singing in purifying salt gatherers. Not for dances.

2200. Coiled basket scraped with stick. Zu certain societies scraped with notched stick. HP shaman scraped with plain stick.

### Drums

SU drums modern, pottery drum latest. Improvised drum by stretching rawhide over pit; other groups lacked practice. KP drums innovation from Spaniards.

2201. Basket as drum. WN beat with rattle. EN beat only with plaited yucca-leaf drumstick. Ll, Ol beat with girl's moccasins at puberty ceremony.

2206. Straight drumstick. Li used for wooden-bowl drum, tambourine drum. SI used for all types of drums.

2207. Hollow-log drum. SI hollowed cottonwood log with fire.

### Bull-roarer

Dimensions. Length in inches, 6-12 (Zu), 8 (WN, EN, SU), 9 (Ci), 10 (NT, ST, SC, Wa, SI, KP), 12 (WM), 15 (Ll), 18 (Hu). Width in inches, 1 1/4 (EN), 1 1/2 (WN, SC, SU), 2 (NT, ST, Wa, KP), 2 1/2 (Ci), 3 (WM, Hu, Ll, SI), 1-5 (Zu). Length of cord in feet, 2 (WN, SU), 2 1/2 (Hu), 3 (NT, SC, Ci, WM, Ll, SI), 3 1/2 (ST), 4 (EN, Zu, KP), 5 (Wa).

Special wood for bull-roarer: pine (NT, SI); piñon (Zu); juniper (SU); ash, gaspome (WM); sotol-stalk base (Hu); saguaro (KP). WN only claimed edges of bull-roarer notched.

2209. Small stick on cord for grip. WN loop-ended cord instead.

2211. Design on bull-roarer. SU one side black (charcoal), other red (mineral pigment). Wa lighting design both sides. KP red dots both sides.

2213. Used out of sight. WN not sound if used in public. SI in kiva; women not see.

2214. Used during dance. ST, SC, WM clown whirled bull-roarer to announce masked gan impersonators, after that whirled during dance. In SC curing performance witnessed, bull-roarer came off string twice, retrieved by spectators.

2215. Used for curing. EN if bull-roarer came off cord or did not sound, sick person doomed. NT shaman swung toward 4 cardinal points before entering patient's house. ST shaman carried in little pouch under belt; when much sickness, shaman went in order toward E,S,W,N and whirled bull-roarer to drive away. KP sick from lack of purification after Vigita ceremony (2944) cured by someone (not shaman) swinging bull-roarer over him or her.

2217. SU stopped excessive snow by "causing wind." Man took snow bath, climbed hill or tree, swung bull-roarer. When finished hung on tree.

2218. Bull-roarer as toy. ST also as boy's toy; cord wound up on leg, then instrument whirled. Ll men and boys as toy; women might see it used.

#### Musical Bow

2219-2222. Musical bow. ST boys only; end against teeth; tapped with stick; mouth opened and shut to vary tone. Ci, SI boys only. Hu tapped with arrow or picked with fingers. SU tapped with arrow; mouth as resonance chamber; amusement only. KP for purifying sick person; string rubbed; not put against resonator. Me also fiddle with 3 sinew strings on hollowed mescal stalk with 4 openings beneath strings; bow equipped with horsehair on which rosin used; aboriginal (sic).

#### Whistle, Flute, Flageolet

2223. Single-bone whistle, Me, Li eagle wing-bone whistle on buckskin string in battle to summon spirit aid. SU for decoying rabbits; note 13

2225. Bone tube blown over. KP to purify sick person, not by shaman, but someone else who knew songs. Wildcat leg bone, no side hole. End blown over.

2226. Cane whistle. EN for turkey hunting. Me for battle. Wa for ceremonies only. Zu for turkey decoy. SA cane-whistle toy on Christmas morning; end stuck in water and blown, making sound like bird. Thought to be aboriginal. Made by men.

2227-2234. Flute. end blown. EN flute, only

shaman used. Ll, Ol called flute and flageolet shesonz; flute earlier, flageolet after "Spaniards" came. Ol, Wa pointed flute downward when playing. SU flute or flageolet (?) modern. Length in inches: 12 (Hu), 15 (Zu, SA, KP), 18 (SI), 24 (Me, Ol, Wa), 30 (Ll).

2228. WN sunflower stalk only for flute. Ll sometimes as substitute for cane. Me wood as well as cane; sometimes elder.

2229. EN 4 or 6 holes. Holes in cut-out spaces by Hu, sometimes by Ol. Others denied cut spaces.

2230. Spacing of flute holes governed by convenience in fingering. Only Ll in pairs (specimen seen): holes ca. 3 in. apart, spaced so both hands required to play. Holes 1 and 2, 3 and 4 closer than 2 and 3. Me holes 3 finger widths apart; cut or burned.

2231. KP only in courtship. WN only by children only.

2233. At dances. Wa flute for ceremonies only. Zu only priests; cane imported from E; flutes now in use are old.

2234. Decoration of flutes. Painted, Hu, SA, SI, carved, Hu, Me, Ll, Ol, SI; pyrographic, Ll, Ol. Hu geometric design in black and red. SA yellow.

2235-2243. Flageolet. W Apache, WS, Li flageolet instead of flute; Hu, Me, flute instead of flageolet. Fullest description, from ST: of cane or elder, ca. 15 in. long. 3 burned holes ca. 1 1/2 in. apart. At joint in cane near mouth end, holes burned on either side of diaphragm, connected by groove. If elder wood, some pith left to serve as inside reed. Over proximal portion of grooved hole finger might be held as reed, or strip of buckskin tied. End blown. Between mouth end and reed pyrographic pattern of 2 diamonds connected by zigzag line; same on underside. Elongate diamond pattern of dots burned between holes, also on underside; transverse, not lengthwise. Elder tube cleared of pith with stick and breath.

WM elder formerly; "bamboo from Mexico" nowadays. Li flageolet played by men only; no playing with nose.

2236. Reed of wood, gum or pitch, or pith. Ci, WM when elder used, pitch for reed. NT, ST some pith left in if elder used. Ll, Ol wooden reed tied on outside of flageolet with buckskin string.

2238. External reed of buckskin. Ci wrapping on cane and elder flageolets. WS wrapping adjusted for sound.

2240. Convenience only in spacing holes of flageolet. WM for 3 middle fingers; ca 1 1/4 in. apart.

2242. Courtship use of flageolet, Ci, WM, WS, Li. Before hunt (WS), before prayer (WS, Li), by shaman (Li). WS played to Nayitizone or other god before prayer for war or hunt. Sick person might ask owner to play and pray for him.

2243. Pyrographic decoration. WM butterfly decoration, nowadays with hot wire. WS wavy longitudinal lines, but not sure if painted, carved, or burned.

## CALENDAR

With apparently all groups new moon in W marked new month. ST, Me, Zu volunteered month comprised 30 days. EN associated stars with months, i.e., certain stars rose during certain months. Planting and ripening marked by risings. New Year began September (maize harvest), WM; October (winter), EN; December, Wa; January, Me (doubtful), Li (doubtful), SA, SI; spring, WN, NT, Ll, Ol; June (saguaro harvest), KP; July, ST.

2244. 4 seasonal names only. Ll, Ol (1) tax, spring (everything new); new year began with sprouting of vegetation in spring. (2) chi, summer (warm). (3) taxye, fall (everything ripe). (4) hayi, winter (snow, cold).

Seasonal names from other groups, who had month names too.

SU. Fall, yuwanit (leaves turning yellow), winter, düma (heavy snow), spring, tamanit (snow melting), summer, tachat (leaves coming out). 3 spring months only (March, April, May) had separate names, in order: tamadowich (warm days beginning); tamagum (green grass appearing); tamabi ("mother" of 2 preceding months). No other month names obtained, but additional seasonal designations, apparently synonymous with above: summer, bachamato (much warmer for growing things); fall, yuwanmatuhut (leaves yellow and falling); winter, dümamatumut ("hard times month"; people indoors). No new year observed.

SI. Spring, tohandi (February-March), summer, payogedi (warm), fall, hoyedi (little cold), winter, hawengepo (to put everything together). Special names for 3 winter months: hawengepo (see above), November; odjipo, ice month, December; payachondi, new year, January.

2245. Descriptive-type calendar. EN. ha<sup>d</sup>dji, half (some green vegetation, some snow); October 13, 1935, in this month. <sup>i</sup>schiskosi, little wind and cold. sassen't'ê, "cook the snow" (very cold, but sun glazes snow). atsayaz, eagle laying. woschin, deer shedding horns. ka<sup>n</sup>chil, plants appearing above ground, or pin feathers on eaglet. ka<sup>n</sup>so, plants getting big, or eaglet feathers getting big. yaschaschide', wild seeds getting ripe (Pleiades not visible). yaschascho, wild seeds all ripe. minita<sup>n</sup>stozi, maize getting silk. minitatso, maize getting ripe. mininas'at, go deer hunting (more or less synonym of ha<sup>d</sup>dji, sometimes intercalary).

NT. dizkisê', sun shining on one side of mt., shady on other. istahaskê't, hawks angry. binyisidesket, so hot that meat rots. binninichê, paint face red. binniinchan, everything gets ripe. akêsa', deer getting fat. lâzi, cold on one side, hot on other (July 29, 1935, at beginning of this month). kombatatka, cold around the fire. zasentez, snow cooking. istabizaz, young hawks. bôischê, owl singing. istanasil, plants sprouting. Informant doubtfully identified month 1 with March; however, month 7 corresponds with ST month 2 (August), which would make NT month 1 February.

ST. His face ripe ("his" referring to world);

year begins; July. Half cold, half hot (one's body when sleeping by fire); August. Fall (all turns yellow and red); September. Fire to edging up; reference to person; October. Snow roasting; November. Hawk babies (hawks call then); snows about middle of this month; December. Owls call; January. Leaves slim (leaves begin to grow out); February. Leaves cooked (greens cooked in this month); March. Mt. shady on one side (sunny on other); April. Hawk angry (about his young); May. His face meat rots; "his face" is sun's face. His face red (world with ripe fruits); June. Informant said: "We counted only 30 days in a month in old times, not 31 like white." Maize planted in 10th month. July 19, 1935, in month 1.

SC. Informant knew only minintan, in which August 4, 1935. Meaning: "everything ripe." Evidently equivalent of NT month 5 and ST month 1.

CI. Informant knew only biniziche: maize nearly ripe; Aug. 22, 1935, in this month; bininascho: maize ripe; the following month. Former evidently NT month 4 and ST month 13; latter NT month 5 and ST month 1.

WM. binistanchu, maize ripe; begins about September 1. ladji, sleeping under one blanket, head to feet (because "not much blanket yet"). kopanaskat, cold around the fire. zatisted, cooking snow. isabidjas, young hawks. muschi, owl calling. danachin, grass sprouting. danatso, grass getting big. shashke, bear rutting season. inichididchik, meat rotting in one day. binidiche, cactus blooming. binitanchese, maize silk hanging down; August 19, 1935, in this month.

WS. Informant knew a few month names, but not order or time. About same meanings as Me names: young eagles, evil face (a winter month), blankets on around fire, etc.

Me. ichibanuwutzi'che'e, mammal fetus (deer, buffalo) thrown away (because hands too cold). Alternative name shinakache: going toward summer (in reference to sun coming northward); January. isabicha, young eagles; February. itanachila, grass, buds, sprouting; March. itanatzo, big leaves; April. nitakudanya, soft ground appearing as snow melts; May. ikae'ka, narrow-leafed yucca flowering; June. nesanchile, little fruit; July. chunadi<sup>i</sup>, plenty of rain; August. takhehaye, like spring weather, but cold; September 13, 1935, in this month. nigunchile, fruit spoiling; October. binyenchide, cold snaps occurring; November. biza<sup>n</sup>ko<sup>a</sup>, fire on top of mt.; December.

Li. Informant knew no native names, gave following meanings: January, cold month (around fire); February, young eagles; March, grass sprouting; April, leaves sprouting. New year began at winter solstice. New moons marked on buckskin by old men and women; no pictures.

SU. (Cf. note 2244.)

SA. Apparently month names not limited to six, but informant could not remember all. January, yu'mitsitstawa, arm-cut-off month (in reference to everything frozen); March, kanohtawa, juniper pollen month; April-June, hawwitanatawa, maize stalk months.

SI. (Cf. note 2244.)

KP. Month called ma<sup>he</sup>. Year began with ripening of saguaro fruit in late June or early July. 12 months, of which informant remembered only 10: asenipahi, ripening of saguaro; yutkemti, rain time; sopüüsta, short planting; vihaihi, beginning of cold; küsüpihi, somewhat cold; güsüpihi, very cold; gomachima<sup>he</sup>, gray month; kyutekima<sup>he</sup>, green month; kwammakt<sup>a</sup>, yellow month (flowers); ko<sup>ke</sup>ma<sup>he</sup>, something hurting (provisions low).

2246. Six months repeated. Zu only employed 6 month names twice in year. New year began at winter solstice, determined by sun priest. Months in order: tayamcho', tree leaves frozen and breaking off with weight of snow; onanulak-yakwamme, getting warm so snow dried quickly; sowana, "no meaning"; kwashitamme, "no name"; ssistekwatkeklana, big wind (October 19, 1935, in this month); ssistekwatitsana, small wind. Repeated for 2d series of 6 months.

Besides Zu with only 6 month names, solstices apparently of calendrical value to Li, Wa. KP informant said: "Everybody knows about solstices and talks about sun coming back." EN shamans kept track of solstices. At sunrise of summer solstice placed basket of maize pollen where rising sun's rays touched it. The instant they did it was snatched away; purpose? Solstices recognized in month count on knotted string: six knots for one half of year, six in another series for second half of year; knot tied with appearance of each new moon.

2247. Ceremonial-type calendar. Recorded only for Wa: chamuya, month of not pounding because of ceremonial singing (stayed home at night); bamuya, month of social dances and games; buwamuya, month of quiet (no social dances; remained at home minding own business); üsumuya, cactus (üsü) clan ceremony month; wiyamuya, month of setting up windbreaks for watermelons; hasitunmuya, month of waiting anxiously to plant maize; memahusmuya, month of early maize planting ("teparies" also planted this month); usmuya, real planting month (end of June); imanmuya, home dance month (solstice month, "July"); bamuya, month of social dances and games (second month named bamuya); natamuya (month of everything ripe); tuholmuya (month of carrying home the harvest); chelumuya, month of initiating little boys (November 8, 1935, in this month). New year began with winter solstice, in month chamuya.

2248. Day tally kept. EN, NT day tally marked on rocks. NT informant knew old man (not captive Pima) who kept day tally of each month on rock, white stroke for each day. Me kept two 180-day counts on notched stick or marked buckskin. One count began with month 9 (takhehaye), other with month 3 (itanachila), apparently from equinoxes, not solstices. Also 30-day-month count with knots in buckskin. Old men quarreled over month designations. ST no day tally, but counted 30 days of month in head. Hu charcoal marks on hut pole to keep track of expected return of relative. Zu

member of shalako kept 40-day count with knotted string after planting of prayer sticks at springs. Untied 1 knot a day. At end of 40 days a ceremony.

2249. Month tally. EN notched sticks and knotted cords for month count. SC, Ci, WS, Me knotted cord. Li only (marks on buckskin). SC, WS, tied knot at beginning of each month; WS buckskin cord.

2250. Notched calendar stick (year count). WS notched calendar sticks sometimes by woman to mark age of child. Informant's mother kept one for him, hence able to tell him he was 26 years old when taken to San Carlos, Arizona. Also as marker for other events, such as big assemblage of people. Notches marked with clay, red, yellow, black, blue. Me Plains tribes and Mexicans warred so much on Me that calendar records lost, memory of details gone. KP calendar stick seen was saguaro rib 6 ft. long. Record of 92 years from 1935 back. Record covered 1 side and ca. a foot on other side. Grooves colored with mineral red cut completely across to mark years. Space between grooves carved with mnemonic symbols, charcoal rubbed in; some were X, E, A, N, H. Meaning of symbols known only to annalist.

#### ROCK PICTURES

2251, 2252. Made by men. ST said "wicked" to make rock pictures and all in their territory made by ancients.

SU pictographs made with ashes, no red pigment, deer only represented; for amusement only. SU petroglyphs by scratching with sharp-edged stone; no pecking or chopping.

WM petroglyphs by pecking, "just pastime." Gan (spirit) represented as standing; deer, bear, etc., in cave to S of Black r. Those on White r. near Ft. Apache made by ancients. Wa informant thought ancient Wa people made rock pictures in Grand Canyon. Zu petroglyphs of masked dancers in cave in Thunder mt. by early Zuñi. KP petroglyphs pecked. Pictures of clowns, people. By men in idle moments. "No meaning." Nothing to do with ceremonies or purification. "For fun only."

#### COUNTING

2254-2258. Counting on fingers. KP no rule as to finger to begin.

2259-2260. Counting with sticks or stones. WN no sticks or stones with special values, such as 10 or 100. SC big stick laid aside for 100. WM sticks of different sizes and values only in games. Li apart from games. SA special stick laid aside for each 10 counted.

#### MESSAGE MNEMONICS

Minuses for 2262-2264 mean no mnemonic of any sort.

2264. Tobacco in pipe or cane. Me in clay elbow pipe. NT, SC in cane tube. ST, Ci, WM in cross of cane.

ST 2 cane sticks crossed, eagle-down feather tied on, as invitation to dance (including war dance). Canes contained tobacco plugged in with deer hair. SC notokede, cane tube with tobacco, plugged with chewed mescal, delivered to chief of invited people. Messenger laid cane of chief's foot at base of toes, an act called bedegadachi'. Chief smoked it. Ci messenger carried cross of cane containing tobacco, plugged with shredded bark. Sent for war and other occasions, e.g., harvest feast. Laid on chief's right foot. Invitation "never" refused. WM cane cross, containing tobacco plugged with deer tail hair, laid on chief's foot. Then message delivered inviting to war dance and telling war plans. If not interested sent back cross. WS informant sent nothing. Me messenger carried elbow pipe. Invited chief assembled men. All who wished to go on warpath smoked it.

## ASTRONOMY, ETC.

2265. Named moon phases. WN 2: ta'heta, new moon; haniba, full moon. EN 5: abiiska, dark of moon, no moon; djahika<sup>n</sup>, new moon; atslibeke, half moon, "halfway" in sky at sundown; hanip<sup>n</sup>, full moon; chasinasla, waning moon, nearly gone. NT 3: taita, new moon; hatban, full moon; pikize, waning moon. ST 3: new moon; full moon, literally "round"; on wane, literally "moon coming up mid-night it rises." SC 4: yaiaschise, half moon; hanbas, full moon; sichinchaye, quarter moon, waning; tatsose, moon nearly gone. Ci 2: tax'hixa, new moon; hanbas, full moon. WS 3: shakuse, new moon; hanoban, full moon; chansheyehoye, half moon, waning. Hu 3: new, full, half waned. Me 4: shatsuse, new moon; bidjuye nena hayi, half waxed; hananopas, full moon; hintezi', dark of moon, no moon. Li 3: shatuse, new moon; ishli naskle, half waxed; hananoba', "roll out full." Ll 2: chakaske, new moon; chanonpa, full moon. Ol 2: kanaske, new moon; kanannipa, full moon. SU 3: matuhut kadun, new moon; matuhut pütukwak, full moon, literally "round moon"; matuhut yaai, dark of moon, literally "moon dead." Wa 5: muyakachip, new moon; changuinakachip, first quarter; nachapsit, full moon; changaishanapti, 7 nights beyond full moon; shilapti, dark of moon, "moon gone." SA 1 name for moon in all phases. SI 5: pocham, new moon; popindehe, half moon; potali, full moon; pokano, waning moon; poha, dark of moon, literally "no moon." KP 2: sa.iva, new moon; gotshilte, full moon.

2266-2273. Constellations and single stars.

2266. Orion's Belt. NT called ikizarstesa, mescal-butts-in-oven; also tibechu, mt. sheep. Rises ca. 4 A.M. in latter July.

(Red star, angry because nearly hit by hunter's arrow.)

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\* (Hunter shooting at mt. sheep.)

ST called mescal-butts-roasting. In SE of sky in A.M. in July. 6 stars drawn by informant:

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SC called ikezarikeze, mescal-butt; also mt. sheep at which hunter shot arrow; red star beyond angry because nearly hit. Me, Li called biyuka, deer-going; hunter shooting at it. SU called nagau, mt. sheep. Zu ipilasha, keeping-close-together, 3 stars, apparently Orion's Belt. NT call Orion's Sword Hilt hunter's arrow.

2266a. Women with children, Pleiades. Woman with children WM, SU only. Names: WN dilyché, told time of night by position; rising after Pleiades was ache'akosi, apparently constellation. EN disyehe, "taking away something"; not seen "in month of July." NT tasat'ata'a, coming close together. ST called together heaped; 7 stars rising in morning in July. SC tadaschaye, close together. Ci isaescha, 7 in bunch. WM isatesta, bunched together. WS soschade, bunched together; no story about Pleiades. Hu sonszsada, stars bunched. Me so<sup>n</sup>syade, stars bunched together. Li soschade, bunched together. Ol chusite, 7 clustered stars. SU seneu, woman and children according to myth. Wa tubandaka, all together. Zu kupawe, twinkling. SA ütache, small stars. SI kigiin, stars together.

2267. Saguaro-fruit gathering crook, Ursa Major. KP only, huspakuiba. Wa called Ursa Major "wagon," evidently from European designation of Charles's wain. Zu kwilelikyawe, 7 stars (also American name). SI chesbeti, ladle (dipper). WS sospi (stars).

2268. Little Dipper, Ursa Minor, called "pivoting" by all Athabascan groups: WN nahokas. EN nohokon; spoken of as a "man"; another constellation or star called "woman" said to revolve with it. NT nahokuse. SC nokuse. Ci nakuse. WM nankuse. WS nahokose. Hu nahakuse; also sonszpené (sonsz, star; pene?). Me so<sup>n</sup>sbi. Li sospene. Ll nakuzi. Ol nyahakuse.

2269. Not moving, Polaris. NT bisua, center around which something revolves. SC isote tosanaza, star not moving. WM isonse solai inada, star not move. WS sostunagada, star not moving. Hu soszhungada, star not walking. Me so<sup>n</sup>ssonada, star not walking. Li sostunagada, star not walking. SA chukoye. KP hūs, arrowhead.

Morning and evening stars. WN so'to, big star; both, also any big star. EN sonso, morning star; sonsoeaho, evening star. NT isotechu, evening star. ST called both big chief. SC isosetó, big star, morning star. Ci chissonsecho, big star, both. WM isonsecho, both; isonse, star. WS sochu'yigogas, big star traveling in day; both. Hu sonszhu, big star, both. Me so<sup>n</sup>ssu, big star, morning star; so<sup>n</sup>ssubiadi, female star, evening star. Li sostu, big star, both. Ll sonso, big star, morning star; sonso nieyi, big star even-

ing. Ol sonso, big star, morning star; sonso taiyi, big star evening. SU chüapotsi, morning star; tawashpotsi, evening star. Wa talchu, both. Zu moyachunslana, big star, real morning star; preceding it is star mokwanosena, "he is a liar," because false morning star; bilashiwani, "guard of the sun," evening star; however, Kroeber informs me name means "bow-priest." SA taistimu, morning star; chiapü, evening star. SI agonachikowabuwu, bright star, morning star; agoyasoyu, evening star. KP mahuhu, bright star, both.

2270-2272. Milky Way. WN, SU no name. EN desanshodi, carrying maize bread with ashes falling from it; myth says Coyote stole bread from fire. NT ipai, colored like buckskin; also called "ashes" of constellation ila (2273). SC ipai, white trail. Ci hipa', buckskin colored strip. WS yatogokai, white in sky; not ghost road, sky backbone, or bear's road. Hu yasákohe, heavens white. Me yachakuke<sup>e</sup>, white heaven; god Nayi'izone went there from earth. His partner (Nayeyane) got sick. Nayeyane killed by enemy (Comanche) who ground him on metate. Nayeyane came back to life, then called Kekaste (ground on metate) at his wish. For many years he lived. Before dying he instructed people to cover his body well with stones and he would come back in 4 days. People could not see him on earth, but in sky saw "smoke" (Milky Way), sign he was living in sky. He said in time he would return to earth and start a new "generation." Li "old woman with donkey scattering salt." Ll tospayi. Ol chospai. Wa chtumuka. Zu yupiyachane, hanging across. SA wakanchawi. SI obachuku, sky backbone. KP tomuk.

2273. Constellation "hand" or fingers. NT, SC ila, hand; may be part of Scorpio. Large red star (probably Antares) below arc of 5; rise in early morning in winter.

Other constellations. ST called ear pendant 3 big stars in line, seen in February and March, right in Milky Way, almost overhead, but to south; big wind, constellation in spring to SE which looks like 6 stars of Scorpio. SC istoze shititize, 2 stars together twinkling, said to be copulating. Li istanene sekwisti, "old women playing 3-stave game"; circle of 4 stars in middle of Milky Way, 5th star in middle. Zu okhalisho, "crazy woman," star which "appears in various places." SI kwidii, line of stars, 3 in vertical row; November 1, rise about 2 A.M., followed by Pleiades. kowidisipu, middle of sling, diamond-shaped constellation of 4, in middle of sky about 8 P.M., Nov. 1. kentabi, maize milk drying up, constellation in form of 3/4-circle, in N ca. 10 P.M., Nov. 1. Name refers to drying green maize in open pot.

2274, 2275. Falling stars. EN falling star omen of bad weather or other ill event. SC falling star thrown away by one who made it. Me informant once saw ball lightning in Guadalupe mts., New Mexico. Me, Li falling stars are falling stars, nothing more. Wa falling star is star going to wedding. Zu boys said going to get mar-

ried where falling star struck. KP boys watched falling stars to become good marksmen.

2276-2286. Eclipses. WN squaw dance, during my stay at Leupp, Arizona, abruptly ended on account moon eclipse. EN eclipse ominous of death through enemy tribe; all awakened at moon eclipse; proper songs sung. NT shaman sang at sun eclipse; people prayed for sun, pollen in fingers of right hand held toward sun. First to see moon eclipse shouted and awakened everyone; shaman sang; people prayed for moon, holding pollen in fingers. ST eclipse believed death of orb, which revived through people singing Changing Woman's good luck song. Ci eclipse caused by orb "going into sky"; most people indifferent, few frightened. WM people feared moon eclipse; made fire of bear grass and sang for moon to come out; done for July, 1935, eclipse. WS, Hu sun eclipse, sanuzhe (Hu), merely sun going behind something; moon eclipse kenahei mizhe (Hu); no observances. Li eclipse meant nothing; no idea of death of orb. Wa informant plainly reticent, but admitted moon eclipse was death of orb. Zu only shouted and wailed at sun eclipse; others sang only; sun eclipse death of sun; sun priest burned dog manure and prayed. Pots in house might become monsters, so smashed at eclipse. Moon eclipse no cause for worry; Zu scolded moon. SI omen of famine, death, etc. Feathers, pollen, and maize meal thrown in air by chief. Prayed orb to get well and not to bring bad luck. Pollen in fingers praying at eclipse. KP eclipse death of orb, no observances; mentioned in old stories, so nothing to fear.

2287-2289. Rainbows. WN pointed only with thumb; index finger would get sore; rainbow not ominous. NT rainbow stopped rain. Ci prayed, "Be that way all my life. Let me see you every time it rains." WS rainbow, house of Istlenachleche; prayed for blessing. Me some prayed rainbow. Wa child pointing would get lump on wrist or knee. Zu did not pray because rainbow "stops rain"; pointer would be stupid; if 2d time got sore finger. SI not point lest finger or thumb crooked. KP no beliefs.

2290, 2291. Pointing at stars. Ol caused warts. Wa did not lest die prematurely. Wa, Zu not counted, as must count all or die.

2292-2294a. Thunder and lightning caused by cloud people, EN, WS, Hu, Me, Li: EN young children shooting promiscuously. Hu distant lightning by old man; striking tree by bad boy shooting arrow. Me lightning is fire. Li also by great bird, lightning when opens wings, thunder when closes. Zu dead cause thunder. KP rainman makes thunder. SC male thunder with lightning, female without. Wa children pulled hair when thundered, so grow long. Wa and KP lightning strikes with flint points, which "dug up where it strikes."

2295, 2296. Male and female rain. SC female best for crop. SI baby lifted up, exposed to first rain; lifted up at first thunder.

2297-2303. Sex of sun, moon, sky, earth. EN

sun man wears shining turquoise pectoral; earth, sky are wife, husband. Li moon, sun cousins. No beliefs about praying mantis. Wa sun youth, moon old man.

2304-2307. Earthquake. NT god who made earth kicks it to see if sound. SC by god who made earth. Zu earthquake presages flood.

2308-2316. New moon observances and beliefs.

2308. EN unconscious person who revives is like new moon. Children must not look at new moon, as not run fast.

New moon observances. NT boys ran E, girls W. Adults (also ST, SC) said: "I'm becoming like you, young again." ST, Ci children and adults ran toward new moon; Ci said: "Make me run fast; help me to live long." WM first to see new moon shouted. Children ran 100 yards toward new moon, praying to live long. Ci, WM, WS, Hu, Me, Li baby held up to new moon by parent, who prayed for long life for baby. Ll no prayer. Ol adults prayed for long life, health, etc., pollen in fingers and motioning toward moon. SU new moon thought to come to life again, but no application to human beings; at spring new moon all rubbed faces and bodies, stretched. Wa children ran around, wished joy and happiness at new moon in both bamuya months (note 2247). Children danced those months. SI all rubbed hair and prayed moon to give them long hair (down to waist) to look nice for dancing.

2317-2319. Prayer to sun at rising. EN also prayed to midday sun. NT: "My father, let me live long on earth and have good luck in all this life." Pollen between right thumb and index finger, hand elevated (also WM); not daily, but whenever felt like it. SC: "New sun, you see over the world. There shall be good luck everywhere. Human beings shall be stronger and better living." Right hand raised with pollen between thumb and middle finger. WM prayed for long life; informant habitually on porch of modern shack. Zu sun priest and others prayed, then scattered maize meal and turquoise toward sunrise; some also offered maize meal at noon or other times. SI daily, cast maize meal and maize pollen toward sunrise. Prayed for prosperity, amity, good weather. No turquoise thrown.

2320-2322. Prayer to earth. EN also sky. Ol especially if ill. Zu also scattered maize meal on ground as offering, telling earth to eat as best she could.

2323. Sign language. Me some once known from Plains tribes. Ol slight use with tribes of alien speech; not much because Plains tribes enemies, especially Comanche and Kiowa.

#### LIFE CRISES

##### Childbirth

2324, 2325. Pregnancy regulations. ST also threw ashes E before sunrise; prayed Changing Woman: "May my baby come easily, without hurting me." Ci, WS, Me, Li walked every morning early,

any direction. Zu urinated below roof drain so baby would come easily. Must not let sunrays strike back lest unborn baby injured. HP avoided going out door backward, lest baby born feet first; did not apply to husband.

2326-2336. Pregnancy taboos. WN not laugh at queer animals lest infant born crippled; not eat rabbit killed by eagle. EN avoided sight of blood in killing of wild animals, not domestic animals. Li ate internal organs except intestine; not ear lest earache. Ll avoided hard food. SU ate head parts of deer, but not lower leg. Wa husband must not kill anything in unusual way, such as strangling or smothering. Zu avoided touching bow and arrows, lest twins; avoided 2 kinds of meat at one meal; husband killed no coyote, lest baby crippled or stillborn. KP young girls must not eat double things lest twins when married; pregnant woman ate no rabbit with lump in neck or elsewhere. HP food stuck in pot might cause death in childbirth; neither pregnant woman nor husband ate anything rolled in tortilla lest difficult birth; woman ate no meat for month before childbirth; did not eat heartily lest she and fetus too fat. Woman or husband must not look at hare-lipped person lest baby same. Ditto snakes. Husband killed nothing for month before baby born. Seeing death movements of jack rabbit might cause baby to have same some time after birth. Shaman would diagnose cause and get husband to confess. Cured by singing rabbit songs.

2337, 2338. Abortion. ST miscarriage sometimes by heavy load carried: elbow against side. Abortion by leaning over timber or hard surface to kill fetus. Might be done by married woman pregnant to another man. Hu abortion for girl by woman who understood, by pressure. Me abortion by another woman. Pregnant one lay belly up on flat rock. Other woman pressed with thumb and fist.

2339-2348. Parturition. Outdoors if weather hot: ST, Ci, WS, Hu, Me, Li. WN girls, not boys, allowed at parturition. NT parturient sat on 2 stones, dry grass below to receive baby; no fixed number of attendants, usually 4 or 6; parturient's sister laid baby on antelope buckskin, tied umbilical cord. ST sat on stone about 4 in. high, grass below; held to rope from roof; pressure on abdomen by person behind. If difficult, parturient lay on side, someone stepped on side to aid delivery. Helped to stand to get rid of placenta. Parturient's mother, mother's sister, father's sister, and husband helped; sometimes husband went for additional help. Ci any women who wanted to assist did so; ditto men. Husband there. Near relatives helped, neighbors if relatives lacking. WM 2 or 3 helped, related or not. Husband got them to come. WS any woman helped. Hu sat on low stone, grass on ground; held cross bar attached to roof. Me any women relatives attended, no men. Li held to nothing; 2 experienced women helped; any female relatives who wished present, no men; herb decoction if birth difficult. Ll, Ol 3 or 4 female relatives or neighbors; no men. SU any women helped; husband present. Wa any female rela-

tives and friends; parturient stood, leaning over kneeling attendant; husband called only if difficult. Zu held hands on top of head; any relatives. SA, SI 3 or 4 women; no special relatives mandatory. SI man not allowed; held chair, perhaps successor of rope or stake. KP small round brush shelter built by women for parturient; fire therein; parturient held cord from roof; husband helped if no woman. 2 women, sometimes 3, usually parturient's mother and maternal grandmother.

2349-2351. Shaman assisted difficult births. WN palm-reader shaman told what was wrong. EN shaman always present. NT made cross on ground; woman sat over center. 4 lines of pollen from woman's shoulders down front, back, sides. Then shaman put right hand with pollen on top of woman's head and shook. Then woman shook, called someone to hold her, baby delivered. WS prayed, sang, also pressed. Hu prayed, sang, gave decoction to drink. Me gave parturient something to chew as well as drink; drunk from turtle shell. Wa called birth specialist—not shaman. Zu shaman from one of medicine societies. KP shaman tried to manipulate baby into proper position if trouble due to not coming head first. Shaman smoked.

2352-2363. Navel cord. WN cut with any kind of knife which thrown away; cord buried in sheep corral, so child good herder. EN fine yucca fiber on umbilicus after cord cut; girl's buried in sheep corral or under loom; boy's in sheep corral, in farm, or in horse track; if cord lost, child imbecile. NT quartz flake to cut cord; Perezia wrighti root fluff on umbilicus. ST chert knife; fibers from Navaho blanket or fluff from Perezia wrighti root on umbilicus, bound in place by belly band; cord off in 4 days, tied with string to cradle hood; cradle with cord tied in tree when discarded. SC Perezia wrighti fluff on umbilicus only when inflamed. Hu cord in buckskin pouch attached to cradle, or in bush in sunrise direction. Me any woman cut cord and washed baby using "baby grass" (thunder weed); cord tied with buckskin or, if none, yucca fiber; placed in young tree. Li only impaled cord on cactus spine. SU cord in buckskin pouch on cradle; after 2 or 3 years put in cave or rock hole. Wa sagebrush ashes on umbilicus; little stick tied in navel cord; deposited in house ceiling, boy's tied to small arrow. Zu cord tied with wool fibers and plastered with dough; boy's buried in maize field, girl's at metates in house. SA iron knife; cotton on umbilicus; boy's buried in maize field, girl's in house. SI cut with fingernails; buried in ant hill so ants would not bite child; or boy's buried in maize field so good farmer, girl's buried near metates so good miller. KP cord buried anywhere.

2364-2367. Disposal of placenta. WN buried in ash pile. EN in badger hole, so child strong like badger. NT parturient stood to get rid of

placenta, then lay on side and someone pressed gently with foot to further expel it; placenta in fawnskin, put in bush or tree about 3 mi. from camp. ST wrapped in grass, put in branches of tree ca. mile away. WM wrapped in grass, put in tree to E. SI buried in maize field for good crop. KP wrapped in cotton cloth, put in cholla cactus.

2368. Hot childbirth drinks besides deer soup. Warm water, EN, NT, SC, Ci, SU, SI. Decoction of juniper leaves, EN, Wa, Zu, SA, SI; EN, Zu to aid passing placenta. Maize gruel, EN, ST, Ci, WM, WS, Ol. Mescal juice, ST, Ci, WS. Unidentified plant decoctions, WN, EN (boiled roots to aid passing placenta). NT only hot drink limited to first childbirth. Me unheated juice of low cactus (Mammillaria?), also chewed pulp of body of this cactus, which bears edible fruit.

2369. Deer soup. To new mother whose milk withheld, NT, WM, Wa (another woman suckles child meanwhile), SI (also antelope soup). Ol hot maize gruel to bring milk. Li much deer soup to drink for 2 days before suckling; "never case of no milk."

2370-2373. Twins. WN if more than twins bad omen; triplets after return from Fort Sumner, people did not like but allowed to live. EN if one twin died, other died; no special heaven. ST not liked because too much work for mother. Ci one killed, mother made choice. Me one killed on account of roving life of Me. Li, SU "never heard of twins." Wa pregnant woman suspecting twins wore cord to make into one fetus. HP if twin wished something for twin sibling it would come to pass.

2374. "Steaming," etc., of breasts to start milk flow. NT warmed green leaves applied. WS hot medicine on breasts, no actual steaming. Me warmed sage leaves on breasts. SU bathed and salt rubbed on before suckling; if no milk or breasts sore, shaman touched with his head. KP massaged to help milk flow.

2375-2377. Bathing of mother and infant. WN water only, no yucca suds; baby's face painted red after some days. EN baby's first excreta put on its face to prevent wrinkles. ST sister, mother, or maternal grandmother of new mother first to bathe baby. SC baby washed by woman who aided parturition. WM no particular relative to first wash baby. WS old woman, usually grandmother, first washed baby. Hu no rule as to who first washed baby. Wa if paternal grandmother of baby not present, paternal aunt washed baby in water from paternal grandmother's home. SA baby's paternal aunt washed it. KP newborn baby wiped with cloth, not washed.

2378, 2379. Disposal of stillborn. EN in branches of tree with head to N; male in juniper, female in piñon. Wa in small children's burial place, not with adults. SA, SI under floor in corner of back room. KP covered with stones.

Other infancy practices.—Lying-in period. WN, NT, Ll 2 days; EN, Ol any number required; ST 6 or 7; SC, WM 5; Ci 4; Hu 2 or 3; Me 10; SU 30; Wa, SA, KP 8; Zu 8-10; SI 4; WS, Li uncertain. WM, Li mother walked in hut; Li worked a little.

2380. "Baking" of new mother and infant in brush-lined pit, Hu, SU. Days "baked": NT 1, Hu 3, SU 5, Zu 10. EN on warmed ground till bleeding ceased. NT mother and baby "steamed" in pit lined with hot stones and green brush for 1 hour; covered with blanket. NT, SC, Hu buckskin belt worn by new mother; or wrapped rope, Hu. Hu mother in heated pit only in cold weather; in warm weather on ordinary bed of brush, grass, etc. Me new mother kept warm with bedding for 2 days; walked once in a while. SU juniper-bark covering for lying-in pit. Zu father's mother of baby prepared warm earth or sand for new mother and baby. Hot stones to heat. Blanket over earth or sand. Wa, SA 4 days in bed, 4 days in house; after that regular duties. SI lay in 4 days, then washed all over with warm water; indoors 15 days longer.

2381. Warmed stone on new mother's abdomen. Wa until felt better. SA 4 days. SI juniper foliage burned in pot to warm parturient. KP greasewood branches warmed on coals pressed against new mother's body to aid recovery.

2382-2385. Suckling begun. Zu suckled as soon as cried. SI first suckled by mother on 4th day, meanwhile milk from another woman.

2386. Drinks for infant before mother suckled. Juice from under juniper bark, WN, EN only; boiled juniper leaf, SA; water, SC, Hu, Ol, SU, Wa; milk from another woman, Wa, SI. EN juniper juice to make baby vomit. Ci cooked mescal juice in case milk delayed.

2387. Maize pollen on baby's tongue. EN for 4 days. KP baby taking meal from metate on ground sign of long life.

2388. Infant held to 4 cardinal directions, Me, Li; to 6 directions, Zu, SA, SI. Me any woman held up infant; cradle maker prayed for long life and success for infant: great hunter or warrior, industrious woman, etc. Wa after 4 days baby held up to sun at sunrise. Zu father's mother held up baby to 4 cardinal directions at birth and prayed for long life. SA baby not actually held up, but 6 cardinal deities addressed.

2389-2391. Infanticide. Hu if mother did not want, or if none to rear after death of mother. Me strangled with yucca leaf, buried.

2392-2399. Taboos for mother. Number of days: 2 (WM), 3-6 (EN), 4 (NT, SC, Ci, Wa), 6 or 7 (ST), 7 (Ll), 8 (KP), 10 (SI), 15 (Zu), 30 (SU), 120 (SA). SU father also inactive 30 days. WN father must not kill or see anything caught by predatory animal for some days before and after birth. EN husband with new mother, tended fire, etc. She ate nothing sweet, cold, or excessively hot. ST mother did not bathe for 10 days, lest internal cold, which "made blood bad"; no salt, meat, fat. Husband ate anything, also hunted. Lying-in mother ate maize gruel and cooked mescal juice. WN mother ate fat after 2 days. Ll

mother ate no meat because it gave aching feeling. SU meat and fat taboo to mother and father for month; father remained in childbirth hut 5 days, did not hunt for month; both used scratching stick for month. Wa baby no cold water to drink till 8 days old. Zu mother drank through gourd tube; only hot water for half month. SA mother drank warm water for 4 months. KP 4 days in bed, after which might wash herself. Might sit up then, washed again at end of next 4 days. Then returned home. No purifying. Refrained from drinking cold water 4 days only.

### Naming

2401. Naming 4-20 days after birth. Ll 7, Ol 4, Wa 20, SA 4, SI 4.

2409. Male children only received war names, NT, SC. WN might name at birth or much later. EN warrior named baby, both sexes getting war names, but differing for sex. See note 2518. NT informant Nacheye, breeze blowing. ST child not named for clan or clan animal; no 2 living persons with same name. To name child after great dead man, must be dead about 15 years, must be of child's clan. Father said to one of elders or head man of clan: "I'm going to speak about your dead relative. I want to name my boy for this dead chief. I shall name him (chief)." If chief consented father proceeded. SC small children named for fruit trees, plants, winds, rocks, birds, mountains, water. Usually changed at 15 to 20 years. Boy's name changed to Haske (brave man) name. Girl's not always changed. Examples: Ischi, quail, boy's name; Kuskan, Spanish bayonet yucca fruit, baby boy's name; Nachekei, white people passing through gate, grown girl's name. Men's names: Haskedesla, brave fighting man. Haskepanenchel, brave fighting men crashing together, name of Apache Kid, notorious outlaw. Ci named by parent of grandparent. If for relative "dead about 40 years," it was in mother's clan. Informant's name Naitdja, picking up all sorts of things, of nickname type. WM not named for weather because of fear of lightning and clouds. Sample names: Round Foot, Baldy; woman who died in 1935 named for goddess Istenatlehe. Sometimes names changed at puberty. WS boys and girls names referred to war; informant's name Toklanni, much water, referred to white settlement where much whiskey taken by Apache. Hu names usually referred to war events; relative angry if baby named for him or her. Me named at crawling stage by cradle maker (man or woman); for personal peculiarities, natural phenomena, animals, etc. E.g.: Water Boy, Star Child. Informant Piganzi's name is non-Apache; received when joined U.S. Army. His Apache warpath name Sistanihe, "wounded enemy lifting his head," bestowed on him on 7th war party by comrade who gave him blanket and said: "From now on your name will be Sistanihe." Previously called Little Boy. Li immediately after birth or several years later; boy's name changed only when warrior. Ll permanent name ca.

week after birth; "meaningless." Ol 3 or 4 days after birth. SU mother named baby when commenced to walk; informant named Yagapue, "crying all the time"; meanings of informant's wife's name Ita and of interpreter's Chodos not known. Wa when 20 days old; see 2460. Zu named for long-lived grandparent, when child began to talk. SA by father's sister; boys' names differed from girls'; children sometimes named after animals; informant's name Owaskiwa, meaning unknown. SI baby named for animal or plant, on 4th day before dawn; washed with yucca lather, then covered with blankets. Named by navel-cord cutter, who went outdoors, threw maize meal and pollen toward sunrise and prayed; then to N, W, S, E, up, down. All directional gods informed of baby's advent. Indoors, father and mother given medicine water to drink and to spray on baby from mouths. Woman offered medicine water to parents, saying, "You drink medicine water for -----," naming child. Informant's name Tetse, goldfinch; wife Kweka, oak leaf. Clanship did not determine name of child. KP baby when crawling, by maternal grandfather who named it in song; names referred to activities, directions, clouds, trees, plants, flowers, but not animals. Names often referred to activities of men or women.

2413. Teknonymy. EN after first child mother referred to as so-and-so's mother. SA to show respect called person father or mother of so-and-so.

#### Education; Puberty; Menstruation

Children's education.—WS, Li grandparents instructed children most because "knew more than parents." Hu parents principal instructors; if father away or dead, paternal grandfather principal instructor of boy; if mother dead, paternal grandmother, of girl. Ll besides father, older men, related or not, instructed boy. Wa sometimes boy instructed chiefly by mother's brother. Zu grandparents and parents; if child help up fingers in sunlight shining into room, told to stop as would be lazy.

2420. Children bathed in snow or ice to harden. SC to make healthy. WS in ice water also. Me began snow bathing at ca. 10 years old. Li very little snow in Li habitat, so bathed in cold water or with icicles from trees.

2421. Bugaboos. ST crying child admonished to see big owl (moon): "Owl is going to get you if you do not stop crying." Ci white man as bugaboo nowadays. WS owl, wolf, coyote. Hu owl and wild mammals. Me owl not bugaboo because "wicked" bird, but some large-mouthed bird or mammal. Li wild animals such as coyote, whippoorwill: "There comes whippoorwill with a big basket to put you in." Wa "owl will come and tear your belly open if you do not stop crying." SA also hawk. SI owl one of several bugaboos.

2422. Wound cross is "bugaboo owl." EN of sumac. WS some object, e.g., old piece of buckskin, hung in hut as "bugaboo owl."

2423, 2424. Disposal of first deciduous tooth. Thrown to E at sunrise, except: Ol no special direction. Zu, at sunset. SA any time. EN child told to throw toward sunrise with eyes closed. NT by either parent, no prayer. Ci child threw toward sunrise. WS relative who threw tooth toward sunrise prayed for new tooth to masticate tough food. Hu put in base of gramma-grass stem and slung toward sunrise by child or parent: "I hope new tooth will grow quickly, so as to chew tough meat." SU put in center of grass clump. Wa threw toward sunrise: "Go and get some salt for me." Zu at sunset child threw toward E saying: "Father's mother, here is the tooth; give me a new tooth." SI prayed sun for new tooth. KP child threw W at any time of day, requested bear to supply new one.

#### Boys' puberty observances.—

2425. Play with sisters taboo. ST before boy reached puberty (voice change), i.e., when "big boy." WS if alone with sister; play permitted if in group. Li also female cousins. Ol "liable to fall in fire if play with sister." KP boy usually with father, did not play much with sister.

2426, 2427. Trained in tribal legends. WN boys instructed by father and grandfather. EN boys told myths from early childhood on. Hu boys taught myths and songs at night by grandparent. Me 4 nights at time in training in tribal legends; both sexes. SU boys went to certain old men to hear myths; told on winter nights only. Zu began learning myths when 21 or 22 years old. KP boys trained in tribal legends nightly; also modes of life, behavior, etc.

2428. New name. Notes 2400-2413. ST new name for boy at age 21. Ditto girls. Discarded earlier name, though sometimes called by it. New name of serious type. Word meaning "fierce" prefixed to name used for males. At name change put charcoal in mouth, took out, cast to E, addressed Sun: "May I have a long life." Ci boy's name changed at puberty, if earlier name not suitable for young man. Wa new name for youth only at initiation.

2429. Running. Hu ran uphill as training rather than initiation. SU boy ran any direction at puberty any time of day; boy's father urged him to run. SA boy ran any direction. SI father made adolescent boy run every morning. Father or other old man (if several boys) accompanied on first morning. KP boys and girls aroused early to run. No supervisor. No special direction.

2430. Whipped with twig by father. NT gently on 4 mornings, to make good hunter, warrior, runner. Ci switched by father one morning only, though might be switched at other times if disobedient, but only lightly.

2431. Ran E at sunrise. Boy on 4 days: NT, SC, Ci. ST at puberty, father told boy to run to E clockwise and back. Father sang while boy ran. Done 4 times, different song each time, all from eclipse series. Before dawn father regularly awakened him, told him to get up, urged him to

practice running, so when challenged to race could acquit himself properly. Ci boy ran E at sunrise on more than 4 mornings sometimes. Me boy ran at sunrise, to E, uphill, or any direction. Bathed in cold water. Boys and girls from 10 up ran together but bathed in separate places. Old man with rawhide whip conducted them. If mother did not want child to go, she sent child outside hut, struck once with whip and exempt for morning. Li old man with switch or rawhide whip had boys and girls run in morning. Also bathed in early morning. Ol boys ran, any direction, man in charge without whip. Boy not sent to woods for vision. Wa father admonished son: "Never be lying down at sunrise. Run, bathe, etc., in early morning." Zu boy bathed in river, ran in any direction. No set number of days. Boy's father got him up early to do this.

Girls' puberty observances.—

2432a. Special term for 1st menses. EN kenasta, 1st menses; bigagiswu', subsequent menses. WM chelyigut 1st and subsequent. WS, Hu "so-and-so went out," euphemism for 1st menses; kutikle, menses, Hu. Me chedjente, menses. SU 1st nagaduwomi; subsequent, sonagaduwomi. SA maachi, menses; 1st called by same term with modifier. KP 1st menses, duwa; subsequent, chulka.

2433. Girl in dwelling. ST only girl in heated pit in dwelling. Ll no girl's ceremony; lectured by mother or grandmother on caring for self, how to live, etc. During 4 days girl worked or not as she liked. Zu, SI no 1st-menses observances; girl might not even tell her mother. SA juniper-leaf decoction drunk.

2434. Girl in special structure. SU at 1st menses little corral made; or in winter little bark hut. Allowed no meat. Mother fed her on "barrel-cactus" pulp, grass seed, hot water.

2436. Girl on blanket outdoors. SC if weather clement.

2438. Girl fasted. EN from salt and sweets. NT might eat salt; all food eaten cool lest hair come out. SC girl did as she pleased about food, sleeping, etc. KP fasted from meat, fat, salt for month; did not have to drink warm water.

2440-2444. Girl worked. EN customary work, did not carry to other huts. Ground maize, other girls helping. After 3 days her family made earth oven for cooking maize cake. Girl made bed of maize foliage in 4 cardinal directions, then poured maize batter on it. Other women did remainder of work. NT, ST carried wood and water for every family in camp; rested rest of day. Anyone might talk with her. Ci wood and water for 4 days to all huts in camp. WM admonished daily by parents to be industrious. WS carried wood and water only to parents' hut. Hu on 1st day girl quiet, no work; on subsequent days helped mother as usual; no carrying to other huts. Me worked or not as wished. Li no special work; went about as usual and played with other girls. Wa ground maize for father's relatives for

1st 3 days, not on 4th. Stayed in father's sister's house for the 4 days, did not go outdoors. Ground all day except meal times. Wore white robe with red and black border in going to aunt's house. Discarded beads, etc., and worked in plain clothes. Hair washed by aunt on 4th day, when got new name; also old name continued to be used (2460). KP usual work, no special work to make industrious. No crescentic stone used, no lecture, except mother admonished and instructed.

2447. Scratching stick. WS go bald if scratched with fingers.

2451-2454. Girl painted. Except for SU, face painting was for public ceremony. SU girl painted face and hair red on leaving menstrual hut. Left on till following morning. Wore special buckskin belt (2458), which gave to next 1st-menstruant. No singing or dancing.

2456. Girl pressed and moulded. NT girl pressed with feet and hands of strong woman, so strong. Notes 2461-2485.

2458. Girl wore special belt. Notes 2461-2485. WS buckskin belt. Li ordinary belt.

2461-2485. Public ceremonies. WN relatives, friends came. Girl up at 3 A.M., ran, accompanied by girls and boys. Returned racing. Done 1st night only. Women sat one side of hut, men other. Men sang. Girl opposite door, no special attire. Special maize cake baked in earth oven for occasion (no stones, just hot earth). Girl on belly on round stone during day, except when grinding maize. No presents to guest.

EN neighbors invited. Girl sat in hut. Shaman sang 20 songs. Men called on to sing by relative of girl. 4th morning, oven-baked maize cake cut, presented to singers. Yucca hair wash for girl. Then ran before sunrise, adults with her; called sideskla. Bad luck to run ahead of girl. Returning, girl leaped from hut entrance to her place in rear. Truthful woman pressed girl lying on blanket, sometimes mother or aunt, outdoors if warm day; 4th night her face painted red, no special design; prevented early wrinkles. Girl in best with special belt, beads, etc. Shaman sprinkled her with pollen, prayed over her.

ST at sunrise shaman sang 4 eclipse songs as she lay on pile of 4 deer hides, face down, head to E. Healthy, lucky old woman pressed her (nose, cheeks, arms, legs, body, etc.) meanwhile. Girl ran E and back, followed by children, sometimes adults too. Girl threw deerskins in order E,S,W,N. That night pit with hot coals, wet grass, damp earth, and 4 blankets for her to lie on again. 2 more over her. Old woman molded her again; no singing. Next 3 days girl ground maize, carried water and wood on advice of mother, so not lazy later. Scratching stick of cat's claw wood, drinking tube of 6-in. cane for 4 days tied on string around neck; not drink much water. After 4 days, ceased use of these, washed, dressed in good clothes (old clothes hitherto), painted face red. Wore Zu or Hopi cotton sash around waist, red, black, white stripes.

SC family of girl invited and fed guests in summer, not winter. 12 songs by man, asking for health, etc., for girl. At 1st of last 4 songs girl ran toward sunrise, 2d to S, 3d to W, 4th to N. 3-ft. cane planted at each cardinal point in turn for girl to run around. Women and children ran with her. Then she carried wood from 4 cardinal directions, ground maize, acorns, wheat, etc. Other girls helped her grind and distribute food to huts. Through by 10 A. M.

Ci girl's face painted red by mother (sometimes girl) for 4 days; zigzag horizontal negative design with 4 deer lower incisors. Ran at sunrise and other times for exercise; not mandatory. Pollen on her head by all present on 1st day. People prayed to girl for long life for selves and children, just as prayed goddess Istlenachlehe, whom girl represented.

WM ceremony often months after 1st menses. Thus 2 girls had joint ceremony in September, 1935; 1st menses 10 months earlier. People danced clockwise in circle till dawn.

WS 4-day ceremony began when girl started flowing. On 5th day Haliotis pendant in her hair (2455). Slept in family hut, danced in specially erected hut, while shaman shook deer-hoof rattle and sang. Conical hut for ceremony had 12 big poles, brush over lower part, rawhide and tanned skins upper part. Pollen on 1st day in line across face. White on face only on last day. Brush fence led out from door of hut. Male singers sat at end of fence, accompanied shaman. Girl danced on rawhide; up all 4th night. For every song, 1 stick thrust in ground by singers. 80-100 different songs on 4th night. Last morning girl ran E, after singer printed sun picture with pollen on her forehead, by making ring and rays on his hand, then imprinting (Hu also).

Hu ceremony started 1st day of bleeding (nowadays ceremony on 4th of July). Girl's face near mouth streaked with white on 5th morning. Girl ran toward sunrise and back on 1st and 5th mornings. People came for blessing from ceremony. Shaman and assistant marked males with white and red clay on left, females on right cheek. Shaman blessed wild food to be eaten. Girl wore 2 eagle feathers in hair and fancy buckskin belt. She danced with masked spirit (gan) impersonators outside 1st, then alone in special hut, pulled down on 5th morning. Girl up all 4th night.

Me ceremony 2 or 3 days after bleeding started, or 4 days of menses might be succeeded by 4 days of ceremony. Sometimes only 1-day feast, ceremony at 2d menses. Father announced time to move to certain open space, erect big hut, and hold 4-day feast. Singer directed erection of conical brush hut. At pole cutting (women went too) he sang 1 song for each of 4 main poles cut. (Regular Me hut had 3 poles.) He led singers throughout ceremony. Mescal stalks tied together for poles. Hut ca. 20 ft. across. Brush fences ran out from doorway ca. 25-30 ft. People sometimes danced (modern) in front of entrance passageway. Only girl danced in early times, indoors and out.

Singer shaman walked backward into hut, shaking deer-hoof rattle, holding bunch of feathers in one hand. Girl held other end of feathers and thus led into special hut.

1st morning girl ran 4 times toward sunrise passing 4 times around basket of pollen which woman attendant set on ground. Girl ran shuttle fashion to E and back to W, making call with fingers on lips. Before this all who wished put pollen on her cheeks and head. She did same to them.

Women did not sing, but made noise representing thunder with fingers over mouth, also by woman who pressed girl. This woman dressed girl for ceremony. She knew all details, was lucky and long lived. She was paid horse, buckskin, or buffalo robe, and 2 other things by girl's parents. Singer similarly paid. Girl led horse to him as pay on 5th day. He then gave her 1 yucca fruit sprinkled with pollen to eat, mentioning every kind of fruit as he did, and praying that she live long on these fruits, etc. He made sun picture on palm of his hand and imprinted on top of her head (also Li), praying she live to be gray haired.

Girl wore special costume and fringed belt of buckskin. In her hair 2 black eagle tail feathers. On 5th morning her face painted white, red, blue, yellow; nothing to do with cardinal points. Ceremony ancient, antedating masked deity cult. Goddess Istlanatlehe and son Nayiizone, originators.

Li family not prepared for ceremony at 1st menses, held at second. Girl danced behind fire in parents' tipi, while shaman shook deer-hoof rattle. No special hut. Girl ran toward sunrise 1st morning, while woman who dressed her made call with hand over mouth; also pressed girl first morning as she lay on robe outdoors; paid with horse or buffalo robe for services. On last morning shaman-singer painted girl's face red and white; stripes vertical on face, 2 red with white between. People put pollen on girl's head and on face under eyes, prayed for long happy life for themselves and girl. She put pollen on them. Girl wore black or black-tipped eagle feather, buckskin belt, fancy buckskin costume. Girl "like" goddess Istlenachlehe.

Ll informant denied ceremony with girl representing Esdzanadlehi and boy Nayenezgani (Goddard, p. 177). However, SI informant who had seen, verified Goddard's statement.

Ol old man prayed on 1st and 4th days for long life for girl; did not sing. No dancing. Girl's parents feasted any visitors, though not public ceremony. Girl wore regular belt and dress, no gala attire. Informant denied Goddard's statement (p. 177) about boy in menses observances.

KP men and women mixed in 2 lines of dancers. No fire. Usually danced till dawn, any night of girl's first period. Purpose purification of girl. Papago in Sonora used gourd rattle, but not KP. Special hut denied by KP, but see Underhill, 31.

2483, 2484. Girl ran at sunrise. Notes 2461-2485. NT girl ran alone 4 times on 1st day, 1/8-mi. to W and back 4 times. Must keep mouth shut, not pant.

2486-2497. Regular-menstruation taboos.—EN rode horse if painted its legs red; for conception, intercourse right after menses most effective; no intercourse for 3 months after childbirth. NT woman in period fetched water; NT only husband also bathed at end of wife's period. WS menstruant on horse or mule would ruin animal. Hu menstruant not dress another woman's hair, as harmful to that woman. Ol did not ride horse because harmful to her, not horse; all taboos for her welfare. Zu, SI women never horseback. SI not make pottery because clay "too cold."

#### Berdaches

2498-2500. WN female berdaches hunted and warred. EN shaman in 1935 donned women's clothes, wove. ST lazy men and women who wanted to cohabit with own sex. Ci dressing of boy like girl in dance, not continued. SU male berdaches made baskets and pots, did not cohabit with men; one female berdache dressed like man, made baskets and pots, never married. Zu male berdaches dressed like women, women's work, sometimes "married" man; parents might bring up boy as girl if no girl in family. SA male berdaches did women's work. KP male berdaches did women's work, did not cohabit with men; female berdache cowboy at Sells in 1935; female berdaches hunted, warred, never married.

#### Marriage

2502-2506. Polygyny. NT 2 wives limit. ST good hunter, wealthy man, 2 or 3 wives, well treated. Poor man one, not treated so well. Wife beater would not get 2d. Cowives usually sisters, also wife's sister's daughter. If 3 wives, man slept between two, 3d slept at their feet. If 1st wife many children, special hut for her 150 ft. away. SC chief more wives because strong fighting man, many horses and cattle. Ci 2 or 3 wives. WM 1st wife's permission to take 2d. WS sometimes 4 or 5 wives. Rich men polygynists; they brave fighters and much property. Hu 2 or 3 wives, wealthy man or noted warrior. Me polygyny modern, not old. Li some Comanche married, resided with Li. SU polygyny after Mormon example; monogamy earlier. KP cowives usually sisters.

2507. Child betrothal, before puberty. Child to child, WN, EN, NT, ST, Ci (sometimes), WS (sometimes), Hu (sometimes); others denied. To adult man: EN, ST; sometimes (WN, NT, WM, Hu); others denied. EN as early as 7 years; parents exchanged presents. ST sometimes girl married if no parents. If 12-year-old boy, diligent, obedient, promising, couple with daughter might arrange betrothal. Ci child to child only in fun; when grown probably married others.

2508, 2509. Parental approval necessary for marriage. SC parents urged girl to marry industrious young man. Hu girl growing up and not liking grown man selected for her, declined to marry. If he had given much to parents, they might force her. Me boy's parents might select wife for him; presents to her parents: horse, buffalo robe, etc. No immediate reciprocal gift, but later small gifts. SA after marriage boy's father gave land, horses, etc., girl same from her parents. KP parents of girl took 1st steps (2512). Young people exercised some influence. Girl who left husband might be forced by her parents to return.

2510. Gifts to bride's parents first. WN by bridegroom's father or brothers: silver objects, horses, cattle, beads, buckskin. No sheep, but nowadays money. After marriage, groom, dressed in best, took 3 or 4 horses to parents-in-law. EN 12 horses or 1 good turquoise; formerly ax, arrows, bows, buckskin, mt.-lion hide. Bridegroom must possess 2 stone axes to get married, one to use himself, one to pay for girl. At presentation, girl poured water on hands of guests to wash, dipped from pitched water basket with gourd. NT buckskins, arrows, moccasins, hides (blankets), seed for pinole, dress for girl. ST bridegroom's family made buckskin dress for girl; also buckskins, baskets, acorns, etc. SC horse, saddle, buckskin, 2 or 3 head of cattle, moccasins, buckskin dress, etc. Ci young man hunted with father; several deer taken to girl's parents. If accepted, bargain sealed. Buckskins, etc., followed. WM young man's father took deer, seeds, mescal, buckskin to girl's mother. WS deer, horse, gun, buckskin, Navaho blanket, etc. Hu horse, buckskins, gun. Li buffalo robe, buckskin, horse. Ol young man deer to girl's parents after consent.

2511. Reciprocal gifts to bridegroom's parents. EN basket of maize mush, the basket for them to keep, lest bad luck for newlyweds. NT pitched water baskets, cooking baskets for seeds, arrows, seeds, buckskins. ST girl's family gave food. Presents exchanged 3 or 4 times in month, then ceased. SC nothing, since "hard time raising girl," and girl to work anyhow. Ci food, baskets; no exact balancing of gifts. WM same sort and amount received. WS like gifts. "2 families as one," made frequent gifts. Hu anything. Li rifle, bows, arrows, etc., to bridegroom's parents, or to him. Bride presents to parents-in-law throughout life.

Gifts to bridegroom's parents equal in value: NT, Ci (sometimes), WM, Li (sometimes), KP. Of less value: ST, Ci (sometimes), WS, Hu, Li (sometimes).

2512. Gifts to bridegroom's parents first. KP grain, provisions, etc. Reciprocated similar gifts, including deermeat (not whole deer).

2514. Bridegroom and male relatives made trousseau. Wa bride at bridegroom's house till finished. SA if could not make, must buy: woolen manta, moccasins, leggings. SI dress, beads, blankets, etc.

2517. SU groom's mother made buckskin dress, moccasins, etc., for bride.

2518-2526. Symbolic acts at marriage. 8 groups performed various symbolic acts at marriage, yet general idea seems to underlie all. "Bride scratches groom" by NT; "sometimes" before marriage (doubtful) by Ci; others denied.

WN couple fed each other mush with fingers from 4 sides of bowl; poured water in each other's hands for washing. EN new names; maize-pollen cross by girl's father, grandfather, or uncle in front of seated couple, circle enclosing cross drawn either direction. Li person with power for lucky marriage prayed; bridegroom paid bow and arrows or buffalo robe; or if woman, something woman could use. Marriage feast followed. SU ate grass seed or berries from same dish at groom's parents' home. Wa clothes smoked with juniper foliage; groom's mother washed girl's hair at her house, girl's mother groom's hair at her house. Zu groom presented manta to bride. SA bride washed groom's hair; bride's washed by her mother, both in same bowl of yucca suds. Robes not tied together lest twins.

2527-2529. Bride carried presents to mother-in-law. SC food as long as in same camp. SU cooked grass seed. Wa hunter's wife always took front or hind quarter of deer. Zu bride ground and took maize meal.

2530, 2531. Sororate (post-mortem). Among most Athabascans post-mortem sororate largely compulsive for man if parents-in-law ordained. Length of widowhood or widowerhood period in years. Except Li 6 months, year or more. SU 5 to 6. 1-3 ST; 2-3 SC, WM; 1 NT, WS, Ll, SI; 2 Ci, SA; 1-2 Hu, EN, Wa, Zu, KP; 1 up Ol. Shorter periods usual minima before remarriage approved. Sometimes briefer intervals: Ci, WM 1 year; Hu 3-6 months; Ll 2 months; SI 2 or 3 months. Instances beyond.

EN widower whom parents-in-law liked told to come in 6 months and marry dead woman's sister. ST, Li parents of dead woman selected wife if widower good man; ST watched him closely during widowhood. Ci unmarried sister of dead woman took brother-in-law by hand and pulled him away if with another woman. "He belongs to me." If divorce preceded death, no sororate. WM widower's parents-in-law consulted over new bride, mother-in-law's relative, whom she asked to marry widower. WS for breach of post-mortem sororate widower might have to pay horse. Hu widowed person might remarry in few months with permission of dead spouse's relatives. If no close relatives, widowed person did as pleased. Me sororate if man not "mean" and wife beater: gave him either daughter or niece before he espoused unrelated woman. He must accept. Zu penalty for premature remarriage was swelling up and dying. SI post-mortem sororate if man liked his wife's sister.

2532-2534. Levirate. Levirate compulsive among some Apache groups, woman evading punished by nose cut off as for adultery.

EN levirate customary, but widow married whom she wished. NT if no brother, dead man's mother's brother married widow. ST widow waited 1-3 years for levirate, man's family watching her; married brother or sister's son of deceased. Ci, WM breach of levirate resulted in fight with man who took widow and cutting off of widow's nose by dead husband's kin. WM levirate in 1 year. WS sometimes death to woman for levirate breach. Hu compulsory. Woman who evaded had nose cut off, or she and new husband paid horses and other property. Note 2530. Me no rule as to length widowhood. Remarriage soon if dead husband's relatives willing; no levirate if brothers already married. SI levirate optional.

2535. Marriage to mother and daughter. Mother first, EN, WM, Hu, KP; at same time, WN, KP. EN mother first account mother-in-law taboo.

2536, 2537. Cousin marriage. Positive answers without genealogies dubious. NT cousin marriage, but not close. ST cousin marriage, but not related closer than 4 or 5 generations back. SI cacique informant said parallel and cross-cousin marriage!

2539. Man marries mother's brother's widow. Li if widow desirable to keep in family and he single.

2540-2547. Postnuptial and final residence of married couple. EN marriage and postnuptial residence at bride's home. SC with bride's family, then bridegroom's; after 2 or 3 children, lived wherever liked. Ci matrilocal residence brought man under control of wife's clan chief, nearest Ci approach to village chief. WM with bride's parents for 2 or 3 years, then with man's. After that back and forth or wherever wished. Final residence depended on which possessed good farm, horses, etc. WS no rule. Hu matrilocal proper, though not always. Me if parents of newlyweds in same settlement, patrilocal residence. If parents far apart, either patrilocal or matrilocal. SA as couple wished. SI matrilocal first. Later, with aid of relatives, built new room, near his or her parents or away from both.

2548-2557. Parents-in-law taboos. Ci woman calling son-in-law from distance for food, shouted: "Food is ready," then left house. WM woman meeting son-in-law on trail made circuit to avoid him. WS father-in-law and son-in-law avoidance, no conversation. Ll mother-in-law by 3d person informed son-in-law food ready.

2559-2562. Sibling-in-law joking. WN obscene between brothers-in-law, decent between siblings-in-law of unlike sex. EN jokes, obscene or otherwise, with any sibling-in-law. ST relatives-in-law joked distant, not close; could joke distant cross-cousin's wife, or mother's brother's wife if mother's brother present. Ci, WS, Hu, Me, Li, Ll, Ol, Zu, SA between siblings-in-law of unlike sex not obscene. WS, Me, Li, Ll, Ol, Zu, SA between siblings-in-law of like sex not obscene.

2563-2566. Joking relatives. EN mother's brother principally. Mother's brother's son might maul you but you must not get angry. ST wrestled and joked obscenely with cousins of same sex. Ci man joked male cross cousins, not

female. WS, Hu cousins, but not obscenely. Me man joked mother's brother, obscenely or otherwise; woman joked mother's father; cousins of like sex only joked. Li grandparents, mother's brothers, man's male cousins. Ol cross cousins of like sex. No joking siblings, parallel cousins, or cross cousins of opposite sex. Practical jokes, as pulling off moccasins and throwing in mud, allowed; victim must not get angry. SU cross cousins of like sex only; man did not joke mother's brother. Wa grandparent joking relative. Zu, SA, SI joked all relatives; SA grandparents and grandchildren particularly. SI relatives who would not get angry.

2567-2570. Adultery. EN nose of wife bitten off or cut off, but husband must pay her or family. ST woman might have nose cut off, then dismissed; "You have a good thing now. So you can go along." Ci poor man killed rich adulterer quicker than poor on account his property. WM woman and lover killed; might lead to feud. WS wife killed; or nose cut off, hair shorn, and turned over to lover; sometimes compounded. Hu injured husband supposed to get father-in-law's approval through 3d person before punishing. Might tell parents of guilty man to warn their son. They might beg he take payment instead of killing; or might promise to warn son; or had warned him and he used harsh words, therefore he must take punishment. Me husband might warn guilty man's parents who remonstrated with him. If persisted and was killed, no vendetta. Li husband demanded property of wife's lover if did not kill. Ll, Ol injured husband notified wife's parents he would leave her; got another woman. SA husband whipped wife and lover for 1st offense. 2d offense informed governor, who imposed whipping or jail. An assistant whipped with governor's quirt, indoors in governor's presence. SI woman reported by husband to governor, who publicly whipped guilty pair. Man might divorce wife, retain children and house. If husband guilty, wife might report to governor. She would retain house. KP beating by husband and divorce often followed adultery.

2571-2576. Divorce. (Cf. also notes 2567-2570.) WN man took children, if wife got new husband. Woman kept if husband left her. EN inefficient wife divorced, especially if not cook; woman left lazy husband. Left unfaithful wife in possession of hut and children. ST if woman not good to look after children, man kept them; usually woman kept. SC man wanted divorce, left home. Ci if woman took children, man went on feeding them, but not ex-wife. WM spouse with most relatives kept children, for better care. WS in adultery guilty spouse deprived of house. Sterile woman might apply to shaman for aid to conception, to keep husband from divorcing her. Divorced woman remarrying might let 1st husband have children back. Hu sterile woman might plead for another year's trial. Man left hut in wife's possession, because easy to make another. Me misbehaving spouse forced to leave. Li also unfaith-

fulness ground for divorce. Man took boys, woman girls. Woman kept house, as man could make another easily. Ol woman's parents might take her if husband mistreated. SU "never adultery; never divorce." Wa adulterous woman divorced, but kept children. Woman always remained in house. SA "no divorce! Governor's rule!"

#### Death

2577-2636. Burial. Broke digging tools at grave: EN (sometimes), Ci, Ol, SI.

WN corpse decorated with jewelry. EN in rock crevice covered with stones and brush. Corpse taken out door. Hut deserted, hole made in N side to show death there, according to last word of goddess Iatlanata to whom belonged. Burned if wished.

NT buckskin under corpse for several men to carry out of house. Buried 5 mi. from village in foot-deep grave, lined with grass and buckskin. Rock wall built around, poles over top, stones heaped over poles, brush over all. Not in cave because living might use. ST only cave as well as rock crevice. Deceased in good buckskin clothes, wrapped in blankets. Carried by strong man 5 or 6 mi. away. Ground cleared, blankets and grass on which corpse placed full length. Leaned sticks against rocks over corpse, so as to make wall. Then flat rocks against base of sticks. More rocks so completely hidden. SC special opening on E side hut for removal. Strong man carried to burial place. Man buried head to E, woman to W. Grave covered with timbers, stomes, to keep out coyotes. Mourners not look back on way home. Ci 4 men carried on litter. Rock-crevice burial with sticks across, covered with stones (also WM). Must carry one stone at time; if 2, another would die. WM last look at corpse in grave; husband or wife cried. Each mourner left grave in separate direction; took off moccasins, clothes, and shook for fear dirt from grave carried home, which caused dream about deceased.

WS on horseback. Women washed, dressed female corpse, men male. Baby buried in cradle. Hu either sex dressed; carried out by 4 people in skin blanket; then on horse by man or woman holding it upright. If no horse 4 persons carried in skin blanket. Me carried out in blanket by 2 or 4 people. Buried on slope of hill. Sides of grave with stone lining. Earth on corpse. Rocks over grave to prevent rains washing out. Sometimes relatives "hired" someone to carry and bury; buckskin or horse to "hired" person. Only parents removed clothes in approaching corpse. Ol men carried corpse.

Wa slab-lined grave, 7 or 8 ft. deep, in clan cemetery. Wa, Zu cradle with baby. Zu grave tools washed in river, left on roof several days. SA swathed in blanket to neck for transport. SI swathed. One man carried on shoulders up ladder from room; sometimes second helped. Cradle not buried, broken and left at grave, or burned.

Only stillborn buried in house. KP rock-walled grave on hillside; no digging. Sticks on top, more stones.

2596-2599. SU corpse wrapped, carried by 4 men, placed on top funeral pyre, not within.

2600-2606. Property destroyed. Note 2577 EN. WN favorite horse killed, saddle on grave. NT personal property buried with deceased. ST dwelling and property therein destroyed; horses killed. SC if death in cave, things burned some distance away; property of others in cave not destroyed. All clothing of deceased in grave; only his personal property destroyed; horse or dog slain at home. In 1935 I saw automobile burned by brother of deceased. Ci bow and arrows in grave. Buckskins and good baskets not destroyed. Old baskets in grave; dog killed at camp. WM horse, not dog killed. Gun, bow and arrow broken before in grave. Clothes not torn before burial. WS personal clothing buried or burned. House sometimes for storage 3 or 4 years after death. Hu horse killed at grave. Me killed horse that carried corpse. Li tipi taken down, burned. Wa old clothes of deceased burned; beads, etc., buried; horse, not dog, sometimes killed over grave. KP 1 horse killed for deceased to ride, no dogs.

2607-2616. Soul destiny. EN: E, S, W, N, then to underworld, in one day. SC whirlwind turning right embodied good ghost; turning left bad. WM denied ghost in whirlwind, but prayed whirlwind not to come close. WS to skyworld. Hu returned whence came, viz., underworld. Me, Li left grave on day of burial, to underworld. Wa left body at death. Zu whirlwind in calm, clear weather contained ghost. KP 1 soul left at death; 2d in corpse till 8 days after burial, became owl. Only 1 name for soul.

2617-2636. Additional mourning observances. (See notes 2600-2606.) Wailing before death not formalized affair of Yuman tribes of lower Colorado river: WS, Hu, Li, Zu.

2617-2619. Hut, property, food. Supplies in house at death partially abandoned by Ci, WM, Me, Li, KP. SU abandoned all in dwelling cave if death there. ST, Ll, Ol, SU abandoned supplies near death house. ST maize and seed scattered broadcast. SC only things deceased used destroyed with house. Ci blankets of deceased only burned. Ci, WM half of food in hut burned with it, remainder removed. WM buckskins not burned, too scarce. Hu if deceased possessed 6 buckskins, 4 in grave, family retained 2. Zu after 4 days horse or 3 to 8 sheep killed; not at grave, cremated for deceased. SA food in room to grave, also his clothing; other things left. SI on 4th day food deposited at grave. Food and other supplies removed from room before death, not destroyed. KP abandoned supplies in brush for soul.

2620, 2621. Name taboo. Ci no payment to relatives before dance. Me might mention in respectful way. Li, SU no namesake. Zu name taboo 4 years. KP weak. Family might mention. Outsider hesitant in hearing of relatives.

2622-2627. Purification of corpse handlers. EN 2 corpse handlers sat apart in hut; water brought for them to wash; fumigated with burned cactus. SC buckskin clothes washed in yucca suds; Hu bundled up clothes, left at grave; or if returned to camp with them, laid away in brush; fumigated self with sage or juniper. Me relatives who buried corpse left some clothes near by "because sad"; fumigated with shrub branches. Li fumigated with everlasting flowers. Ll buried clothes. Ol fumigated with any kind of shrub. Zu fumigation by burning hair or clothes of deceased; moccasins of corpse handlers cleaned at river, lest grave mud in house. SA washed in river day of funeral. SI washed all over with yucca suds on 5th day after funeral. KP washed hands in plain water.

2627-2630. Purification of mourners. Disrobed before approaching corpse: EN, Hu (sometimes), Me (sometimes). WN mourners fasted 4 days; others denied. EN no food between death and burial; at end of 4 days went near grave, asked dead not to think about them. SC persons who lived in hut purified selves and buckskin clothing with yucca suds. WS close relatives nearly naked at funeral; parents discarded clothes, in brush or under stones. Me shaman prayed for bereaved so not dream about dead. If dreamed, went to shaman. Li mourners discarded clothes in bushes. Wa washed in juniper-leaf decoction. Zu not eat on day of death; fumigation by burning hair or clothes of deceased. Cleaned shoes of grave mud at river. SA male mourners washed in river, female with yucca suds, 4 days after funeral. SI washed all over with yucca suds day after funeral.

2631, 2632. Purification of belongings. Hu fumigated with sage or juniper. Zu if death from accident or wounds, room fumigated with piñon pitch. SI plaster scored or scratched in room, replastered. Notes 2622-2630 for clothes purification.

2633. Wa women scratched face. Others denied.

2634-2636. Mourning commemoration. Zu, SI at meals maize meal in fire for dead; Zu basket of food in fireplace on All Souls' Day and dead addressed; informant said she, not husband, addressed dead, probably matrilineal and matrilocal matter. SA daily food offerings in fire to fire, not dead; All Souls' Day food scattered outside pueblo. SI All Souls' Day food in river or in hiding places in mts. for dead.

#### DIVISION OF LABOR

2637, 2638. Wood getting. NT, ST, WM men helped, or got in snowy weather. Zu men got, children carried into house.

2639, 2640. House building. NT, Li men sometimes helped.

2641, 2642. Water carrying. NT, SC men sometimes helped, if far.

2643. Cooking. Hu man cooked in absence of wife.

2644, 2645. Skin dressing. SC old women rarely. WM man rarely; both sexes cut and sewed clothing. Me, Li man rarely, not regarded as capable as woman; Li both sexes made saddles. SI man made all moccasins and own buckskin clothing.

### "SLAVES"

Dubious to apply term to war prisoners forced to work for captors, though done by Father Berard (EDN, p. 259). WN, EN denied sacrifice at funerals. Obviously no groups organized to fully exploit slave labor. Furthermore "slaves" adopted or married women of captor group. WN inherited by brother or son. EN none early, only later "when wars." Those liked adopted. Did herding, agriculture. If misbehaved, sold for 1 to 10 plus horses; otherwise treated like own child. Apparently not clear-cut institution. Children of slaves, "1/2" slave (?); belonged to master. Children of slave and free man free. Wa denied, but in war small children too young to find home kept. Hano interpreter said Hano had Paiute and Apache slaves. Paiute slave in own family, whom uncle purchased when Paiute starving, died unmarried; treated as one of family.

Zu treated Navaho and Hopi prisoners well if no attempt to escape. Got wood. Son of Navaho prisoner by Zu woman at Zuni in 1935. Marriage to Zuni woman freed "slave," made Zuni citizen. Captor owner, but might loan to work for others.

2649-2654. Sex of "slaves" for certain duties. For herding and farm work, Wa, Zu used males; for wood gathering, Wa males; for weaving, Zu women; for cooking, Wa, Zu women; for milling, Wa women.

### LAND OWNERSHIP

2656. Hunting and gathering areas. Band owned, ST, SC. Boundaries natural features, SC, SI. WN paint too abundant for private ownership of quarries. EN deer blind privately owned. ST friendly villages hunted and gathered on uncultivated land; however, at Spring creek, semiband 2, large patch of plant producing edible seed. Owners allowed only 4 women (of 4 families) from ligaishak to gather; quarreled if poached. SC crest of Pinal mts. Yavapai boundary; no boundaries within Pinal area. Ci boundaries between band-hunting areas only if war. Carrizo and Canyon Creek bands hunted in Ci territory, vice versa. WM E White Mt. people hunted in Ci territory, vice versa; SC enemies. Hu friendly bands hunted over each other's habitats. Li, Me Tonkawa welcome in Li territory; Kickapoo and Comanche enemies stole horses. SU Pota Ute and Muwachi Ute hunted in Wemenuis Ute territory, vice versa. Wa hunting areas not village owned; no boundary between First and Second Mesa lands. Zu formerly owned from Ojo Caliente to Salt Lakes; no clan ownership of hunt-

ing and gathering areas. SA no boundary between wild lands of SA and San Felipe; hunted on each other's lands. SI Black Mesa (To<sup>y</sup>yu, mottled) boundary between Santa Clara and SI lands. KP no rigid boundaries between Papago groups. Any Papago hunted anywhere.

2657-2677. Agricultural land. Priority of consanguineal over marriage ties in inheritance of farm land outstanding; from standpoint of family rarely merging of wife's and husband's property, except in so far as offspring heirs to both. Family, rather than individual, ownership prevailed. In cases title vested in individual, really only usufruct title and land in trust for forthcoming generations of family. Clan control, but family ownership, reported only by ST, Wa. SA only group asserting assignment of unoccupied arable land to applicants by village council or war chief.

WN members of household family all planted in same garden. At death of man, family planted just the same. EN when man died, his farm became property of siblings, preferably brothers, if his children minors. Even his sister had prior right over his widow, though latter engaged in rearing his children. Widow might protest husband's siblings' taking land and threaten not to carry out levirate. Grown sons and daughters inherited from father. Upon marriage, woman's inheritance remained distinct from husband's, his from hers.

NT widow held husband's farm until death, when passed to dead husband's brothers. However, farm often abandoned after death of owner. Farms small (ca. acre) and easily duplicated elsewhere. Dwelling at farm. ST with matrilocal residence, husband worked wife's hereditary farm, which with his own was transmitted to their children. Man might inherit childless sister's land, as well as inherit from parents. Daughters inherited from parents. SC at man's death, family destroyed hut and moved away, but continued to work farm as family property; no special inheritance or division of land took place. Informant regarded this as tantamount to saying widow and children inherited. Ci inheritance by spouse occurred, but spouse's claim yielded before sibling's and before tendency to keep farm intact. If woman lacked children to inherit her farm she transmitted to brother. Thus dead woman's brother and her children were heirs rather than her husband, though her husband might hold in trust for children. Informant affirmed transmission to surviving spouse, from parent to child, from sister to brother, but failed to affirm transmission from brother to brother. WM generally speaking, surviving blood relatives inherited; but many cross currents of inheritance with both men and women owning farms: parents to offspring of either sex, sister to brother, brother to sister if former without children. Brother and sister might own farm jointly. If brother died, his share to sister, not widow. If sister died, her share to brother, and at his death to her children, not his children. Husband might inherit from wife if she had no siblings

and hold in trust for children of union; if man remarried new wife had no claim to farm, which inherited by man's children by dead wife. Brothers with separate households had separate farms owned individually. If crop of one good, other poor, they shared. Farms vested in man, family, or household that made them.

WS farms planted year after year, regarded as home. If left idle, anyone might plant. Apparently no definite inheritance rules. Me lone widow sometimes did not want to farm and gave up farm to dead husband's relatives. However, if there were grown children they farmed tract together. SU no ownership of farm land, only of maize planted. Reason, seldom planted twice in same place. 2 families never planted adjoining tracts.

Wa Sichomovi, 2d Hopi pueblo on First Mesa, really expansion of Wa, not separate entity, hence no question about land. It was all mixed. Tewa land, however, separate, to N of First Mesa. Wa farm land in continuous clan tracts, not scattered. Traditionally Bear clan owned all; as others came to Wa they gave them land. If family grew too large, additional fields obtained from relatives, not from clan as such. In case man did not designate heir to farm, it reverted to his clan. If man left widow and no children, his hereditary field reverted to his clan. If he had been working his wife's field, it still remained hers and her clan's. Oldest "uncle" in clan assigned land. Sometimes woman who held tract might designate daughter's husband as person to work land for her daughter. Assignment of tracts to individuals when family assembled, so no argument after death. Seems to have been transmission in all directions. Man worked both own and wife's land. Sometimes boys inherited from father, girls from mother. Woman might assign land to brother for temporary use.

Zu farms family owned, tracts within assigned to individual brothers. At death, their sons and daughters inherited. If man had only daughters when old, they inherited and sons-in-law worked farm. Widow without children did not inherit husband's farm. It went to his family. If small children, widow might hold in trust for them. Widower without children did not inherit wife's field; it reverted to her family. He might then make new field for himself where hitherto no planting. If no heir, land to man's clan, as constituting nearest relatives. Clan reassigned (?).

SA childless widow or widower did not inherit spouse's hereditary land; it reverted to family. If children, however, widow custodian as long as lived. With matrilineal residence, son's portion became his own when he married, as he moved to another house and his farm produce went there. Inherited land divided into equal strips between children. As long as family together, farm operated as unit. If person wished to increase size of farm he asked council or war chief for additional plot. That which he already worked was

transmitted to his heirs. In other words, arable land not cultivated assigned to those who needed it. SI at death, man's land to (1) his children, (2) his siblings. Widow did not inherit, unless small children; then held in trust for them; if remarried, she must transfer land to children. New husband could not take it. Each child got separate tract; no joint farming. If married woman owned farm in own right, it went at death to her children or, if none, to her siblings, but not to husband.

KP father owned farm; sons inherited. Father had no right to sell. Brothers lived together and worked land jointly, hence little occasion for division. Dying man might designate someone to look after his family and farms (incidentally), usually his brother, with whom had been working jointly; or his eldest son, who became trustee for younger children. If new land needed, no request to council, but another tract sought. Sometimes farm shifted from side of arroyo to other, if physical changes in land. As daughters married and moved away, they rarely inherited. In exceptional cases, when no one else to look after farm, daughter and son-in-law did so.

2672. Boundaries of farms. EN adjoining farms might have stick or stone; fields planted year after year. Ci stone markers for farms, no fences. Wa rock piles at corners which not moved under supernatural penalty of illness; no punishment by fellow citizens. Zu gardens fenced with crossed sticks, with horizontal bars resting in crossing. SA adobe walls for garden fences; also stones and stakes as markers; or strip of weeds left. Rock buried in ground at each end of field. SI fence of stakes and brush, or sometimes just brush. KP space of 10-12 ft. between tracts with different owners.

2677. Sale of fields. Zu acre for pair of leggings; 2 acres for blanket; sometimes for beads. SI acre for cow or horse.

#### PERSONAL PROPERTY

2678-2682. Ownership. Wa only woven goods actually given to wife by weaver belonged to her; farm products in fields were man's, in house woman's. SA men made yucca baskets, women owned.

2683-2689. Inheritance. NT apparently only personal belongings of deceased destroyed. If 3 or 4 buckskins, widow saved for children. If children grown, divided equally. ST man's undestroyed property held in trust by widow for children, equally divided among them when old enough. SC man leaving 10 or 12 buckskins, half buried with him, rest divided equally among sons, daughters, widow. Siblings inherited from bachelor. Ci buckskins most valuable movable property. Never destroyed. Inherited by man's children and widow, rather than his siblings. WM widow or widower inherited personal property not destroyed. If no spouse, grown children received, smaller

ones got nothing. Hu widow kept buckskins not destroyed to make moccasins for self and children. Me undestroyed property held by widow in trust for children. Bows and arrows of man put in grave. Buffalo robe, skin blankets, buckskins, food in part kept for family. Li widow retained some property for children. Ll, Ol horses only inherited. All else destroyed. If children small, horses held in trust by widow. Daughters inherited equally with sons. Siblings did not inherit if deceased had children. If childless man survived by widow and brothers, horses divided equally. SU bows, arrows, buckskins burned with man. If woman died, wooden dishes and baskets saved and used by whole family, not divided. Wooden cups and bowls made by men. Horses inherited. Some food saved, not all destroyed. Wa man's sister's sons inherited his personal property. Only with their permission or their parents' permission (brother and sister of deceased) might man's own children inherit. Modern tendency for children to inherit, rather than nephews, after whites. Zu sheep and horses divided among dead man's children. SA if man wealthy, all blood relatives and widow received shares; if poor, widow kept all for children. SI widow held until her death, when divided among dead husband's children. KP man's personal property destroyed at death. In old days no horses to inherit, later horses held jointly by widow and children. Siblings of deceased might get 1 each, but widow and children came first.

## WAR

2690-2696. Feuds.

2690. Vendetta sometimes followed adultery killing: EN, Ci, WM, Hu. WS adultery killing justified.

WN no intra-Navaho wars; killings compounded and clan of slayer helped pay. NT buckskins, dresses, moccasins, baskets, red paint, feathers, sinews paid in compounding, through chief as go-between. ST if relative died from witchcraft of known origin, justified to kill witch. Public opinion approved. Compounding for slain person through chief of killer's group. Maize, moccasins, caps, dresses, baskets, buckskins, etc., given bereaved group. All men of each group assembled. Relatives of murderer "did not want to be killed," so helped pay indemnity. SC compounding desirable to avoid further bloodshed. Ci murdered man's family and clan would fight to avenge him, proceeding against family and clan of killer. Threatened to kill young men and girls, unless compounded. Payment in buckskins, moccasins, arrows, bows, baskets, pots, food, etc. Clansmen of killer urged chief to arrange, lest some of them get killed. No ceremony.

WM vendetta not continuous; one killing to avenge first sometimes. This avoided by killer's relatives compounding. Murdered person's relatives sought indemnity through chief, sending

word to murderer's people to pay to "be even." Definite compounding ceremony: 2 groups met on appointed day. Both armed. Payees put "spear" in ground. Payers piled up goods to cover spear (buckskins, clothing, moccasins, mescal, metates, etc.). Each group had young woman behind it. If payers could not cover spear, their woman took off her clothes, walked through her line of men, put clothes on pile, walked back and forth in front of payees, then back to her place. This constituted completing payment; otherwise fight. Payees satisfied; all "shook hands," said they would be friends, ate together, etc.

WS chief arranged compounding; no ceremony. Sent messenger to arrange. Hu compounding murder with or without chief's aid; no ceremony; 1 or 2 horses, blankets, etc., paid. Wa informant told of near interclan fight. Dancer in kiva accidentally shot and killed man looking in from kiva opening. Fellow clansmen of slain man got weapons for revenge, but uncle of informant who was of their clan stood at ladder top and prevented reprisal. Zu accidental killing paid for by killer and family; clan not responsible. SA no fighting. If hurt another, jailed without food for 2 days, fed on third. SI indemnity for accidental killing or wounding. KP no vendetta following killing of adulterer. Sometimes villages involved in feud from unwarranted killing.

2691. Poaching. Little or no poaching or stealing within groups. Such procedure against other groups, however; Apache and Navaho notorious. EN interpreter's uncle stole horses from "Sioux." SC informant's father with war party of Pinal band which killed members of one camp of Navaho in revenge for killing. Place raided called Chokadjantan, within present Navaho reservation. SC took all Navaho sheep and horses to Pinal mts. WM fist fight but no killing over poaching. WS if another tribe tried to steal WS horses there would be fighting. Hu poaching supplies by another Hu family settled by fist fight, or club, or stone, or spear, or bow and arrows. Old people or chief intervened, as killing might follow, then feud.

Me stealing settled by restitution or payment of equivalent. Fighting among Me rare, until liquor came. Trouble starter usually killed. Raid for horses by 1 to 20 men. When Navaho agency at Ft. Sumner, one winter Navaho stole Me horses. Me saw Navaho encamped with them, prepared to fight on foot and horseback. Informant's father Me war chief, on horseback killed 12 Navaho with spear. "Only about 6 Navaho out of 200 escaped." Navaho had killed informant's father's brother, so revenge also motive for reprisal. Mexican shepherd also killed by Navaho who ran off with sheep he was herding for an American. Me recovered American's sheep and own horses.

Ll most war parties for horses, also to avenge killing. Informant never on war party. Ol "raids to recover horses, not to take them." Wa quarrels over land among Wa people, but no killing. Poacher

confronted with witness and restitution demanded; no bodily injury. No killing of Navaho and Apache poachers unless they killed Wa. Once Hopi ran off Navaho sheep as reprisal. Navaho pursued. Hopi got Wa reinforcements, drove off Navaho, escaped with sheep. Hopi messenger for reinforcements wore red cloth (2262) on hair, signifying war. Navaho started this "war" while agency at Ft. Defiance. 10 Hopi returning with rations, etc., attacked when camped. 3 killed, 7 escaped. Uncle of 1 slain man made war to avenge. Another whose brother had been killed at home by Navaho joined as coleader.

Zu Navaho attackers approached in arroyos out of sight in attacking Zuñi. Sometimes threw flaming torches on roofs. SI killing poacher permitted, no feud followed. KP no intra-Papago wars for poaching. War only against Apache.

#### War by Whole Communities

WN fought Ute, Walapai, Spaniards, Mexicans. Ute aggressors. ST raided Pima before ST had horses. SC enemies: Pima, Papago, Yaqui, Mexicans. Pima, Papago interfered with SC bringing home cattle taken from Mexicans; horses from Mexican raids traded to Navaho who came to SC country. Me no war party against Comanche, but against Mexicans. Comanche raided Me in mt. habitat, but always driven off. Wa Paiute, Apache, Mexicans, Navaho, Oraibi. Traditional account of trouble between Wa and Oraibi dated trouble from time Hopi lived at Sikyatki. Long-haired young Wa girl beheaded by other Hopi. Sikyatki and Oraibi then made war on Wa. Oraibi people reputed from Awatobi.

SA 2 war chiefs assembled men if Navaho attack threatened. Navaho stole horses. Scouts (2714a) in woods to watch. Killed Navaho and took their supplies of meat and fat in bags. KP no wars against Yuma, Cocopa, Pima, or Maricopa.

2697-2700. War council and dance of incitement. ST chief who planned war sent messenger to other villages, invited to come at once. When allies arrived sham battle, dogs killed, houses pulled apart. Before arrival, chief had weapons put under guard of 4 men to prevent any angry host shooting visitor. Danced 2 days and nights. After war dance, all polite, no arguments, not make fun of anyone, so all harmonious. On day of departure, civil chief told war chief to address people: "This day we're going to war. I want all of you to behave well, take good care that you don't get killed, because we are going to war against the (Mexicans) today." Departing warriors never told time of return, because might be killed. SC chief's speech concerning war against Pima, etc., because killed SC or took horses, cattle, etc. In sham battle, dogs killed, houses not wrecked. Arms of home people not under guard. Wrestling in sham battle by SC only. Ci sham battle with smashing of household utensils, dog killing, by allies who danced in long line from hut to hut. WM danced night before start; at dawn wrecked camp,

shot dogs, speared huts; to make brave. Then set out to war.

Me men who danced supposed to go on warpath. Men and women singers on one side of open space. Fire in middle. Warriors on opposite side. Women on other 2 sides. Each warrior boasted of someone already killed, thrust lance into ground. Not real coup counting. Li men and women in incitement dance around fire, outdoors, night. Boasted about horses taken and enemies slain. Next day went on warpath. SU fought Navaho when informant about 19 yrs. old (married). Also Plains tribes attacked Ute when Ute hunting buffalo. Informant not discuss war, chief's orders.

Wa war leader at 1st council instructed men to make bows and arrows. At 2d arranged details of campaign. SI dance of incitement in plaza, just men; painted; old scalps on pole. Carried weapons. Danced one night only. Next day went. KP at war council encouraged young men to go to war.

2701. War paints. Red, black, white (EN, ST); black, red, yellow, white (SC); red, white (SI); red, yellow (Li); red (WM, Ll, Wa, Zu, SA, KP). EN face and trunk painted; trunk black. As entered battle hair tied in wild tuft on top of head to "look like devil." ST face white, red, black for war dance. WM face painted for war dance; not on march or in battle. Me black, orange, red on face at incitement dance. Wa red clay on face, negative design with 3 fingernails.

2703. Continnence. ST, WM man slept with wife as might never have chance again. Ol woman not look in direction her husband went on warpath. Zu for 4 nights. SA no continence or fasting, as war call to repulse raiders. SI 1 or 2 nights.

2704. Dreaming ominous. If warrior bad dream, of death, did not go (NT, WM, Hu, Me [sometimes], Li, Wa, SI). For shaman's bad dreams see 2713. NT chief's dreams not heeded; i.e., if dreamed some killed, party went nevertheless. SC war dreams denied. Hu chief bad dream, urged party not to go. Me dream ominous, might not be heeded by warrior, who later became frightened and returned. Li required no vision or dream. SA man, bad dream on 1st night, remained at camp to care for food, with war chief's permission. If war chief bad dream, he selected substitute and remained. KP only shaman's ominous.

2705. Arms. ST all carried bow and arrows, some spear and shield also; mescal-fiber rope around waist for horses. WM some young men unarmed, carried food. WS some with spear and shield if medicine power. Hu some without weapons, especially younger men, tried to seize enemy. Some warriors bow and arrow, some spear; but no organized groups of archers, spear bearers, etc., as on lower Colorado r. Ll some only lance or spear; some bow and arrow. Wa bow and arrow, boomerang, stone ax, double-edged flint knife, spear. Knife, club (ax), spear for close quarters. Men assembled for leader to see if prepared. SA all bow and spear; some also shield or club. KP only those with club carried shield; archers no shields. War club (1214a) had buckskin cord for wrist carrying. Club users bravest men.

2706. War leader wore distinctive attire. Buckskin skull cap with feathers, EN, NT, ST (cap painted), SC, Ci (6 to 8 eagle feathers on top), WM (also on festive occasions), WS, Hu (medicine power to wear), SI (also anyone else might wear), KP. War bonnet with horn (Me). Buckskin bandoleer with eagle feathers and turquoise, bullet proof (ST). (Cf. notes 2710, 2711.)

2707. War bonnet for bravest. Me nonflight obligation; after return transferred to warrior if outdid original owner in bravery. Ol not worn because in way; war bonnet from enemy property of taker.

2708-2710. Novices on warpath. EN sat like women, feet folded under. ST on first trip, head scratcher and drinking tube of grass, tied on one string. SC head scratcher and drinking tube for 4 days; practiced running before warpath; mescal principal food of all on warpath. Li novice buckskin cap with horsehair ornament each side. Ll buffalo-fur cap.

2711. War cap worn by others than leader. (Cf. notes 2706, 2710.) EN war leader buckskin cap with owl feathers; others also. SC cap with turkey feathers. Chief's only had 2 eagle feathers in center. WM buckskin cap different from leader's, which had eagle feathers. Some string under chin to hold. WS buckskin feathered cap by shaman, also war leader and warrior if knew medicine. Hu any who had proper medicine, from clown or from gan spirit (chadjade) at rock cliff. Sometimes gan came to seeker in waking vision. Ol narrow rawhide cap held by chin string; top with porcupine hair and 1 erect eagle feather.

2712. Clothes discarded before battle. EN naked except paint. Hu moccasins, breechclout, war cap retained. SI in summer.

2713. Shaman on war party. NT shaman's dreams bad, party did not start; on warpath predicted losses of party and enemy, by singing; if warriors discouraged turned back. Caused rain to obliterate tracks. ST war chief was shaman, made rain, wind, hail to cover tracks, or storm to catch horses easily. SC prayed, etc., for success. Ci dreamed of best route, told in song. Made rain to obliterate tracks, wind blow sand in enemy's eyes. WM led singing 2d night out, form of prayer to Nayitizone, grandson of goddess Istenatlehe. Prayed for rain to cover tracks. No water sprinkling to induce rain. If bad dream might induce party to return, wait month. WS prayed, sang, made rain to hide tracks; sang to determine outcome, predicted who killed if fought. Hu dreams ominous; closed eyes and "saw with his mind"; might say on morrow battle and success; might see something dark over warrior whom advised remain in rear lest killed; knew what impending in all directions; prayed and sang to god Nayitizone for rain to hide tracks, or stop excess rain. Smoked cigarette, prayed, sang; others prayed too. Interpreted dreams of others and might delay for few days if bad; might later get favorable dream and proceed. Me prayed, no sing-

ing, no vision. Predicted outcome by feeling inside body. Might say, "Go ahead. Don't be afraid of enemy. They are already down." In wind heard guns, meant no harm to party. Sometimes 2 shamans. One could see black powder in breath of others, good omen. Li chief business of shaman (di<sup>n</sup>zi) was telling about enemy through prayer and song; smoked cigarette when praying; showed party right road; predicted outcome by dream, not waking vision. Sometimes leg twitching revealed. No weather control. Ol prayed for warriors; could not produce rain. KP only dreams of shaman ominous; had assembled warriors sing; stood in middle, did not sing, but saw far and into immediate future. If saw "man" fall dead, good sign. If saw reddish color in mass of dark, bad omen, but pushed on against enemy. No ceremony of divination.

2714. Women accompanied war party. EN 1 or 2 armed with bow and arrows. WS woman shaman might go; young men did cooking. Hu woman to induce men to get horses for her; did not enter battle to scalp, waited behind with water for men.

2714a-2717. Scouts. 2 at least, so if one killed, other had chance to warn. EN scouts uttered owl, coyote, or whippoorwill calls. NT 2 preceded war party; scouts and main party made fire with conical pile of wood, so no smoke visible! SC, Ci scout signaled with buckskin; no smoke for fear enemy see. Ci no owl calls. Smoke on distant mt. to inform of return from acorn gathering or war. WM buckskin thrown in air as signal to wait. No smoke signals lest enemy see. WS smoke signal on hilltop meant "enemy too strong to be attacked." On hillside, easy to attack. Hu sometimes more than 2, in different directions. Smoke signals behind ridge so enemy not see, to indicate approach of enemy. Me smoke signal danger head. Hand along eyebrows if scout close meant enemy at hand. Signal with shield or buckskin to go back if enemy close. Li scouts ahead and behind. Wolf and "fool quail" calls. Ll one returned to inform. Ol sometimes owl call; oftener turkey call with deer-bone tube, by sucking in breath, meant enemy close. Wa usually at night; reported to main force; no heliograph signals. Zu in pairs at night looking for enemy campfire; returned before daybreak. SA special whoop of warning; if enemy within hearing, waved white cloth or buckskin. SI sometimes heliographed with shiny stone. KP reported back, no signals.

2718-2720. Omens. Note 2713. EN if coyote crossed trail, warriors turned back. Shaman told by stars if party to be successful. NT, ST animal falling dead, blood on ground, warriors returned. ST to ascertain sort of animals party would take, war leader (shaman) drew on ground tracks of deer, mt. lion, cattle, horse, and sang over these. If cattle and horses indicated, success against enemy; if deer and mt. lion, no success and only wild animals. SC returned if rattlesnake in trail or anything fallen in front of them. Shaman 12 songs at night, accompanied by warriors,

then foretold success or failure. Ci rabbit falling dead, bad sign. Finding dead rabbit nothing. Hawk or eagle-catching prey nothing. WS no induced omens other than shaman's singing. He heard voice above, could tell good or bad luck. Hu no omens from animal dropping dead, etc., since shaman seer saw all that impended. Zu animal falling dead in front of warriors bad omen, but kept on; oracle by decoction of toloache root to sound young man before warpath; he told what he saw. SI something falling dead bad sign, priest might order return. Bear or deer crossing in front of warriors equally bad, caused return. KP coyote howling near camp, close approach of enemy. Feather omen of Yavapai type (Gifford, 1936, p. 303) not found.

2721. Also line-up battle in open, Me, Ll, Ol; close-in mass fighting, Me, Li, Ll, Ol, Wa, KP; contest by champions, Me, Li, Ll, Ol. ST ambush favorite; if wagon train, or Mexicans driving cattle, warriors lined up behind bushes till victims abreast, attempted to kill all; war chief shot first. Never attacked soldiers' camp. SC war leader urged men to stand and fight, even when U.S. soldiers getting best. Hu surprise attack before dawn. Li champions fought with spears. Ll also fighting in open, usually horseback. Ol surprise attack if possible; if enemy lookouts discovered, Ol turned back. Wa pincers movement on camp to be surprised. War whoop by leader signal for attack, usually sunrise.

2722. War priest. Apparently Pueblo war priest similar to Apache shaman on warpath. Zu war priest or priests accompanied party. 1935 only 3 war priests, formerly many. War priest was war leader, also witch executioner. Slayer of Navaho thanked by war priest. Later might be made a war priest. Scalp takers made priests at victory celebration. SI war priest made medicine.

2723-2732. Prisoners. Notes 2646-2655. NT captured Pima girls, killed men, women, and boys. All adult Mexicans slain, but boys taken, reared, allowed to marry. Pima girl captives married. ST "slaves" were Mexican or Pima boys, girls, women. Treated like members of family, adopted. They got wood and water. When married, ceased to be "slaves." Wife and children inherited "slave" from deceased man. SC some adopted Pima and their descendants now among SC and Ci. Ci adults slain; only children prisoners, married into tribe when adult. Captive called esnûn. Me women captives forced to work if not willing to marry. Ll prisoners "made into Apaches." Ol story of Jicarilla captive woman who escaped from Kiowa on horse furnished by Kiowa woman. Reached her people encamped near El Vado, New Mexico. Wa children prisoners kept and worked, not adopted. "It would not look right to take an enemy into family." When adult, free to return to own people. Zu some Hopi men and women came to Zuñi long ago when starving; became Zuni. SA no prisoners taken; enemy women and children too far away to bring home. SI after 2 or 3 years captive woman might marry. KP sold to Mexicans, especially Apache children; not enslaved or adopted.

2733. Hair made into effigies. KP, HP kept hair of slain enemies, especially Apache. KP when enemy killed, messenger hastened to inform slayer's people. Hair inherited by slayer's son. Little effigies made of it, kept in baskets; soul of slain enemy supposed to reside therein. Made by men who attended warriors under taboo for enemy slaying, 4 days after victory dance (2742). KP took Apache ears for bounty. HP basket with hair effigies in pot; old woman caretaker. At her death buried, but not with her.

2734-2741. Scalps. NT Pima, but not Mexican as short haired. ST only one after battle, whole hairy portion with ears, sometimes; carried home on pole. SC took heads only when serving in U.S. Army, at order of commanding officer. Ci scalping only after whites came; booty, including clothes of slain, formerly taken. Hu learned scalping from Mexicans. Me Mexicans and Americans not scalped; only Comanche, in retaliation for their scalping; whole taken, then small round piece cut out, rest thrown away. Selected best-haired Comanche. Experienced warrior prayed 4 times over it. Then cut 4 times clockwise. Washed free of blood, combed, fastened on stick. Fear of scalp (?). Kept and used by singer of war songs. Sometimes warriors kept pieces in little skin bags. Rest thrown away. Li no scalps till Comanche and Kickapoo started practice. Only 1 or 2 after battle; washed, smoked, combed, put on 5-foot stick. Story of Lipan young man scalped by Kickapoo, where lay in bottom of arroyo, feigning death. He held skin together, tied it, lived to be 70. Ll scalp embroidered and kept by scalper many years, stored with clothes in rawhide bag. Only 1 scalp, always of first enemy killed. War bonnet and clothes of slain enemies taken. Ol all slain scalped, scalps kept by scalpers; dried, not ornamented; buried with owner at death. Wa scalped Apache, not Navaho, because Apache brave, Navaho not. Scalped only best enemy fighter. Washed with yucca suds at pueblo, to preserve "forever." War leaders in charge of scalps. People in general feared to touch. Special place for scalps among rocks at foot of point of Walpi mesa. Scalper might say, "I'm taking scalp for So-and-so," mentioning name of member of warrior society. If member not there, given him on return home. If no such declaration, scalper automatically became member of society, forced to assume bravery responsibility. Zu scalped only certain Navaho. Scalper carried scalp in hand; made a war priest. If war party returned in morning, waited outside pueblo till evening. Scalps on poles. Scalpers did not enter pueblo. Wives visited them during day. After ceremony, scalps in pot covered with flat coiled basket (woven counter-clockwise after victory dance ceremony, 1601, 1602), then stone, in hole near present Zuñi day school. Ants ate them. SA all slain scalped, lest bad luck; spread to dry. After dance, kept by special custodian in one room. No offerings to scalps. SI rubbed dry with pottery tempering material. Kept in special room in pueblo, in charge of old man (not war chief). He only touched, others afraid.

Any man who touched could not sleep with wife for 12 nights. KP only one after battle, but from others slain hair taken (2733); scalp not washed for dance; others than scalper feared to touch.

2742-2756. Victory dance. Maximum duration in days (nights): 1 (EN, WM, WS, Li, Ll, Ol, KP); 2 (NT, ST, SC, WS, Me, SA); 4 (Hu, Wa, SI); 8 (Zu).

WN modern squaw dance a "victory dance." NT woman carried scalp on pole. ST at home with scalp on long pole, sometimes sotol stalk. Old men and women danced 1 or 2 nights around fire with it. Burned. No fear of scalp. Face and body paints with clan designs. Various ways of dancing: At night 4 to 10 men danced first in moccasins and breechclout only. Carried rifles, bow, arrows, shields. Threatened spectators. Man with gun shot powder (no bullets). Rawhide mat on ground on which each danced in turn. After midnight social dance with women, in circle facing fire; also back and forth, 2 lines facing, women in 1, men in other. Also 2 girls and 1 man danced together, man facing 1 way, girls opposite. Woman with scalp danced in front of man who had taken many horses, saying she was dancing for horse. He had to give one to her. Ditto for blankets, etc., taken from enemy. When woman received it she sang song: "Thanks. Thanks. This for me now."

SC messenger in advance of returning war party. Women went to meet armed with spears and bows. Speared one of horses brought by most distinguished fighter, danced around war party, saying, "You are the best fighter. I will take this horse and some cattle, too." Sweat bath; victory dance 2 days later. Chief announced how many enemy killed, etc. Ci dance of 2 women and 1 man between; man faced opposite way, but faced about whenever he liked, then women had to reverse. After dance, allies went home. WM old woman danced around fire with scalp. WS dance began outside camp; then into camp by home people, while warriors rested. Danced at night, too. Woman, thinking of brave relative, seized yucca-stalk pole with scalp and danced. Hu circle dance first; then lines facing, women in 1, men in other. Scalp on 3-ft. pole, inserted through 2 holes in scalp.

Me women rode to meet returning warriors. When near camp men stopped to paint black, red, white for victory dance; no paint for battle. Victory dance 1 or 2 nights or longer. Also day dance. Women danced, made cry with fingers over mouth. Scalp carried on 10-ft. pole by men only. No scalp taken if any losses. No individual coup counting at victory dance; only statement of how many whole party killed. Comanche hung Me scalp on bridle. Me did not. In day, singer in center of ring of dancing warriors, outside them was ring of dancing women; all counterclockwise. To W of dancing people sat group of warriors singing and beating rolls of buckskin with hands. N and S of circling dancers were 2 groups of dancing women, who did not circle. In night dance pottery drum for accompaniment. 2 rings of women encircled fire in opposite direction. At 1 side danced men

with scalp, not circling. About midnight circle dance as in daytime. 2 days after dances described might have partner dance, 1 man and 2 women in each group. Scalp already disposed of.

Li warriors shouted when ca. mile away to inform home people. If any dead, no shout, no dance. Women carried scalp on pole in dance. After 4 dances threw into brush. Ol in dance scalp carried on stick by scalper, not woman.

Wa 4 nights of dancing in plaza. Younger people at sundown, older people about midnight. Danced in circle, sexes alternating, counterclockwise. Songs referred to recent war. Mention of battle place followed by war whoop. Zu war priest went ahead, shouted from distance to village, telling men to come and meet returning warriors. Victory dance in plaza. Navaho scalps on 1 post, danced around. Danced in 3 rings; girls and women in inside circle, men in middle and outside circles. SA red face paint on all male dancers. Line of men with line of women behind. Same on opposite side. Lines danced sidewise in daytime. Men carried scalps on separate poles. SI in victory dance different men carried pole with scalps. Danced clockwise around fire. Scalps kept for later use in war incitement dance. No women in incitement or victory dances.

KP danced 1 night only, near village, not in it. Slayers took no part, as under taboo. Older women carried scalp on pole, then set pole back in ground again. Victory dance without scalp as long as some enemy killed.

2757. No real purification of slayer. EN if defeated, returned singly; no sweating followed. Ci only sweating and bathing for cleanliness; no fear of slain enemy. Li only customary washing.

2762. Continnence. Zu (4 days), SI (12), KP (30).

2764-2766. Wa scalper secluded 4 days, no part in victory dance, no meat or salt. On morning of 4th day, scalper and scalp washed in yucca suds (2d washing of scalp). Scalper's whole body washed by father's sister; special pottery bowl used. Up to this time not bathed. Threw clothes over cliff, making 4 passes around his head with each garment. Zu slayer no meat or salt 4 days (1st 4 days of victory dance); scalper's clothes left in bushes. His hair washed in plaza before dancing, by wife, sister, or mother. There put on clean clothes. SA slayer vomited after return. SI washing and vomiting by slayer after 4-day dance. Slayer in kiva in daytime; not near women or children.

KP war leader purified slayer. Shaman with war party to divine, not purify. Siachokam, title of old enemy slayer who helped to cure another ill from improper care after slaying enemy. Siachokam no shaman (makai) in true sense. He also treated person ill because relative killed an enemy and did not properly care for himself. Purification for scalper no different from other killers. Fasted from meat and salt 30 days in corral. Wounded man remained mile away from village where cared for by men. Did not go home because "dangerous."

2771. War societies. Wa note 2734. KP none, but

young men exhorted to defense in regular speeches of Keeper of Smoke.

#### POLITICAL ORGANIZATION

All Apache except perhaps NT seem to have had autonomous bands. W Apache, except perhaps SC, had apparently autonomous villages within bands, or at least villages land owning. ST examples indicate villages smaller units than Goodwin's semibands (AA 37:56). This matter definitely connected with chieftainship, number of people under chief's control, and territory belonging to group. Among W Apache, problem of relation of band and clan, discussed under chiefs (notes 2779-2802) and under clan organization (notes 2803-2820).

2772. Bands, autonomous. Bands apparently loose aggregations of local groups bearing band name: WS, Hu, Me, Li, Ll, Ol, SU, KP, HP. Lacking band name among W Apache. To local groups reference made by locality in which dwelt. Thus, Hu of Shaiahene band recognized no subdivisions of Shaiahene, but referred to places where lived or from which individuals came. This approaches W Apache concept of clans, but is not clanship. Shaiahene more frequently made reference to wealthy man (headman) of each group; thus, person said to belong to particular headman's group. No group practiced band exogamy; blood relationship sole deterrent to marriage. WS bands Chokalene and Chihene; with them mingled a few people of Inde<sup>2</sup>dai band from below international border, some also with Shaiahene, as were also some Chokalene and Chihene. Evidently these 4 bands (Chokalene, Chihene, Shaiahene, Inde<sup>2</sup>dai) constitute so-called Chiricahua Apache. See Notes on Habitats; also chiefs (notes 2779-2802) for political situation. Cf. Castetter and Opler, 6.

Me bands Kahoane, Ni'ahane, Huskaane. All friends. See Notes on Habitats. From the government they got rations at El Paso, Texas; later at Ft. Stanton, New Mexico. For political relations see chiefs (2779-2802). Li comprised E or woodland band called Chishene (timber people) and W or desert band called Tuensane (big water people). With Caucasian pressure E band moved W and merged with W.

Ll called themselves Gulgayi (plains people), Ol called themselves Setide (sand people). These bands included unnamed semibands, each under headman, who seem not to have claimed definite tracts. Ol estimated 200 as average of each of 5 Ol subgroups, probably overestimate. Children of mixed parentage (Ol and Ll) belonged to band where resided. No exogamy rule.

SU data refer to band Wemenuis (shaking all the time, in reference to quickness of action), so named by neighboring Pota band. Ute band to NW was Muwatchi (houses covered with juniper bark). Pota band named for Pota, a rocky peak, viz., Chama peak, Colorado. All 3 used term not (person; plural, nochi) for Ute or Paiute.

2773. Villages, autonomous. NT, ST villages, in case of ST at least, were units within semiband. Parenthetical plus for KP in element list casts no doubt on existence of villages, but on existence of absolute autonomy. During planting season KP villages broke up into family groups which lived near cultivation. NT of Fossil Creek band had 3 villages in Strawberry valley, high, fertile, with perennial stream, all under one chief. From E to W villages Büchan, Tankekedoke, Ma'na'ches. E and W villages 2 mi. apart. Yakohikain clan (2803) preponderated in all. Ci no real villages as farms scattered and owners lived near cultivation. Farm constituted home place. However, much moving for wild crops. SC no real villages; nor WM, who "camped around hidden in brush formerly." Present village of Yangokai (wide flat), near Ft. Apache, modern. Other groups without villages: WN families lived scattered. Hu, Li, Ll, Ol no villages, constant shifting. Li shifting largely due to following buffalo.

2774-2778. Council. ST chief called in subchiefs and family heads to discuss serious questions concerning hunt, crops, gathering, war, etc. SC chief called to his house important men with "good words" to discuss planting, gathering, war, etc. Heads of families invited. Ci chief called people together at acorn time to discuss gathering. He said those who wished should go, others stay; council, if any, very informal and comprised family heads. WM family headmen called by chief to discuss going for acorns, etc. Dissenters could wait and go later. WS council informal meeting of male elders; women might attend but did not speak. Chokalene and Chihene lived in same region, but each had own chief and council. Hu merely family heads. Chief discussed with them any proposed move. Li council comprised local headmen, selected by constituents because kind-hearted, good fighter, etc. Meetings about buffalo, antelope, deer hunt; feast and dances with friendly tribes; local-group chief consulted with family heads about local affairs. Ll council discussed all things connected with band. No witchcraft admitted. Council met at call of chief (nanta), where chief lived. All males attended who had become of "age" (15 yrs.). Old men did talking. Ol council comprised subchiefs and adult men, no women. KP council called chiyenix (literally meeting). All men attended and smoked; only men over 50 and head of family spoke. No emblem carried by councilor. Discussed hunting, gathering, enemies, ceremonies. No judicial functions.

2778. Where family heads constituted council, life tenure implied, hence pluses in element list. Note 2779 for further references to council.

2779-2802. Chiefs, etc.:

2779-2784. Transmission of office. See also note 2803. NT Chiquito, of Yakohikain clan, chief of 3 villages in Strawberry valley, succeeded father as village and clan chief; latter

of special interest, since, with matrilineal descent, his father of different clan from himself; tantamount to saying only village chief. SC patrilineal or fratrilineal, only matrilineal if above succession impossible. Civil chief, nandûn. At war council warned people to be careful. "If want to go and fight, all right. If not, stay at home." Ci chief called people together; was both clan and local chief. Many constituents married-in men of other clans. No 2 clan chiefs in 1 community. No band chief over all clan chiefs. Sometimes new chief son of old, hence of different clan. Subject to approval of people. Thus "chief of clan" really local chief, not always member of clan over which chief. WM no village chiefs formerly, but clan chiefs (2807); called nandûn. WS chief (nantûn) from father to son or near relative, selected by people. Chokalene last head chief was Mangas Colorado. After him, Victorio and Apache Loco, 2 Chihene men, were appointed chiefs simultaneously by a joint council of Chihene and Chokalene. Victorio was sister's husband of the preceding Chihene chief (who was mother's father of Mrs. Roger Toklanny, WS informant's wife), and had his seat in Ojo Caliente region of central New Mexico. Prospective heir might decline. Local groups or camps had local chiefs, also called nantûn. On occasion assembled to confer with head chief. Geronimo, a Chokalene man, was no chief; he lived in SE Arizona. Hu nant'a, chief. Several camps under band chief. Each camp had headman (wisest man) called nant'a too. Dying chief designated successor. If brothers and sons declined, people selected another. Cochise, Shaiahene chief, was of Chokalene band; succeeded by oldest son, Staze, who was followed by his younger brother Christian Nayischi, whose mother was an Inde<sup>d</sup>dai woman. Me nanta, chief, worked like anyone else. Anciently chiefship to brother or son; later, people selected wealthy, good-hearted man with many friends. Heads of families informal council for selection, or discussion of other matters. Chiefs of 3 Me bands before 1872. Kahoane chief, Chianacha (he came back to his name) or Caneta (Mexican name). Ni'ahane chief, Neschu (yellowish); succeeded by Donso, a relative, before reservation founded. Huskaane chief, Nikale' (brave man); succeeded by no one, as people dispersed, some to Mexico, some to mts. of Ni'ahane people, on account Comanche raids and whites. With 3 Me bands assembled through pressure of whites, Chianacha regarded as chief of 3. Killed near La Luz, on way back from Las Cruces where called by Mexicans for conference; his Mexican interpreter killed near White Sands National Monument. Li formerly 2 Chishene chiefs, 1 Tuensane chief. As Chishene diminished 1 chief only; as coalesced with Tuensane, 1 chief for both. Chief, also headman of each camp, naneta'. Chief of Tuensane selected by headmen. Good-hearted, brave, personality were requisite qualities. Ll oldest son succeeded; no headmen for separate groups scattered around. Pablo, last

Ll chief, succeeded father's father. Ll, Ol, about equal in numbers, had separate chiefs. No head chief of 2 together. Ol chief (nanta) replaced by people when too old. He might suggest this, or people take initiative. No named subdivisions of Ol, but 5 contemporary local chiefs. These not territorial, but leaders of roaming semibands, selected by people. Gwedemoto (tongue tied), head chief of Ol when informant boy, informant's mother's maternal uncle. Subchiefs Valarde, Camillo, Vicente, Jose Martin, Montaleon. Montaleon, subchief (nanta) for informant, "grandfather" through informant's mother. Vicente and Jose Martin, maternal uncles to informant. Camillo, informant's maternal "grandfather." These 5 had no successors; were chiefs when Jicarilla at Mescalero, from which moved in 1887. No successors because government put 2 men in charge, Guerito and Augustine, who had been to Washington and negotiated for present reservation. Old chiefs ceased to function. Apparently chiefs selected for 5 semibands, sometimes relative of preceding chief: Guerito, son of Gwedemoto, and brother of Valarde. SA informant volunteered statement governorship Spanish.

KP head chief ("king") of all Papago resided in A'asatse region. This statement an exaggeration, as HP and Sand Papago not included. Djüya-chükchin (smoke keeper), title of civil chief of each village and of head civil chief. Presided over council meetings. Office hereditary in male line, to oldest son. People had no choice as to successor. Smoke keeper might belong to any clan. No moiety chiefs. Smoke keeper as magistrate (Spanish?) if wrongdoing. Fixed indemnity to be paid injured party. In murder cases, death inflicted after his consent. Relatives of murdered man were executioners, sometimes without consultation with smoke keeper. Killing on basis that murderer might kill someone else. Joint responsibility of brothers of murderer not recognized; only murderer's death sought. If possible, smoke keeper induced relatives to waive punishment. Smoke keeper tried to prevent killings by admonition at nightly meetings in which he or councilmen admonished people on proper ways of living. No women present. Chief ruler at Santa Rosa. Limited autonomy of villages. Some matters not settled locally taken there. On occasion local chiefs assembled at Santa Rosa to confer with head smoke keeper. Sapukamhimkyutam (man who leads in right way of living) had charge of ceremonies such as rain and vigita. (Other titles for this functionary were imatethabuwa or imatetsumasim [the one who knows procedure].) Life office, transmitted to oldest son. Duties wholly religious. Lived at Kuitak. Assistant with same title in each village. Consulted with head civil chief at Santa Rosa when ceremony of general import, such as quadrennial vigita at Santa Rosa. Goddard's "village crier" (p. 138) was "keeper of the smoke" himself.

HP djandjilki (keeper of smoke), chief of

village, succeeded by oldest son. No supreme chief over all villages.

2785-2788. Chief's insignia, duties, house, etc. Notes 796, 2779. NT farmed and hunted for chief. Women told to gather seeds, mescal for chief. Chief's wife gathered also. Chief fed poor people; "that was why he had big house." Chief's house was place family heads discussed matters with him; not place of assembly for all people. ST chief always traveled with 4 attendants. Worked on farm, but not allowed to carry loads. Replaced when too old. Duties: care of people; harangue before sunrise about deer hunting, seed gathering, etc. Urged people not to quarrel, to live right, etc. Ditto evening. Talked from knoll; called out twice before speaking. SC chief dressed like others; farmed; hunted; no insignia. Directed when to hunt, plant, to save maize for winter, etc. When not hunt, got share of meat like others. Might have 6 wives and 6 huts. Ci sometimes constituent worked on chief's farm; no formal pay even in produce. However, chief noted for liberality, so volunteer had been or was later paid. In selecting chief, generosity and willingness of himself and wife to feed people counted. Chief harangued before sunrise from elevation, every 4 or 5 days. WM buckskin cap with 2 eagle feathers, chief's insignium. Hunted and farmed like others; addressed people daily from small hill before sunrise. Had bigger house because entertained people from afar, who slept there. Feasted people; generous, helpful. WS chief talked from small eminence near camp, warning to beware enemies, be good to one another, not fight among themselves, be industrious in food gathering, etc.; told women to gather, men to hunt. Hu chief addressed Shaiahene by terms of relationship, as my brothers and sisters, etc. Chokalene, Chihene, or Inde<sup>d</sup>dai in same camp addressed by relationship term. Chief's house slightly larger, for gathering of elders. Li local chief advised constituents, etc. Often orated in early morning and evening, warning if enemy seen in vicinity, admonishing about behavior to one another, food gathering, etc. Ll some men hunted game for chief. SU chief harangued every morning, standing within earshot of dwellings. Wa chiefs never wore feathers on head as in Goddard's frontispiece. KP apparently no preferential treatment of smoke keeper (chief), who hunted and farmed. His house for council meetings. Informant denied council house (Underhill, p. 15).

2792-2796. War-chief office. EN selected by warriors, held office many years. Civil chief did not go to war. NT chief knew medicines; "that was why he was chief." He knew war medicines, hence war leader. ST war chief, selected by civil chief, had charge of war dance. Held office until too old. On warpath was real head of party; not civil chief who might also go. On way, war chief told men to spread out, hunt deer, meet at certain spring. SC nandun bichedicheni, war chief, literally chief's lieutenant, second word Apache-

ization of "lieutenant"; sometimes several who headed separate parties which might unite. Had some medicine power. Ci chief or any man could initiate war party. WM any brave man could initiate war party, called nandun, like civil chief. Formerly head chief Bichaschizi of whole E WM band was also war leader, led people to Mexico to fight. He was Bistaha clan man. Clan chiefs followed him to war. Ba'as, incumbent, 1935, no relative, succeeded him after he was killed; band chief selected for war prowess. WS war party selected leader approved by civil chief, called nantun temporarily. Sometimes civil chief might lead. Hu war leader, nagatyoyen nant'a (war chief or war leader), was shaman. Sometimes civil chief on warpath might try to deter warriors if he had bad dream. Me naguntenya nanta', war chief, at one end of line of warriors, civil chief at other. Foot warriors fought between lines of mounted warriors. Civil chief sometimes leader in battle, if famous warrior. Man who distinguished self in battle made war chief by his warriors, not by civil chief. War chief had medicine power. Li war chief, nagusteyenaneta', not leader for buffalo and antelope hunts, but civil chief was. No police for buffalo hunt. Man located animals, reported to chief, before hunters set out. Ll man who initiated war party was leader; no dream necessary. Chief sent messengers for war-council gathering. Ol subchiefs as war chiefs; no separate war chief. No specially brave warrior selected to lead in warfare. Ol and Ll allies. KP chiyihim, war leader. Not appointed by anyone, took responsibility himself. Expedition discussed in council, other villages visited to enlist aid.

2798, 2799. Head woman. ST head woman called woman chief (honorific), industrious, hospitable, with plentiful supplies, ideal of what woman should be. Addressed people like chief, suggesting women get seeds in hills. Admitted to council, but did not talk. Ordinary women not admitted. SC woman chief (istun nandun) urged women to gather wild foods. Was one who had taught her children to gather industriously. Other women admired and appointed her chief woman. Ci woman chief called nandun (honorific) because generous with food to other women; not necessarily wife of chief or even relative. Was leader for food gathering. Suggested to women when to gather seeds, etc. WM chief's wife earned title of "good woman" if generous to people short of food. WS well-to-do woman who feasted visitors lavishly regarded as head woman; advised women when to gather, etc. Respected because provident. Not office; no title. Li chief's wife in charge when men away. KP wife of keeper of smoke was chief for women; called "woman keeper of smoke." Older women smoked. Her duties concerned games played following killing of enemy, when villages contended, men vs. men, women vs. women. No duties with respect to gathering food.

2800-2802. Official messengers. NT 2 youths

about 21 selected by chief, when inviting other villages; carried short piece of cane (not cross) with tobacco inside (2264), plugged with chewed mescal. Given to village chief, who informed people of invitation for 2 days hence. ST young men. SC informed invited guests of meeting, etc. Chief selected messengers for occasion. No permanent office. Ci sent by chief to invite people to discuss war plans. Hu delivered chief's message to other camps. KP smoke keeper's assistant called katyokch<sup>1</sup> (his legs), patrilineal hereditary officer, went to different villages with messages.

#### CLAN ORGANIZATION

2803-2820. W Apache clans matrilineal like Pueblo, Navaho, and SE Yavapai, named principally for localities like Navaho and SE Yavapai, but partly totemic like Pueblo. See note 2779 concerning W Apache clan chiefs.

NT clan, hadate. In Fossil Creek band some different clans on Fossil cr. than in Strawberry v., thus indicating localization. Principal clan of Strawberry v. yakohikain, white-spot-place people. 4 other clans, represented there by married-in people: (1) kesiyenadenhayi, walnut-tree-place people. Named for spot in Strawberry v. where they stopped; (2) totagê, between-2-creeks people; (3) nagosukê, making irregular marks on ground; (4) betketin, place below power house on Fossil cr. Informant's father from last; mother and himself yakohikain. Members of linked clans intermarried; marriage into father's clan allowed but not to close relative.

ST partial list: (1) clan of informant, totem oriole; (2) totem black bear. Persons not named after clan or clan animal. Mythologically, totems became people or associated with people. Clan to which eagle related alone had right to wear eagle feathers. Bear clansmen reputed able to wrestle with bears. According to Goodwin, 3 phratries of 3 clans each; also linked clans, i.e., clan in one phratry had special relation to clan in another phratry. Marriage into father's clan permitted, if no close blood relationship. ST chiefs transmitted office to sister's son or brother; fitness counted. New chief moved to dead chief's seat. Clan chief, old man with biggest following, did not necessarily reside at matrilocal center of clan, i.e., community where clan females most numerous. Head chief and subchiefs of clans related as brothers or male maternal parallel cousins. Thus, two chief ideas: local and clan. A man might reside under local chief (who might be local clan chief) and have his own clan chief elsewhere. Sometimes community composed of 2 clans which intermarried largely; then two chiefs, one of each clan. Example of chief and subchiefs in 1st (i.e., informant's) clan: (1) head chief, under whom informant lived; (2) subchief, lived at Pleasant valley (SE edge of territory of semi-band 6); (3) subchief, lived with head chief. These 3 chiefs maternal 1st parallel cousins.

SC clan, hawotele. Not localized. (1) hakaye, held territory around Wheatfield, Hayden, and Mescal mt.; (2) deschin (red); (3) chechidiskayin (white rock); (4) chideskidin (rock sticking out); (5) chepinastiye (rocks all around); (6) kaisemutedin (willow mesa); (7) kanaskiden (washing themselves); (8) bisitenaye (bluff point); (9) tustuwe (insects on water); (10) besün (yellow). Totems: 2, red bird, perhaps tanager; 3, goldfinch; 10, yellow bird, for which clan named; not killed by totemites. Marriage into father's clan if no close relationship; could not marry cross cousins. Kinship terms to clansmen and clanswomen, all regarded as relatives, even though not. Fellow clansman from another land called by kinship term. Thus, informant would call besün man from WM, Ci, or Navaho his brother, if about his age. Ci equivalent of besün, kistente clan. Navaho equivalent, tungin-bebetoten clan. Same extension of kinship terms for father's clan mates as for mother's. Besides head chief of clan, apparently subchiefs in each local representation of clan where sufficiently numerous. This statement in response to query as to how there could be clan chief when clan scattered. Both head chief and subchiefs called nandün.

Ci clan, hadjitii, applied to clans and subclans. (1) dischin (red hill point); (2) diskaden (cottonwood sprouts in cluster); (3) nakodischizen (2 hills with canyon between); (4) nazochin (descendants of Mexican woman captive); (5) shachin (red cliff); (6) dushtuwe; (7) kistente. (Mexicans nakaye, Americans ida.) Clans 1 to 5 did not intermarry, as 2 to 5 derivatives of 1, groups that separated from 1 and went elsewhere to plant their crops. Except for 4, named for places in which planted. They constituted subclans, and were under dischin clan chief. In old times Ci chiefs of dischin and dushtuwe clans. Kistente clan has chief now, but perhaps not formerly. Tokdukain clan of Carrizo Creek band had own chief. Clan with few members often had no chief; lived under chiefs of larger clans. Marriage into father's clan allowed if no close blood relationship. Marriage into mother's clan forbidden, crucifixion of contractants by tying to limbs of tree to die. Informant and interpreter of dischin clan; informant's father's clan dushtuwe. No regular reciprocal clan functions, although members of one might assist at funeral of member of another clan. Fellow clansmen addressed by relationship terms; others usually by word "friend," or sometimes "brother" which at times extended to Navaho. Only Ci clan with animal association was nakodischizen; bear totem from following event: hunter coming home at night, went into bear's den, stayed 4 months. They fed him piñon, acorns, etc. He told about it upon return. Nakodischizen people reputed to have big feet like bear.

WM clan, hadjiti'i. (1) nakwideschiden; (2) tudisise (water black, in reference to Black r., informant's father's clan); (3) nadochotin (little mt., a hill near Bonita creek); inform-

ant's clan; (4) bistaha (deep wash); (5) takain (water shining on flat surface); (6) iya'haye (iya'hai bushes growing there); (7) tenedozhade (little hills on edge of river); (8) setean (rocky point in river). Ci kistente clan (SC besūn) not represented. Clan 4 called bistaha because farmed at that place. Clan 3 offshoot of clan 4. Helped one another in trouble, e.g., funeral; could not intermarry. Totem of clan 4 road runner, not killed; quarreled with any clan which killed this bird. Long ago road runners people and bistaha clanfolk their descendants. If see anyone with road-runner feather on hat, take it away from him. Clan 3 had farms around little mt. for which named nadochotin. Clans 5-8 do not intermarry as related; 5, 7, and 8 being offshoots of 6. All 4 have hawks and eagles for totems. Farms of clan 6 (iya'haye) 2 mi. S of modern Ft. Apache. Marriage into father's clan allowed if contractants not closely related. Breach of exogamy rule for mother's clan punished with crucifixion. WM and Ci would kill anyone who tried to rescue crucified victims. Sibling and cousin terms to unrelated clansmen of about same age. Clan chiefs hereditary. 4 in 1935: Informant Charlie Shipp succeeded his "mother's cousin," as nadochotin chief; Ba'as, iya'haye chief on North Fork of White river; Haschibasdaszi (brave man stands to fight) iya'haye chief at White River village near Ft. Apache; Nataischi', bistaha chief. In olden times, clan chief at each place where sufficient number of clansmen. Now chiefs of nadochotin, iya'haye, and bistaha clans all reside in modern village near Ft. Apache. If 3 such chiefs in olden settlement would consult as to communal enterprises.

Of clanless Apache groups, following noted: Me no subdivisions of Ni'ahane band; band members intermarried as long as blood relationship did not prohibit. Li man of Tuensane band could marry Tuensane woman if not related. Although people referred to by places they lived in or came from, these names did not persist generation after generation, so no one knew whence ancestors came. So apparently, not even an approach to localized clans of W Apache. Ol all called by relationship terms even if no relationship traceable. Ol would call Ll man, to whom no relationship traceable, "friend."

SU Wemenuis called one another by kinship terms even if not related; practice extended to individuals of Pota and Muwachi bands. Zu interpreter, her mother, her son, of Badger clan; interpreter's husband of Sun clan. SA 2 informants respectively of Pine and House rat clans, clans of their mothers. SI informant and wife both Sun clan people. At SI exogamy not mandatory. Clans matrilineal. Others mentioned were turquoise, oak, red bead, grass, shrub or brush. For Papago clans see note 2821.

2821-2826. Moieties. Annual relay race of Ll and Ol suggests they are moieties of single political entity, but no other evidence to support such view. 2 distinct political entities origi-

nally. Marriage rules to support moiety view lacking. Formerly married mostly within their respective groups. Enforced contiguity of reservation life now increasing mixed marriages.

Aside from Winter and Summer ceremonial moieties at SI, only groups with moieties were KP, HP. KP informant called moieties red and white and named "fox" as totem of first, turkey vulture of second. When dead totem animal found by totemites, it was buried. Clans comprising moieties created together in Underworld before Emergence. Clans thought to have been once exogamous, but not moieties. Interpreter and wife of one clan. Clan mate of either sex called niyaisu. Red clan father names, okol, apap, apuki; white clan father names maam, vaaf. Ending -kam added, as apkikam (apuki plus kam), refers to clan as whole.

HP informant named 4 clans by terms used for father in each: apap, okol, maam, vaaf. First constituted white or coyote moiety, other 3 red or turkey vulture moiety, thus reversing KP color designations. This contradictory information characterizes other records too (Gifford, 1918, pp. 174-177). If coyote totemites found dead one, clothed it like man and buried it, making speech about misfortune that coyote died. If dead turkey vulture found, totemites dressed it like woman and buried it.

#### KINSHIP SYSTEMS

To avoid expenditure of time in getting full kinship systems, after consultation with R. H. Lowie 8 features (2827-2834) were selected as diagnostic of types of kinship systems. Terms embodying these 8 features were obtained from informants, and the + and - entered later in the list; informants were not asked the abstract questions. Element-list entries reveal 5 W Apache groups distinctive in special cross-cousin terms (2833); Li, Ll, Ol differ from other Apache group in having only 2 grandparent terms, trait shared with SU. Ll, Ol systems distinctive in merging father's brother with father, mother's sister with mother, not shared with Li, SU. SU, KP differ from others in having relative age terms for father's brothers and mother's sisters. W Apache systems have 4 terms for grandparents (details beyond), except ST 3 fide Goodwin. Element-list entries for ST on basis of Goodwin's knowledge of system. Informant's statement that Ll terms identical with Ol accepted, terms not recorded. Terms for other ll groups recorded.

No inquiry about self-reciprocity, thus important feature of Opler's (1936, 625) Chiricahua type overlooked, except for WM where volunteered. Also Ol informant evidently erred when denied special cross-cousin terms Opler cites (1936, 627). WS and Hu are Opler's Chiricahua.

SU data recorded indicate system of Spier's (1925, 76) Mackenzie Basin rather than Yuman type where he places SU system he examined. I

think this likely due to Ll, Ol influence. Findings based on limited data largely coincide, as they concern Athabascan groups, with classificatory conclusions reached by Opler with full data (1936). For instance, linkage of Li with Jicarilla rather than with Me borne out.

Parents. Father: SC chita; Ci shita; WM shika'; WS shita'a; Hu shita; Me chistade; Li chiashe; Ol shika'e; SU muwau; KP nio. Mother: Ci, WM, WS, Hu, Ol shima; Me, Li chima; SU beiyau. WM shika', Li chima, Ol shima differ from stems recorded by Opler (pp. 624, 625).

Uncles and aunts. Father's brother: SC chikihu'; Ci shibede; WM shipeze, self-reciprocal; WS, Hu shitede; Me chipeche; Li chipeche, or chiashe staye, little father; Ol skika'e; SU pavichiu, father's older brother; SU kaichiu, father's younger brother; KP hai, father's younger brother. Father's sister: NT chipe; Ci shipedje; WS shistede; Hu shitede; SU patsiu. Mother's brother: NT chista'a; SC chibese; Ci shitaa; WM shita'a; WS shitai; Hu shistaye; SU tinachiu. Mother's sister: Ci shikaa; WM shila; WS shika'a; Hu shikaie; Me chika'e; Li chika or chima; Ol shima; SU mother's older sister pachichiu; SU mother's younger sister namatsiu.

Siblings. Like sex: WS sikasa; Hu shik'es; Me chikese; Li chikes; Ol shichuni. Unlike sex: WS shizahai; Hu chisla; Me chislahe; Li chisla; Ol shila. Younger sibling: Li chista. Older sister: Li chisbate. Older brother: Li chima'a. Older sibling of like sex: Ol shiya'a. Younger sibling of like sex: Ol shiza.

Special cross-cousin terms. Male cross cousin: NT chisna'a; Ci shizeye; WM shiwa'as. Female cross cousin: NT chizede; Ci shizeye; WM shizede.

Grandparents. Father's father: NT shimille; SC chinulle; Ci shitale; WM shindale, all grandparent terms self-reciprocal; WS shidale; Hu shistale; Me chindale; KP niwok. Father's mother: NT shinê; SC chichiné; Ci, WM shichine; WS shikine; Hu shistine; Me chiskine; KP niska. Mother's father: NT shidjokiye; ST shicho; SC chicho; Ci, WM shicho; WS shichoye; Hu shistoye; Me chissuye; KP nita. Mother's mother: NT shiuye; SC chiwuye; Ci, WM shiwuye; WS shicho; Hu shischu; Me chischu; KP nihok. Grandfather: Li chisayis, Ol shisoye; SU towutsi. Grandmother: Li chischu; Ol shicho; SU kauwuchim.

#### RELIGION

At this point it should be reiterated that no attempt was made to record Navaho or Pueblo religion.

2835-2851. Curing shamans. Number of nights shaman sang for patient. Ci, WM, SU 1; WS, Hu, Me 4; Ol 1-4; KP no fixed number.

NT rattlesnake doctor made 4 piles of earth representing mts. (unnamed) around patient. Shaman kicked away E, S, W, N piles. Turned over sick man, sang over him. No suction. Well in

hour or so. No swelling. Sun did not help. No "milk" from victim's mouth. 1 buckskin payment. ST sucked out "shiny little rock," displayed it, raised hand, said some holy words, it disappeared. After pressing both hands on patient, blew sickness from hands to E, S, W, N. SC shamans consulted over difficult case, but apparently no regular diagnostician. Rattlesnake bite cured by regular shaman; sang, used pollen. Cost about \$30, paid in horses, buckskins, etc., formerly. Sickness might cost much more. Rattlesnake shaman sometimes handled big rattlesnake. Ci shaman, digin; rattlesnake shaman, k'i digin. Illness diagnosed by revelation while singing; no dream or trance. Patient brushed with 2 eagle feathers; blown on, but no saliva. Rattlesnake bite cured with pollen circle around bite. Rattlesnake shaman did not handle snakes. Customary pay turquoise piece from ruin and 1 eagle feather, presented when services sought. WM shaman, digin; no special diagnostician. Some boys got lump in throat from lizard killing. Cured by laying on hand. Also sick if put foot on snake. Cured by singing. Someone drummed while shaman sang; others sang too. Pollen on bitten limb to prevent poison spreading, like ligature. Shaman did not pray to sun. Informant knew of 2 shamans who doctored with rattlesnakes. Held snake by neck and body, motioned over sick man, from left groin to right shoulder, from right groin to left shoulder, not touching with snake. Payment in advance: turquoise with eagle feathers put on shaman's foot; also sent buckskin.

WS curing shaman, dizhe<sup>n</sup>; rattlesnake shaman, gudizhe<sup>n</sup>. Prayed, beat drum, sang with eyes closed for vision as to trouble. Might have difficulty extracting; by suction or singing. Sucked out sharp-pointed bone, etc. Song and prayer drove disease away. Sometimes herbs to drink or rub on. Brushed with eagle feathers. Might seize disease by pinching patient's body, then blow away. Pressure on head and blowing from hands dispelled "evil" sickness. Sun, moon, stars in curing songs. Sometimes 3 shamans on 1 patient: 1 sang and prayed; 2 ditto, gave herbs; 3 sang and sucked out "poison arrow." Turquoise and pollen on shaman's foot for pay in advance; might return if patient died. Rattlesnake shaman prayed Nayitizone, sang, medicine on wound. Buckskin with turquoise pendant tied around limb above or below loosely, pollen around bite. No suction, as would spoil gums and teeth. Not every shaman cured snake bite. Hu diagnosing shaman thought not cure, recommended another. Sucked out witch's "poison arrow," brushed with eagle feathers, pressed seat of pain, lifted hands, blew sickness from feathers. Also massage with hands alone. Shaman "saw with mind" while singing with closed eyes; no dreaming. Pollen around snake bite, buckskin with turquoise tied on wrist. Snake songs and prayers. Rattlesnake helper. No suction. Gave shaman rolled cigarette, turquoise, when requesting treatment. If patient

died, shaman returned some property to relatives, because "sorry for them"; kept turquoise.

Me causes of sickness besides "poison arrow": bear, hawk, snake, coyote, wolf, sickness in children through nightmare; ghost in dream. Shaman rolled cigarette, smoked, prayed, to determine whether to treat. Some shamans prayed and sang, others sang only. Cured by striking wound or pinching out bullet or point. Suction with mouth, cane tube, elder tube; medicine in tube. Brushed with eagle feathers. Did not reveal dreams about patient, lest blamed if death. Payment in advance black-tipped eagle tail feather and cigarette. If cure, sometimes further payment; turquoise if shaman asked. Turquoise, pollen, to snake specialist; other gifts after cure. Prayed, used sand painting, pollen on victim, but not where struck. Sang 12 songs. Snake spirit, not sun, helper. Li curing shamans denied, but old men and old women herbalists; bleeding for headache. Tuetenene (group intermediate between Me and Li) had curing shamans. Li no sickness from dreams; "no one bitten by rattlesnake"! Shamans for deer hunt, taming and curing horses, curing lightning sickness.

L1 informant "never doctored by shaman." Medicine rubbed on with hands, in daytime; 3 or 4 days' treatment. Cause of sickness: "contracting colds, wet clothes, hot and cold places." Shaman smoked, prayed to Sun before treating. Rattlesnake bite by any shaman: cut, bled, herb applied. No eagle feather or turquoise sent in calling shaman. Payment of moccasins, buckskins, etc., after treatment; returned if patient died. O1 sickness by catching "disease" like whites, or suffering injury. Denied soul theft, possession, "poisoning." Admitted causes given by Goddard, p. 181, viz., crossing bear's or rattlesnake's track. Pressing for soreness, as of chest, by anyone. Herbs for rattlesnake bite by specialist; no pollen or sand painting. Shaman used eagle feathers with turquoise attached. Shaman called by messenger with eagle feather. Buckskin paid for cure. Sometimes ceased to be shaman because power departed. Informant had tried in vain to be shaman.

SU smoked before sucking out blood, wormlike object. Sucked no stone or feather. Anyone might press for pain, then blow sickness from hands. Buckskin in advance as full payment. Rattlesnake shaman sucked out rattlesnake tooth. Did not handle snakes.

Zu snake society for curing. Kroeber, Zuni Kin and Clan, p. 160, mentions possibility that the first syllable of the name of Chikkyalikwe society refers to rattlesnake. In conversation, Dr. Kroeber tells me he knows of no forthright identification of any Zuni society as snake society. See Stevenson, The Zuni Indians, p. 528, for traditional origin of rattlesnake fraternity. Very sick person turned over by society to doctor; if recovered, initiated into society after year.

KP shaman, makai; plural, mamake. Witchcraft by shamans only. Hard substance in victim's body

sucked out, victim recovered; soft substance could not be extracted and victim might die. (Case in 1933 of court interpreter "poisoned" by Yuma shaman.) Shaman might say ghost took soul of patient, who would die as no way to recover. Seeing ghost also caused illness. In diagnosing, shaman sang beside patient with eyes shut. Determined if bear, rattlesnake, turtle, etc., caused illness. Patient recalled what done to offend animal. Someone who knew songs of animal made wooden image of animal to press on body. If ineffective, another shaman called. Sometimes shaman spent 1 night on diagnosis only. Might prescribe herbs or rubbing with hands. Usually payment left to generosity of patient. None in advance. 1 buckskin or 1 cotton cloth for course of treatment, cured or not. Rattlesnake shaman, who had been bitten by rattlesnake and dreamed rattlesnake sucked his bite, sucked wound and extracted blood. No teeth sucked out. Sun did not help. Ashes and saliva marked in ring around limb above wound. No ligature, but such for sore arm or leg (yucca fiber used). No pay for rattlesnake cure. HP after sucking patient, shaman softened cattail stem with fingers, thrust far down own throat, vomited.

2842. Apparently WS assuaged deity, not animal, by ceremony.

2852-2855. Weather shamans. Note 2713. SC rain shaman sang, people danced all night. No special costumes. Shaman had perforated turquoise with feather through hole; put on right foot with tule pollen. Ci shaman made rain for maize. WM shaman made rain by singing. In fall of 1934 WM shaman made rain at San Carlos for \$150. WS rain shaman, toye dizhe<sup>n</sup>, made or stopped rain; wind shaman stopped rain. Me told of Tuetenene shaman who caused rain to quench thirst of 15-year-old boy who lay in dry arroyo. KP to make rain called wind with bull-roarer. Sometimes evil shaman stopped rain; one stopped rain for 5 years by putting water in glass bottle plugged with end of "rainbow." Finally, when with group of shamans trying for rain for 5 years, he told them to uncork bottle and pour out water. Rain fell that night.

2856. Shamans of werewolf type. Me could become bears or coyotes. KP man getting water went toward wolf cry. Tracked wolf next day. Returned with blood on hands. Could change into wolf at will. Man attacked by she-bear with 2 cubs received power to throw his shirt so became bear; also power to change into bear.

2858. Diviners. SC predictions by all shamans. Ci some had power to foretell. WS could foretell whether year to be good or bad. Hu sometimes told of enemy approaching, but changed enemy into bear, etc. HP at saguaro-wine ceremony 4 diviners; one dean with whom others agreed; see note 2945.

2859-2875. Acquisition of shamanistic power. Note 2856. Time of life: SC 25; Ci 16; WM 13-15; WS 15; Hu 10; Me 18; Li 20 sometimes; Ll, O1 midlife; SU 25; KP 15.

EN shaman's daughter to become shaman "studied"

20 years; learned flute playing. SC power from Changing Woman. Note 2904. Ci sometimes young man learned secretly from shaman father, no dream necessary. Istlenatchehe and her son Nayitizone were shamans' spirits. WM boy at 13-15 said: "I think I'm going to be shaman." He predicted something, lost interest in food. God Nayitizone, shaman's spirit. Chubûtichine, younger brother of Nayitizone, turned into white man.

WS Nayitizone gave shaman's power, prayed to for deer-hunt luck. Tuvachitine, "water child," daughter of goddess Istenatleche and sister of Nayitizone. Istenatleche's husband was Black Thunder (Isdededischis); rain his semen. Impending shaman dreamed of above-cloud deity (preceding deities), or mt. deity, or sazada (W Apache gan spirit). Heard songs and drum in dream. Went into wilderness, on mt. top, to hear songs, get vision, etc. Dendjun, right-hand spirit, good. Ishku (ugly), left-hand spirit, bad. These 2 strived for control of individual. If latter won, only recourse was to pray to Nayitizone or his mother, who guarded people. They also punished by letting one fall into hands of evil spirit, i.e., have bad luck. This offset by prayer and ceremony with sazada (masked gan spirit impersonators, 2893). Chidne, evil spirit living in underworld. In some cases shamanism transmitted to relative.

Hu training began at age 10, by father or other shaman. Novice might have vision and hear voice of gan spirit or clown spirit while sitting on hilltop near camp. Mts. did not help as such, but gan and clown dwelt there. Sometimes these came to help shaman cure (i.e., as masked impersonators, 2893). Any of 4 deities helped shaman also: Tuvachitine (water baby), male; Istlenatche, his mother; Isdidedische (black thunder), his father; Chigonoaiye (sun). Tuvachitine was Nayitizone of other Apache. These 4 did not cause illness. Ghost in possession of patient's body driven out by male or female shaman singing, fumigating patient with sage, and causing him to vomit.

Me 2 methods: seeking, learning from older shaman. In former, ga<sup>he</sup> (W Apache gan spirit) helped. Nayiizone, also shaman's guardian spirit, taught song and prayer. When seeking, 4 days without food or water. Spirit talked to novice while lay on rock or mt. top; vision there. Novice might learn from old shaman, not parent or close relative, 4 nights at time. Paid 1 horse for instruction. Young shaman wore 3 or 4 Haliotis pendants in hair. Li vision seeking would shorten one's life. Shaman purchased power and training from older shaman. Nayiizone, shaman's guardian spirit.

Ll anyone might ask mts. or sun for help. Yidaiyezone, culture hero (sun, his father), probably shaman's helper. Ol when people emerged from Underworld, Yidayesguni not yet born. When monsters killing people, he became known. His mother was "Jicarilla." Flood before emergence, so this woman had nothing to do with it. No pray-

ers to mother, only to Yidayesguni. SU novice fell in trance, bled from nose, heard songs, had vision.

KP shaman novice usually started about 15, but some years before practicing. Met animal helper who instructed, but told him to defer making known. Must not consort with menstruant, lest never become shaman. Older shamans knew of novice's experiences, but not other people. They did not train or help. Sometimes supernatural power (chikaga) transferred from shaman to son, secretly in wilderness. Father gave only part of power. Power from bear, mt. lion, rattlesnake, fox, for good or evil. One mt. (Vapekek, near Santa Cruz village in Sonora) was shaman's helper, appeared as spirit. Dead conjured outdoors at night to inquire about sickness or epidemic, not public ceremony. Sometimes ghost asked for cigarette, which smoked.

2876, 2877. Use of jimsonweed. NT group of youths pounded jimsonweed root on stone, drank boiled decoction; no shaman in charge. "Crazed" for 4 days: bushes looked like men. Went in water. When sitting up, smoothed ground with hands. Called stick snake. Called stone bird, etc. Never fell down even though crazed. WS kenakotiyahé, not used. Zu note 2718; jimsonweed personified or deified as 2 youths, who could conduct person to place of robbery and show thief; accomplished by priest administering root decoction to healthy youth who revealed thief to priest. Youth's system freed of drug by draughts of hot water and vomiting.

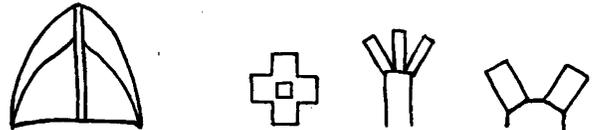
2878, 2879. Women shamans. NT knew better than male when patient to die. Me taught by old one, or heard voice while gathering; received medicine, which impermanent, as power gone in few years.

2880, 2881. Shamans killed. WS person sometimes shot by malicious shaman with poison arrow, because refused to give horse, etc. Only doctor saw in body, sucked out, showed patient. Doctor might indicate wizard, who was seized, hung by wrists until confessed. If no confession, fire under him and burned alive. If confessed, his relatives called and discussed with captors what to do. If promised to be good, released. If recurrence, killed without council. Sometimes bad shaman hung up, medicine and equipment burned, then released; or brought before chief by victim's relatives. Chief said: "Bring him here. I want to say some words to him. If he will throw away his medicine, we may let him go. If not, we shall kill him." Chief and council listened to him and to accusing shaman. Chief asked why "poisoning" young people. Denied. Chief said: "Shaman here says you did it." Shaman again declared accused was "poisoner." Chief threatened crucifixion if accused did not give up practices. Accused then might admit it, begging mercy. Chief ordered fire built in which accused burned all equipment, and promised to be good. If denied guilt hung up by wrists, fire built under him.

2882-2892. Witchcraft. Note 2880. SC informant said "all Pinal band witches went to Tucson and settled"; Apache Mansos? Ci witch, ilgus. WM witchcraft, but following denied: shooting or touching victim; using hair or nail parings; stabbing effigy of person. Witch taken to woods at night by group of men; hanged by wrists, left to die; or stoned to death. Witch of either sex. WS note 2880. Poison used by shaman like urging dog on person; shaman might cause bear, wolf, etc., to kill victim. Father's brother's daughter of informant (then ca. 12) moving camp. Girl and grandmother walking behind. Girl disappeared. People camped. Everybody looked for her. Far back tracked her to heavy timber, where footprints. Right there antelope tracks in adjacent open place. In center her tracks. Returned to camp. Went to shaman who knew about antelope. He smoked, prayed, sang with eyes closed, saw vision of girl making bed with antelope. Made sazada (gan spirit) ceremony with clown to get her back, but no success. Thought she became antelope. Hu witch made person sick with "poison arrow." Shaman was witch detector. If witch gave up "poison" and burned it in fire publicly, he was spared. If not, hung up and fire built beneath, with chief's approval. Witch male or female, but old. Wild animals, or even flies, were witch's helpers: mt. lion, bear, wolf, eagle, snake, etc. They also help curing shaman when sickness caused by one of them. Eagle caused illness if carried witch doctor's poison arrow. Sickness caused by bear cured by bear ceremony performed by shaman over patient in presence of family, but not public. Me witchcraft from appearance of Indians on earth. Sometimes 2 or 3 shamans connived to cause death. Good power and wicked power in world; witches have latter. Witch's relatives died sooner or later, too. Witchcraft invoked so Mexican or other enemy would kill person. Instance of wizard's own medicine killing him because continued to use after medicine told him to desist. Witches (evil shamans) caused illness by "poison arrows" shot into victim. Dangerous to curing shaman to extract. Bone "arrow" sucked out, displayed to patient, burned; wizard named who shot victim, perhaps because victim refused him something. Shaman sometimes accused person of causing illness in order to encompass his death. If person made threat or prophesied injury which came to pass, was regarded as witch. Zu witch tried. Hung up by hands tied behind back if did not talk. War leaders executed by clubbing, sometimes by crucifixion, i.e., hung by wrists tied behind until dead. KP women shamans at times "poisoners." Wolf or fox witch's helper. 2d shaman treating patient might accuse 1st of causing patient's death. Relatives might kill 1st, after complaining to smoke keeper who warned shaman. If 2 or 3 more cases then certainly killed. Council and smoke keeper might decide shaman be killed from ambush if nefarious practices over years.

2893. Masked performers helped shaman cure. Also SE Yavapai (Gifford, 1932, p. 236). SC masked dance cult began at Wheatfield near Miami,

center for masked dances. Gan and clown spirits impersonated. If saw real gan got sick; hence never called name of gan. I saw night gan dance, August, 1935, to aid shaman Fattie cure his wife. Bodies of 4 gans black. Feather curtain over face, hanging from black mask over eyes, imitation eyes sewed to mask. Flour-sack kilts. Belts with bells. Moccasins with turned-up toes. Shaman was Pinal man of hakaye clan who had paid older shaman for instruction about costumes. 3 times we saw dancers, but left before 4th entry. 1st and 3d treated sick woman by each dancing around her, touching her shoulders and head with tule pollen and brushing eagle feathers upward in front of her face. White bedaubed clown with shorts and tight-fitting hood of gray material with 15-in. cross on top of it; black design of 2 interlocking crescents representing whirlwind on back and chest; carried bull-roarer and 2 or 3 eagle feathers on cord. Each gan dancer had wooden cross on each upper arm, juniper foliage on belt and arms; for wooden head tablets worn see figure and note 2967. Sick woman



brought out of tent and seated on blanket. Returned to tent after each treatment. In 2d and 3d performances 4 girls got up and danced behind 4 gans, and 2 danced with clown. In 2d performance after girls quit, 2 or 3 small boys seized and forced to dance with gans. Women who danced not necessarily relatives of sick woman. Any woman who wished to dance with gan might do so. Dance in clear space; no fence. Ci masked impersonators of gan spirits 1 night only for sick person; clown preceded gan spirits, whirled bull-roarer to announce coming (also SC). Shaman did not use. WS corral with entrance E. Shaman and singers sat at rear opposite entrance, fire in center, 4 young conifers (fir, juniper, or piñon) set up within at cardinal points. Patient sat on E side of E tree; after 1 song moved to S side of S tree, then W, N. 4 masked dancers representing gan spirits (sazada) and 1 clown treated him at each station. Hu openings in corral for curing at 4 cardinal directions (821); masked dancers and clown. Other dances in open space without fence (802). Ol curing with dancers, apparently not masked. KP corral (2910) for purifying sick person, masked purifiers in serious cases.

2894-2910. Shaman's equipment:

2896. Rattle. Hu deer-hoof rattle in girl's puberty ceremony. Me deer's ears rattle for curing. KP gourd rattle containing pebbles from ant hill, in shaman's right hand; feathers in left.

2897. Bull-roarer. NT, ST note 2215. SU non-curing shamans used.

2899. Wooden cross. WS laid on seat of pain, e.g., headache. Hu from lightning-struck tree

toward sunrise place, to touch sick person and blow disease from; mostly for persons ill from fright caused by lightning striking tree; note 2928.

2900. Turquoise. Ll laid on seat of pain.

2901. Eagle feathers on cord. WM to touch or brush sick person. Ol for brushing. KP 2 longest eagle feathers tied parallel at base. No string to carry suspended. Brushing patient to "loosen" body to release "poison." Sometimes rubbed patient with saliva on fingers. No blowing frothy saliva.

2902. Cane or wooden tube for suction. Me either material. KP cane as precaution if patient victim of witch, as extracted object might stick in shaman's throat if sucked with lips.

2903. Bundle of amulets. Me lacked, supposed to have "medicine" inside himself. KP amulets in buckskin sack: medicine bundles of herbs, quartz crystals, tobacco.

2904. Special costume. SC, Hu painted buckskin shirts; "power from painted figures"; used pottery drum when wearing. SC painted buckskin cap with eagle feathers.

2906. Pollen in curing. NT as medicine, not pigment. ST cattail pollen. WM on patient's shoulders, chest, back. Hu pinch of pollen sometimes on tongue of sick person. Ll on seat of pain. SI maize pollen in water given patient to drink.

2907. Tobacco. Ci, WM smoked before singing for patient; blew smoke in air once, prayed for recovery; no special pipe. WS smoked pipe or cigarette before singing. Hu smoked cigarette before curing. Me note 2835. Ll smoked pipe before treating; prayed to sun; no song. SU smoked before sucking. KP fox tobacco (note 2166) smoked by shaman in cigarette of corn husk, of hollowed stem, or of cane. Smoke blown on patient, from different directions.

2908. Sand painting in curing. KP called "wind painting," made by other than shaman, to purify one ill from wind sickness. Shaman diagnosed, left cure to 3 or 4 persons who made painting. Songs of wind cycle (2930) sung by them; not regarded as shamans (mamake). Painting outdoors probably rectangular, not square; some distance from village, not public. Colors black, white, red, blue, yellow, unconnected with directions. Patient there. Painters scourged selves with brush for purification. Ditto any spectator who happened by. Otherwise got wind sickness themselves.

2909. Gila monster, etc., in curing. SC tail cut off, used by shaman. WS to stop epidemic of colds ate mt.-lion meat, because "mt. lions never sick." Brush bed for cooked meat; cut up, passed around. Shaman prayed with pollen, making crosses in 4 directions over meat, to 4 deities: Istenatleche, Nayitizone, Tuwachitine, Isdededischis. Not certain if these 4 deities lived in or connected with specific directions. Me heated penis bone of bear, between teeth for toothache cure, sometimes yellow pollen on bone. KP sickness

caused by Gila monster cured with wooden figure of reptile by one who sang Gila monster song cycle. Tortoise or turtle shell pressed on sick person in singing. No turtles in KP country, but sometimes shell by trade.

2910. Corral for treating or purifying sick. (See note 2983.)

2911-2915. Shaman's public performances. SC thrust eagle feather down throat, so only base protruding. Me swallowed eagle feather or handkerchief, then brought up; live coals picked up with eagle feathers and swallowed. KP ventriloquism in representing ghosts' voices.

2916, 2917. Use of herbs, etc., in curing. (Cf. notes 2906, 2909.) NT anyone used. Sourberry juice for insect bites. For difficult urination, tortoise shell burned, ashes rubbed on belly over bladder; "effective at once." WS, Me Opuntia-leaf plaster. Spines singed off, leaf split in half, over bad open sore or swelling. Replaced frequently. Me used in same way foot-high cylindrical cactus. Me jelly from wounded deer's eyes, rubbed on warts, not washed off for 4 days. Li payment for herbalist treatment buckskin, buffalo robe, etc. SU no herbs in curing.

2918, 2919. Bleeding and ligatures. WS ligature preliminary to bleeding; same treatment for horses. SU temples bled if chronic headache; also W Mono practice. KP bled for paralysis, rheumatism, etc., by anyone who knew how, not by shaman.

2920-2929. Charms and amulets. SC Pinal mt. woman seen wearing eagle feather through perforated turquoise on buckskin cord around neck. Me women wore medicine necklace with turquoise and eagle feather attached; medicine root in bundle at bottom of necklace; root grows S of Alamo-gordo; only wounded person could dig it. Men wore similar charm of root, turquoise, and eagle feather in form of bandoleer. Songs about this medicine necklace or bandoleer. Story of discovery of efficacy of root: Spaniards attacked Me camp early morning. Man wounded in breast about midday, but kept fighting. Finally fell down, blood running from mouth. Fell on medicine plant. About sundown he heard voice telling him to get up: "You've been lying on me long enough." He opened eyes and crawled away. Plant said to wounded man: "Dig me out. Get my root. Chew and swallow 4 times." Then plant sang and man learned song, then many more songs. He got well. People have had that medicine since. Li wooden cross worn by children for good luck, from Mexicans. Ll, Ol eagle feather in hair, not charm, only ornament. Warriors on warpath expected to die, so no charms worn to protect. KP eagle feather on necklace; no turquoise.

2923. Beads as charms. WM turquoise for good luck. Me shell, turquoise, black, red beads, for deer-hunt success. Unsuccessful hunter asked shaman to influence ga<sup>n</sup>he spirits in his favor. Li 1 white shell bead as part of hunter's amulet bracelet. Ll Mexican red glass bead, white bead, turquoise, and Haliotis as charm on tunic by either sex.

2924-2927. Claw charms. WN hunter carried bear or "tiger" claw, sometimes on gun. EN wildcat, eagle, bear, deer dewclaws used by shaman when singing. WM bear-claw pendant for boy or girl, to keep disease away. Ditto 2 eagle claws. Me warrior wore mt.-lion claw on shield; bear claw, eagle claw on buckskin string around neck. Wa 1 mt.-lion claw tied on end of killer's bow. Others to companions.

2928. Arrow point as charm. Hu shaman sometimes stone arrowhead pendant on necklace. For curing lightning sickness, with or without cross, note 2899.

2929. Fetish bundle. (See notes 2903, 2945.)

2930. Song cycles. ST notes 2430, 2461. KP Gila monster (2909), turtle, rattlesnake, wind (2908), eagle, hawk, war, salt, bear, death, saguaro, 1st menses. Lacking: Goose, travel, season cycles of S Californian groups. Composers of songs in different villages. Each village sang own songs. Sometimes from spirits. Sung any place or time. Done so different villages could see one another's dances and hear their songs. Women and boys danced, not more than 10 of each sex. Annual, social, not religious. HP salt, rabbit, deer, etc. Shaman saw and learned songs in dreams.

2931-2953. Some ceremonies. After Ll, Ol left Me reservation they practiced some Me ceremonies, but soon abandoned them. Ceremonial center for KP was Santa Rosa valley; for HP Kaka. Principal Papago ceremonies: (1) hasenyiltuta (saguaro singing), in midspring; (2) rain ceremony, when saguaro ripe, ca. July; onawakoichukchi (wine to bring the rain); (3) Vigita, every 4 years at Santa Rosa only (Nov. 1936). (1) and (2) annually anywhere.

2931. First-fruits observances. Me for all kinds of wild plant foods. Prepared food, sprinkled pollen on it; thanked Nayi'izone for it. All assembled for this. Prayed for plenty in subsequent years. Not bad if someone ate before ceremony. Old men and women arranged. Same for cultivated foods. No pressing of eaters. KP 1st of each cultivated crop to shaman, who told person when family might begin eating, perhaps in day or so. Shaman blew tobacco over product. Not village ceremony, but family affair. When harvesting, shaman presented with basket of produce, pumpkin, or melon.

2932. Harvest ceremony. See note 2944.

2933. Ceremonies in which masks worn. WS said Bourke's (see his pl. 5) "Apache medicine hat used in Ghost Dance" ancient, not merely Ghost Dance device.

2934. Prophylactic ceremonial observances. WS masked dancers representing sazada (W Apache gan) as prophylactic for epidemic; incense leaves (idnize) burned to keep away sickness, not for hunting; plant does not grow in Me region. Me juniper leaves burned for impending epidemic, by anyone.

2935. Clown with maskers. SC clown, hipaye, a spirit. WM gan impersonator used charcoal paint on body, carried stick, but no painted tablet in

hand; see 2967, 2968; gan impersonator did not represent dead, but sylvan spirit. Me ga<sup>he</sup> ceremonies (see note 2983) with 4 spirit impersonators, for curing, for prophylactic against epidemic, for girl's ceremony. Clown might come separately as fun maker, sometimes mocking ga<sup>he</sup>. For prophylactic ceremony, domed brush hut erected for shaman and seated singers. People entered singly to be blessed with pollen, so disease not harm. Ga<sup>he</sup> toward E outside, danced. Each person put pinch of pollen on each ga<sup>he</sup>, beginning with right foot, up right side of body, down left side to left foot. Circuit of people clockwise. Li no gan or masked dancers. KP wipinyim, maskers; navicho, clown.

2936, 2937. Races. Ll, Ol ceremonial relay race only Ll, Ol competition. Body painted for this occasion only. No occasions of reciprocity.

2938. Prayers. WM to Nayitizone in morning, also to his grandmother Istenatlehe. WS when first lit pipe, for long life. Prayed 4 deities (note 2909); cigarette smoked for prayer. Hu cigarette for prayer. Me plain tobacco when praying ceremonially, usually smoked in cigarette form. Li cigarette smoked, only for praying. SU tule pollen pinch on tongue by person going out gave good luck: "Good luck comes to me. Everybody will be good to me. Nomaromapugat, bless me." Also thrown toward sun at sunrise, put on top of head, and a little eaten: "Sun, be good to me all day long and help me day and night." Sun different god from Nomaromapugat. KP not pray at sunrise, but during day. When man smoked pipe, might pray to sun.

2939-2942. Offerings. Note 2938. NT pollen only. SC pollen for daily prayer to sun. Put on chest, shoulders, head, and pinch in fingers when praying for health for self and family. Hu pollen only. No cigarettes laid out as offerings. Zu note 2297. Sun priest and others prayed to sun at sunrise. After prayer, scattered corn meal and turquoise powder toward sunrise. Some Zufi gave corn meal to sun at noon or other times. At meals corn meal in fire for dead.

2943. Eagle ceremony. KP set date for taking young, cage constructed in readiness. 2 boys, age ca. 15, selected by chief and council to get 2 eaglets. 1st lowered to nest with horsehair rope must take older. If flew off, must not take 2d, but leave to 2d boy. Done in early morning when old birds hunting. Many men watched for old birds and hauled up boy before attacked; story of eagle once cutting rope. Corral of ocotillo built and feast by party therein after capture. Eaglets not taken to village. Boys fasted 4 days. Their duty to feed eaglets until old enough (one year) to be plucked; freed after plucking. Then songs and ceremony. Boys purified to prevent sickness. Hunt master and council at purification ceremony. Firewood collected by 2 women for ceremony away from village. Boys sat with plucked feathers before them. No women or children allowed. Chief selected councilmen to make speeches telling boys they would be good hunters, runners, etc. Each councilman sang 2 songs before addressing boys,

breathed on boys, and said: "I'll give you my quality as a good hunter (good farmer, good ball player, good runner, brave warrior, etc.)." This was 1-night ceremony. Songs of eagle cycle but no 2 alike. Sometimes, if not enough men to occupy whole night, repeated to protract till daylight. Done in open near eagle corral. Boys gave 2 feathers to each man. (Instance of eagle catcher who became excellent runner and whose hair grew on arms like eagle feathers.) Every boy did not have chance to catch eagle.

2944. Vigita (harvest) ceremony. KP quadrennial ceremony in Santa Rosa valley with several other Papago groups. Apparently not HP, their ceremonial center being Kaka. I did not record full account of Vigita, but discussed Goddard's account (p. 141 ff.) with informant, which he said essentially correct. Sun and moon represented, not morning star. KP shot deer (not strangled) on cloth representation of mt. and green pastures. Goddard, p. 142: Last paragraph events on 1st evening, not after preceding events. Speech making before dawn, after night of singing. Corral round, opening to E. Masks donned inside. Spectators outside. Maize meal from central basket on post sprinkled with feathered stick on ceremonial objects, not on people. Goddard, p. 141: Masks of singers had only black band across eyes, white below on face of masks; no designs of lightning, clouds, grains of maize. Meaning of black and white? Maize grains painted only on bodies. Representations of maize ears of saguaro wood, in hands of singers. 2 boys and 2 girls once sacrificed to prevent flood, drowned at place near Santa Rosa. Water rising and creator went to inquire what would stop it. This mythical (Goddard p. 143). Circular Vigita corral torn down after use. See note 2215.

2945. Rain ceremony. KP June, July. Feathers on long string between 2 posts in rain ceremony (chukita). 4 shamans tried to bring rain. Waving feathers helped. On this occasion saguaro wine drunk to bring rain needed for maize planting. Might have rain sufficiently in 1 place, but not in another. Ceremony at latter. No bull-roarer to bring rain, but bull-roarer in Vigita (harvest) ceremony at Santa Rosa. Each of 4 shamans demonstrated his power to bring rain. 1 might draw dry stick through his hand, squeezing water from end. Another wrung water from his cotton neckpiece toward end of ceremony. After 2 days, wine fermented sufficiently in pottery jars for drinking. Served in large coiled basket from which dipped with gourd cups. Drunk only at rain (not harvest) ceremony. One man must recite prayer for rain just before wine served. No dry feathers used to sprinkle spectators. HP shaman swung ocotillo stalk at wine (rain) festival (while wine boiling) to determine if going to rain. If gave cool feeling on body, sign of rain. Of 4 shamans 1 chief diviner; others agreed with him. "Deer" ceremony about July at Kaka. Deer's tail carried by messenger in inviting. Quartz crystal, etc.,

in basket, in cotton cloth. If in undoing bundle at ceremony everything in order in basket, good sign; if not, bad sign. If rainbow seen in crystal, sign of rain for crops. If no rainbow, bad sign. If omens good, planting followed. One man called husidolfi (hereditary office) kept bundle hidden in secret place until ceremony.

2950-2952. Buffalo ceremony. Me prayed that buffalo come close. Old woman went ahead. When buffalo started going, she prayed while men did killing. She put fingers over lips and called. Old man or woman directed hunt. If not done, buffalo might hook horse or rider.

2954-2960. Sand paintings. NT shaman made, ca. 6 ft. diam. Pulverized dried wild-squash leaves for blue-green pigment; red, white, yellow mineral pigments. Black, white, yellow, blue circles from outer to inner. Picture of sky god who gave 32 kinds of medicine. Informant would not tell color symbolism. SC 4 concentric rings of black, blue, yellow, white. 8 gods represented in E in black, S blue, W yellow, N white, 32 in all. Color names: ituk orange, ichi red, des white, tuxix blue-green. Ci made only by shaman.

2961. KP order for naming directions, but did not know.

2962. Color symbolism. SC, Hu, Me E black, S blue, W yellow, N white; Ci, WM E black, S green, W yellow, N white. WS E black, S blue, W white, N yellow. Li E black, S white, W yellow, N red. Zu N yellow, W blue, S red, E white, up spotted, down black. SA N yellow, W blue-green, S red, E white, up brown, down black. SI N blue, W yellow, S red, E white, up brown, down gray. Me god Nayiizone mentioned for each direction. In E he traveled on black ray, in S on blue horse, in W on yellow (sorrel) horse, in N on white horse. He was then ready to ascend to sky. SU 2 directional terms; sunrise place, sunset place. Zu colors of maize: N yellow and W blue (guide brothers in dances), S red and E white (brothers), up spotted and down black (brothers). SA no directions connected with maize.

2964, 2965. Shrines. Me cave at S end of Guadalupe mts., where prayed, sprinkled self with pollen. Once Mexicans took many Me captives. Old woman went there and prayed after smoothing floor. Next morning went and saw footprint which indicated captives' return. Another shrine short distance S of Elk store, on trail to Guadalupe mts. Offerings of twigs when passed there. Many rocks there. God Nayiizone put 4 originally and each year 1 since. Prayed for long life, etc. Li twigs or stones as trailside offerings. No prayer. Not to remove fatigue. Ll offering-place on trail near Cimarron. Prayed Earth deity for long life. Ol threw down sticks or grass at offering-places alongside trail. One offering-place near Taos was rock. KP offering-places on mts. where placed arrows, sticks, yucca leaf, etc. Man offered arrow, woman yucca leaf to become good basket-maker; nowadays pennies. Wish uttered for good luck in traveling, etc.

2965. Prayer sticks. KP hosi-yaka. Amina (Russell, p. 106, Pima for prayer stick) means "setting day for ceremony" in KP dialect.

2966. Images. KP image of Hisitoi, creator of man only, in Vigita ceremony. Made of wooden frame, loose cotton wrapped. Not colored. 4 creations.

2967, 2968. Painted wooden slabs. Me impersonators of ga<sup>h</sup>e (W Apache gan) wore and carried.

2969-2971. Ceremonial knives. Me some shamans who knew about cloud people used ceremonial knives or arrowheads which cloud people used when lightning struck trees. SU no cure for lightning sickness.

2972. Peyote use. Me recent from Li. Li ancient, "not from another tribe"; see note 2186.

2973. Taboo to discuss lightning in summer. WN, NT, ST afraid to talk about lightning, thunder, and snakes in summer; all right in winter. Ci shaman, no one else, could talk about lightning in summer.

2974. Taboo to tell myths in summer. SC during long nights of winter.

2975. Taboo to tell myths in daytime. WS Coyote tales at night only. Nayitizone stories any time.

2977-2982. Omens. (See note 2718.) KP, HP rock at Imika (Road runner) in HP country represented woman. Small holes in it, at which men cast small pebbles. If pebble in hole, sign unmarried man would marry. Similar in KP country.

2977. Owl omens. NT owl tells death of friend somewhere; you hear later. WM owl call sign of death. SU owl hit person with stone to make sick. KP owl calling at house to tell happening to relative or friend.

2978. Whirlwinds. SC struck by left-turning whirlwind, bad luck; by right-turning, no harm. WM whirlwind hitting person presaged misfortune, e.g., death. KP wind sickness from being hit by whirlwind. Whirlwind was man in beginning. He went away. "Ghost" in whirlwind is this primeval being, not Papago.

2979, 2980. Sneezing. WM sneezing by man indicated girl talking about him. WS sneezing good or bad omen. When sneezed asked Nayitizone for good luck. Me to sneeze in one's face like cursing person; upset person's train of thought. Held thumb between 1st and 2d fingers toward sneezer to offset. Ol sneezing indicated nothing; earache indicated someone talking about you.

2981. Twitching ominous. Inner side of leg good; outer bad: NT, SC, Ci, WM, WS, Hu. Lower back, omen of carrying deer: NT (should take bow and go at once, carry home on back), Ci (if hunting; if in hut, omen of lying down and dying), WM, WS (also catching horse to ride). NT lip twitching and tears at same time meant some friend far away to die. ST quivering in informant's thigh bad sign, so not talk more about religious matters. Said to come in October and he would tell then. SC outside leg bad (refrain from contemplated journey). Forehead, someone

angry at you. Eyelid, ominous of grief. Ci face from mouth up bad, from mouth down good. WS on outside of leg, bad (hunter would turn back); upper face, hard time getting food; below mouth, food coming. Upper lip, drink if thirsty; upper eyelid, hunter to see game; if scout, enemy; forehead, impending quarrel. Inner arm of wife of hunter about to set out, good luck (hunter to cut deer in leg); outer arm, hunter to carry game. Me twitching told warrior if to be injured or not. Ol only twitching observed was in palm of hand, good luck! KP twitching indicated something bad happened. Whistling fire, plenty of venison and other food.

2982. Animal falling dead bad omen. ST informant ate fawn killed by eagle; no bad result. WM animal falling dead worst of omens. SA falling star bad omen. KP eating animal left by bird of prey dangerous. Bird falling dead in front of person taken to shaman for opinion. He might find it indicated girl relative had 1st menses and not told. In such case, harmful for her. Creature, accidentally injured, struggled away after falling in front of person, sign someone in family might sicken and die.

2983. Supernatural beings seen. WS sazada (W Apache gan spirit) sometimes on high rock ledge (Senahape, rock hanging), W of Ojo Caliente, New Mexico. Clown (siphaiye), kishedji (person black all over). All 3 live on rock ledges. Hu kichedje, black spirit, seen with clown (kipaye) and chadjada (W Apache gan spirit). "All 3 live in 1 house."

Me origin of ga<sup>h</sup>e (W Apache gan spirit) ceremonies ca. 100 years ago. 2 boys, 8 or 10 years old, camping. 1 boy born blind, other cripple, unable to walk. Mexicans raiding Me, so boys abandoned to die. Blind one named "Blind," other named "Can't walk." Blind one carried cripple. Lived at abandoned camps, ate scraps. Made bow. Went up on hill hunting rats. Blind one poked out rats, cripple sat and shot. Finally Tipaye (clown) came along. Saw them making dust poking rats, watched, and asked what they were doing. They told him they hunted rats so as not to starve. He asked where their people were. They told him they were left to starve, had eaten all the scraps, and had hard time getting rats. Clown compassionate, told them to go to certain cave. There they found dead buck. He directed them how to skin it and gave them a flint knife. He had lightning strike a dry tree. They got burning wood from it at clown's order. Clown went home. They built brush hut. They finished their food. Afraid they would starve now. They hunted scraps but found none. Hunted rats. Clown came again and they asked for food. Clown told them to accompany him to chief in cave. They followed clown through rock wall as through doorway. Big fire inside. Clown went on. Boys stopped at fire. Clown told them to follow. Fire was nothing. Came to another wall with closing and opening sharp rocks. Boys afraid, but clown told them to

pass through. They passed unhurt. Next big rattle-snakes striking across path. Clown went between. Boys stopped. Clown told them to follow. Snakes did not hurt them. At last they came to 2 big bears pawing each other. Clown went between. Boys urged to follow. No harm. Then boys saw ga<sup>2</sup>he, how they dressed and acted. Stayed there 4 days, 4 nights. Learned prayers and songs. Returned to outer world. Blind one had recovered sight. Cripple had become sound. Went back to people and showed how to find clown and ga<sup>2</sup>he and how to make costumes for dance. Ga<sup>2</sup>he and clown seen in

wilderness, also 3d kind of supernatural being, black person called Ishedi (black). All 3 live together. Ol knew of ga<sup>2</sup>he, clown, and black being among Me, but denied for themselves.

2984-2990. Water monsters. WS at Mangas mt., pool on top; if person failed to pray might see 2-horned buffalo-like creature in water; sometimes it went on bank. Whirlwind might throw person in water. From distance could see monster's eyes in water. Me monster took people in water, never to return; appearance not known. KP water monster could swallow prey from mile distance. Nyirupi is name, now applied to rhinoceros.

#### NOTES ON HABITATS AND TRADE

The following notes do not attempt to picture the habitat of each group. They are miscellaneous items from informants about certain animals and plants and about trade relations, etc.

WN.—Obtained mesquite near Williams. For trade Hopi and Zuñi visited Navaho regularly. Navaho visited them less frequently. WN obtained buckskins from other Navaho in favorable locations for taking deer.

EN.—The region about Tohatchi, New Mexico, afforded both mountains and plains. No body of water big enough for use of raft, bullboat, or other water craft. Informant had heard of mescal being got by old people in travels, but none in Tohatchi region. "Existed in former times, until world fire which destroyed sharp-pointed plants." Floral differences attributed to world fire before the Emergence.

NT.—No quail in Strawberry v. in higher part of NT range; obtained in lower part of Fossil Creek drainage near Verde r. No elk or prairie dogs in region. For mesquite and saguaro, NT of Strawberry v. descended to E side of Verde v. near mouth of Fossil cr. NT regarded Yavapai, their W neighbors, as friends. No Yavapai resided among them in either Strawberry v. or on Fossil cr. Pima were enemies ("bad men"). Traded mt.-lion skins, buckskin, mescal to Hopi in return for iron knives, guns, powder, caps for gun, blankets, iron axes, iron hoes, donkeys (for food). No trade with Navaho.

ST.—Mesquite gathered in Verde v. No elk or prairie dogs in ST habitat. Made trips to Hopi pueblos to trade; Hopi "like relatives"; ST and Navaho greeted one another as brothers. Traded 2 buckskins to Navaho for 1 horse. Traded buckskins, feathered caps, and manganese oxide to both Hopi and Navaho for turquoise and white shell beads. Hopi, Navaho, and Zuñi visited ST to trade, bringing powder, guns, horses, etc. For 1 gun ST gave 1 buckskin and 1 mt.-lion skin; for 1 measure of powder or of lead bullets, a turkey feather cap, a pad of mescal, or a basket.

SC.—Arivaipa canyon was held by SC. Pinal band, ST, and Yavapai were allies. No villages, but moving about from place to place. Farms in valley from Miami to Wheatfield. Traded quivers to Yavapai of Verde v., to Apache of Chiricahua mts., and to Navaho. Navaho visited SC and vice versa; traveled through friendly tribes. Hopi called tsekachi, "people who live on mesa." Wheatfield v. was special place for mesquite. Antelope hunted near Cutter. No jaguars or prairie dogs in Pinal mts.

Ci.—Mesquite from lower regions to S, at confluence Cibecue cr. and Salt r. Also bedrock mortars there. Friendly with SC, and in early summer went toward San Carlos for saguaro fruit.

WM.—Information recorded in element list concerns eastern WM. Western WM band were Cedar Creek (Tonkaye) people, who seldom went to S end of their territory for fear of enemy Tonto Apache. Eastern WM regularly traveled S to Ash Flat (3 days' journey) and other places for various foods: acorns, mescal, sunflower seed. No mesquite there, as too high; mesquite obtained ca. 2 mi. S of Black r. No screw beans or White-winged Doves at Ft. Apache. Went to end of hill 4 mi. N of Bylas to get saguaro. Bylas people now eastern WM, but before whites came Bylas was either Tonto or SC territory. Navaho blankets brought by traders used for sweat-house cover. Buffaloeskins by trade, not used over sweat house.

WS.—Chokalene and Chihene bands occupied headwaters of Alamosa, Gila, and San Francisco rs., ranging southward to Mexican border where Inde<sup>2</sup>dai band centered. W neighbors and friends were WM. Hu informant placed Chihene at Ojo Caliente (Warm Springs) and Chokalene to S of Mangas mts. Some Chokalene and Chihene were mixed with Inde<sup>2</sup>dai and Shaiahene (Hu) in SE Arizona. Formerly ranged across Rio Grande to Me country. Much shifting about, probably largely because of Caucasian pressure. Long ago had hostilities with Navaho and Zuni. WS habitat too remote from plains for buffalo hunting; no saguaro in region. Elk near Mangas mts.

Hu.—One of 4 groups speaking one language: (1) Chihene and (2) Chokalene listed as WS; (3) Inde<sup>n</sup>dai who lived S of Mexican border; (4) Shaiahene whom I have called Huachuca Apache (Hu), because they lived in Huachuca mts., though they ranged NE to Mangas mts. All 4 apparently constituted Chiricahua or Mimbres Apache. Shaiahene (sunset people) got rations with Chokalene near Bisbee, Arizona. Name for Huachuca mts. was Chihe. To W of Shaiahene was another Apache group with different dialect. Shaiahene were under chief Mangas Colorado like Chokalene and Chihene. To SC of Arivaipa canyon Hu applied term Binyetine (crazy) because of their slaughter of enemy children; friendly with Hu. Hu said no elk, mt. sheep, turtle, or fish in Huachuca mts. Peccary there, but more abundant to S; jaguar in region to S also. No saguaro in Huachuca mts., but grows to N.

Me.—Natohene (Mescalero) means "mescal people." Three bands: (1) Kahoane. Lived in San Andres, Organ, and Oscura mts. S to El Paso. Ranged N to Santa Fe. (2) Ni'ahane. Lived in Sacramento mts., Guadalupe mts., Sierra Blanca, and Capitan mts. (3) Huskaane. Lived in Pecos v. from Ft. Sumner S to confluence of Pecos and Rio Grande. Huskaane means "plains people." Kahoane means "people of ridge descending abruptly to river" (viz., Rio Grande at S end of ridge). Ni'ahane means "people of Nikachaa," i.e., of "terraced mts."

Comanche (Indassene, from indas, enemy) were principal enemies and lived to E of Huskaane. Navaho, Kiowa, and Kiowa-Apache were also enemies and raided Me, especially Huskaane, for horses. Jicarilla were friendly and were called Chiyahene (living close to house people). Of the 3 Me bands, Kahoane, the western, had fewest horses; Huskaane, the eastern, had most. Tunsane, "big water people," Me name for Lipan. Shaiahane, western people, is general term applied by Me to Warm Springs and Huachuca Apache, whom they now call Chiricahua also.

Huskaane farmed around Hope and Lincoln. Kahoane did least farming. Ni'ahane principal farming centers on Rio Penasco, at La Luz, and near Glencoe. Guadalupe mts., in S part of Ni'ahane range, had many springs, better stocked with game than Sierra Blanca in N. Elk, white-tailed deer, black-tailed deer in Ni'ahane territory. Mesquite grew on SE and W slopes of mts. No jaguars. All 3 Mescalero bands hunted buffalo, which came to base of Capitan mts. Buffalo around Ft. Sumner agency, but people did not like flat country and difficulty of getting wood, so transferred to present reservation in mts.

A fourth band called Tuetenene lived in arid country S of Me. Tuete means "no water." The people largely depended on rain-water holes in arroyos and occasional springs. They were said to be half Mescalero, half Lipan in blood. Tunsane, Lipan, lived on both sides of Rio Grande downstream from Tuetenene. Zitachisene, an Apache group near Chihuahua City, were their neighbors to S and SW.

Li.—Chishene (timber people) was E band, who lived NE of Rio Grande. (Informant's mother and maternal grandmother from this band; her father was Tuetenene, hybrid Me-Li group.) Tuensane (big water people) was W band, who lived SW of Rio Grande. Li called Me Inatsahesene, called Tuetenene Inatsahene Tuetenene. Tuetenene made baskets and used metate, 2 traits neglected by Li. In Chishene country Li played with "alligators" (iguanas?), a tale told informant by her mother and mother's mother: Kicked "alligator," which slapped with its tail. One "alligator" bit off little girl's fingers. Roped it, dragged out and killed. No playing with "alligators" thereafter. "Alligators" reputed to come into camp and play with girls' breasts; "cold hands." "Alligators" ate cactus fruit. Women gathering slapped on nose with moccasin. Li once had fight with Kickapoo, an intrusive tribe in region.

Ll.—Ranged from Trinidad, Colorado, to Las Vegas, New Mexico. Mora and Raton regions visited. Cf. Opler, 1936a. Did not regard country as exclusively theirs; friendly groups hunted there too. Ll followed buffalo especially. Ranged W to present reservation where friends with Ute. E limit of range? Taos and Picuris were principal Pueblo friends; friendly with all Pueblos. Enemies were Comanche, Kiowa, Cheyenne, Mexicans. No mescal in Ll habitat. Ll, Ol ate meat every meal, thus evincing Plains dietary. Both Ll and Ol denied ever having lived in Jicarilla mts., New Mexico.

Ol.—Called selves Setidê (sand people), called Ll Gusgayi (plains people) because lived in plains. Ol ranged into present reservation, but particularly along Chama r. and S as far as Santa Fé. Were pottery makers, trading ceramic products. In buffalo hunting, Setidê went upstream to Taos and on to Cimarron and beyond. Informant was on one buffalo hunt when a boy. The people went on account of smallpox epidemic, which they hoped to escape. Deermeat was standard flesh; buffalo meat only when hunting. Very little mescal in Rio Chama country, not used for food. No sotol, no walnuts. No peccaries or jaguars. Always friendly with Pueblos. San Juan (1st) and Santa Clara (2d) were their chief friends. Plains tribes were enemies, especially Comanche and Kiowa. Pretty nearly all "Oklahoma Indians" were enemies to Jicarilla. Navaho were enemies. Best friends were Ute, with whom Ol roamed in early days. Area of present reservation not claimed by either Ol or Ute.

SU.—Range entirely N of San Juan r.: La Sal mts., Utah, Ute Peak, Colorado, and Mesa Verde in region ranged over by informant's band (Wemenuis). Born between La Sal and Blue mts., Utah, and brought up in that general region. No villages. Moved around all the time. Navaho, neighbors to S, called Pagauwish, "cane plant people." To N were Taviwas Ute, to NW were Muwatchi Ute, to E Pota Ute. Muwatchi and Pota now on reservation at Ignacio, Colorado. To SW

were Paiute. Three Wemenuis place names: Ewevas (alkali spring); Aukagalachi (dead juniper tree hill); Wechewigadi (Spanish bayonet yucca fruit there), the region around Towaoc agency. Wemenuis hunted buffalo on horseback near Antonito, Colorado, usually ca. October. Wemenuis did not hunt with Jicarilla, but Pota band did. Horses scarce formerly, were loaned around. No wild turkeys in region.

Wa.—Acorns from Black mts., ca. 20 mi. NW of Wa. No cattail grew in Wa region; no quail.

Zu.—No quail in Zu region. Hides and turkey feathers from Apache.

SA.—No mt. sheep in region. Buffalo hunted to E of Tucumcari, New Mexico.

SI.—Population Catholic "ca. 200 years." Informant, his father, his grandfather were Catholic. Antelope hunted about 30 mi. S of Galisteo, New Mexico, in Pecos drainage, not far from salt lake at Willard. Buffalo hunted near Tucumcari, New Mexico. Friends with Comanche, with whom traded. Obsidian from W side of Bayi Grande, a mt. ca. 20 mi. W of San Ildefonso, to NE of Sulphur springs, and NW of Redondo peak, a white rock on E side of Jemez mts.

KP.—Informant drew boundary lines on map 2 and gave names for divisions of Papago and Pima. Pima groups: Akimü'otam, river people; Kohatk, Bitter Wells region. Papago groups: Anikam, A'asatse (Santa Rosa in this area), Kikimai (Komovavi in this area; KP informant's division), O'otaham (E of Sells), Kokodolti (Poso Verde and southern Akchin in this area), Koosichits (Kuitak, seat of supreme religious chief, in this area), Huhula (Kaka and Imika in this area; HP informant's division), Iatakkowatam (N Sand Papago), So'opamakam (S Sand Papago). The first 7 Papago groups spoke slightly different subdialects, mutually intelligible. Sand Papago most different from other Papago. For certain of the Papago division names KP informant gave meanings or at least mentioned attributes:

A'asatse refers to E Papago speech (?). O'otaham means "the people," subdialectic variant of o'otam (people). Kikimai means "high-toned or cultured people." Kokodolti refers to subdialect with "faster speech." Huhula means "very fast speech." Iatakkowatam means "sandy hills root eaters," a plant growing near gulf. So'opamakam means "early morning movers." According to Juan Dolores the dialects or subdialects are only 5 in number: (1) from San Xavier and Tucson W to Huhula boundary. (2) Huhula. (3) Kokodolti (coyotes). (4) S of Kokodolti. (5) Sand Papago. According to tradition, Papago came from E and fought for country as far as Vakita in Sonora. Then returned to Sacaton. From there settled country as above.

KP summer and winter villages. Summer (Akchin) for farming. After harvest W to winter village (Komovavi) on account drought. If winter rains came early, planted wheat in November. If no winter rains, no wheat planted. At Komovavi were water holes. Akchin and Komovavi were day's journey apart on foot. Farming at Akchin without irrigation. Stock watered at Komovavi.

KP country lacked desert willow and willow (Salix), latter imported from Pima; cottonwood, piñon, bear grass, and screw bean, though last grew at Sacaton in Pima country. Following animals lacking: prairie dog, wild turkey, elk, jaguar, chuckwalla.

HP.—Most westerly Papago group investigated. Both informants claimed that HP formerly lived on S bank of Gila r. in Gila Bend region. N bank belonged to another people, probably Tolkepaya (W Yavapai). No knowledge of ancient Yuman peoples holding S bank (Spier, 1933, fig. 1). HP called Santa Rosa Valley people Pipchin after mt. Pisinimo, also called them after place A'achi. Mui-vaxia was place HP of Kaka watered live stock. In spring people went to ponds or tanks in desert and planted. When these dried up people returned to well at permanent residence. In HP country no piñon or oaks; went to mts. SE of San Xavier for acorns.

## ANALYSES

Analyses have been undertaken in two ways, which might be termed qualitative and quantitative, but neither exhausts the analytical possibilities of the material. The first analysis discusses universal elements and elements characterizing blocks of tribes. The second analysis, by A. L. Kroeber, is statistical and has for its aim the numerical expression of degree of cultural relationship of each group to all others and the graphic presentation of total relationships within the part of the Southwestern area treated.

Certain premises with which the reader may or may not agree underlie the analyses. In the first place, the "atomizing" of elements has not been complete or uniform. Thus, 744, smoke hole in center, may be regarded as representing an irreducible minimal element; whereas, 2944, Vigita (harvest) ceremony, is a complex of perhaps a hundred or more elements. In the element counts these extremes are counted alike; no attempt has been made to weight elements according to whether they are irreducible minima or complexes. Thus, the very process of reducing an original 4000 elements to 3000 involved the combining of minor elements or their relegation to supplementary notes. It is maintained, however, that, whether we deal with 3000 more or less incompletely atomized elements or with 6000 thoroughly atomized, irreducible elements, the general relationships of tribe to tribe will be approximately the same.

Underlying much of the qualitative analysis which immediately follows are the assumptions that linguistically related or culturally related groups should be most alike in culture. Thus, the blocks of tribes selected are largely on this basis: all Athabascan, all Apache, W Apache, all other Apache, etc., or all Pueblo. In the statistical or quantitative analysis no such assumptions are made, so that it will prove to be far more objective and the findings possibly correspondingly more valid.

### UNIVERSAL ELEMENTS

What might be regarded as the fundamentals of Southwestern culture are those elements present in all 20 groups investigated. (Traits positively recorded for 19 groups, but not inquired about among the incompletely investigated HP are included.) Sixty universal elements from the total of 2990 elements are listed below. These are of such a general nature in most cases that they hardly characterize the SW or any other culture area, except where they depend on environmental features, such as the presence of Spanish bayonet yucca. Including such environmentally determined traits, the statement is warranted that at least two per cent of the culture of the entire region is universal to the groups in the region. More-

over, 2 of the included groups, SU and Li, are probably actually Great Basin and Plains respectively, rather than SW.

For 16 Pomo<sup>e</sup> and 4 neighboring groups in California universal traits constitute between 3 and 4 per cent of the total of about 1100 recorded elements. In this case, I have counted 24 universals and 16 that were common to 19 out of 20 groups, but not inquired about in the 20th. Hence the case parallels that for the SW and comparison seems warranted. The higher percentage of universal presences among the Pomo and neighbors is expectable in view of the small, compact area occupied. Conversely, the lower percentage of universals in the heterogeneous, scattered groups of the SW is expectable, precisely because of their far-flung distribution and varied environments.

The 60 SW universal elements are as follows: 1, stalking game; 52, stick twisted in fur to extract rodent from burrow; 105, surround method in communal hunting; 198, slain animal skinned lying; 218, turkey vulture not eaten; 257, hardwood digging stick for bulbs, roots, etc.; 260, digging stick 1 1/2 to 3 ft. long, 1 to 2 in. thick; 331, Spanish bayonet yucca fruit eaten; 354, tuna (prickly pear) fruit eaten fresh; 403, greens boiled to eat; 405, snow used for drinking and cooking; 436, kitchen outside house in summer; 439, meat roasted on coals; 441, meat boiled; 447, boiling in clay pot; 460, meat sliced and dried; 466, dried venison pulverized; 470, marrow extracted; 684, hawks killed; 688, eagle feathers plucked; 990, natural cobble for maul; 1016, simple fire drill; 1019, dead wood for fire; 1020, dead wood for fire broken over stone; 1023, skinning by cutting down belly; 1034, hide soaked in water before dehairing; 1037, scraper drawn edgewise in dehairing hide; 1038, hide over leaned pole in dehairing; 1041, dehaired hide softened with brains and spinal marrow; 1042, hide twisted to express water and to soften; 1050, rawhide used; 1055, self bow; 1101, one-piece arrow, without foreshaft or head; 1103, one-piece arrow of willow; 1108, one-piece arrow feathered; 1134, arrow feathering radial; 1136, arrows 3-feathered; 1154, hide wristguard; 1171, quiver open-skinned and sewn; 1279, red mineral pigment (ocher?) used; 1286, white mineral pigment (clay) used; 1303, beard plucked with fingernails; 1313, women wore hair full length; 1354, hair washed with yucca suds; 1421, buckskin belt; 1511, sitting with one leg folded back, other knee up; 1512, men sat on buttocks, knees up; 1525, walking stick for elderly person; 1543a, pack strap for carrying burden; 1550, hide pack strap; 1737, cordage made by men; 1752, cordage of sinew; 1950, foot-racing without "stick" by men and boys; 2131, archery games; 2179, bedtime

<sup>e</sup>Gifford and Kroeber, 1937.

smoking of tobacco; 2254, counting on fingers; 2348, any female relatives or neighbors help at childbirth; 2617, some personal property of deceased destroyed; 2643, cooking by women; 2679, women own household utensils.

Of the 40 Pomo universals, 5 are also universal in the SW: 285,<sup>7</sup> marrow extraction; 373, fire drill; 383, digging stick; 455, quiver of animal hide; 738, destruction of property after death. Certain SW universals, as, for instance, stalking game, certainly occur among the Pomo, but were not inquired about, probably because I assumed that it was "too natural" an act to even bother asking about. It is of interest to note that the 5 shared universal elements are not even distinctively American Indian.

Certain Pomo universals are widespread in the SW, or occur, but are not universal there: 63, ear lobe bored; 105, carrying cradle on back; 109, head position of strap for cradle and burden; 121, carrying basket of tight weave; 147, 3-rod coiling in basketry; 152, seed beater of basketry; 175, withes; 289, earth oven; 306, stone boiling; 356, scraper or knife of split cobble; 360, bone awl for making coiled basketry; 430, straight pole for knocking off nuts; 545, whistle of bone; 550, flute; 589, guessing hand game; 645, price or presents or service for bride; 646, bride's parents also present gifts; 688, taboos on work at birth of child; 689, taboos on travel at birth of child; 698, baby named after dead grandparent or kin; 878, shaman sucks out disease object.

This leaves a residue of 14 Pomo universals unrepresented in the SW. Let us see the character of these: 36, man's hair net; 81, down-filled hair net; 89, flicker-quill headbands; 101, sitting cradle of deep type; 305, acorn bread cooked in earth oven; 323, yellow-jacket larvae eaten; 478, earth-covered assembly house with single center post; 539, split-stick rattle; 541, foot drum; 547, whistle stop of pitch or asphalt; 556, clamshell-disk money; 558, magnesite cylinders used as treasure; 593, tep and wei calls in hand-game guessing; 650, marriage to other tribes. Were the whole of California considered some of these items would drop from the universal list. Their universal distribution in the 20 Pomo lists is due to the narrow environmental and cultural limits of the tribes covered. It is axiomatic that the larger the area, the fewer the universals. Such an item as 101, sitting cradle of deep type, although universal to the Pomo area, is a specialization that appears as a universal only because the field of investigation was narrowly limited. It contrasts markedly in character with the 5 joint Pomo-SW universals which are of Old World as well as New World occurrence.

If we regard SU as essentially Great Basin people rather than Southwestern, it is possible to increase the SW list of positive universal

elements by 9, by adding to it those traits present everywhere except among SU.<sup>8</sup> The elements are the following: 984, fire to render wood flexible; 1045, coloring leather; 1173, quiver of mt.-lion skin; 1219, sling; 1541, water-carrying in gourd canteen; 1861, pottery-making; 2509, parents approval necessary for marriage of young couple; 2583, burial; 2592, corpse lowered into grave.

Carrying the principle a step farther and including traits found universally in the SW except among the Li, a Plains people, the following 6 additional elements may be counted as universal in SW culture: 857, rectangular-type (back-forth) metate, 869, set up so slopes away at angle; 872, muller meant for 2 hands; 901, brush of grass bundle tied in middle; 1667, scraper of stone flake for basketry material; 2679, basketry ownership.

This gives a grand total of 75 universal positive elements among the strictly SW tribes (omitting SU and Li) investigated in 1935.

#### CHARACTERIZATION OF BLOCKS OF TRIBES BY UNIQUE FEATURES

In scanning the element list for traits peculiar to and universal in certain linguistic groups the results are relatively scant. Thus the 13 Athabascan groups exclusively, share only one trait, and this really linguistic, which was not recorded as present by me from any other Southwestern group, to wit: 2268, designating the constellation Little Dipper by a term meaning "pivoting." But even this is not a unique Athabascan trait, for Dr. I. T. Kelly informs me that the Southern Paiute use a similar appellation. Naturally the larger the number of tribes in which one seeks to find universal peculiar elements, the less the chance of finding such. Consequently, it is in single groups like SI or dual groups like Papago (KP, HP) that the unique elements prove more abundant. Undoubtedly it is asking too much to expect any considerable number of peculiar traits to characterize all members of large groups of tribes, since the contacts of these with surrounding groups are numerous and elements possibly once unique have had opportunity to disseminate. Consequently, in the following sections characterizing blocks of tribes, I have not always limited the enumeration of elements to those peculiar to the groups in each block but have included sometimes those universal to the blocks even though found elsewhere. Which procedure is followed is indicated in each case.

#### Elements Common to all Athabascan Groups

Regarding the Athabascans of the Southwest as comprising 3 principal groups (Navaho, Western

<sup>8</sup>My SU list suffers from the refusal of the informant to discuss war, owing to a general order of the incumbent chief to all of his constituents.

<sup>7</sup>Pomo numbers for Pomo elements.

Apache, and other Apache including Lipan), we find positive traits shared wholly and exclusively by the WN and EN with the W Apache, but with no other groups, to be nil; likewise with negative traits. Similar statements apply to Navaho and other Apache.

121 elements are common to all 13 Athabascan groups investigated. Subtracting the 60 universal SW elements leaves 61 others, which, with the exception of 2268, designating Ursa Minor as "pivoting," are found in one or more other SW groups. Needless to say, there would be more than 121 if Navaho social and religious elements had been investigated. The 60 universal SW traits included have been listed above. The 61 other universal Athabascan traits are as follows:

216, eagle not eaten; 332, Spanish bayonet yucca fruit cooked in coals; 333, Spanish bayonet yucca fruit dried and stored after seeds discarded; 336, Spanish bayonet yucca root stalk for soap; 364, piñon seeds gathered from ground; 381, "grass," etc., seeds eaten; 437, brush enclosure or windbreak for summer kitchen; 965, awl for skin sewing; 984, fire to render wood flexible; 1035, hide dehaired with cannon-bone tool; 1045, coloring of leather; 1089, bowstring of sinew; 1094, two-ply bowstring; 1107, one-piece wooden arrow with sharpened point for small game; 1137, standard feathering of arrows 3; 1173, quiver of open-skinned, sewn mt.-lion hide; 1219, slings; 1260, turquoise used; 1264, pendants of turquoise; 1300, red paint and fat to protect from chapping; 1310, men wore hair full length; 1355, hair greased with fat or marrow; 1459, hard-soled moccasins; 1460, 2-piece hard-soled moccasins; 1486, pad of vegetable material as bedding; 1505, men sat crosslegs (Turkish); 1513, women sat with feet curled under; 1541, water carried in gourd canteen; 1546, pack strap across shoulder, chest; 1721, cradle tying laced through loops; 1722, hide pack strap for cradle; 1723, cradle carried hanging on back; 1725, cradle pack strap over shoulder-chest; 1861, only women made pottery; 1965, "shinny" ball driven with curved stick; 2059, wooden stave dice game, 2060, 3-stave game, 2063, throw staves on stone, 2064, circle of stones for count, 2067, number of spaces in circle of stones 40, 2069, safety spaces in circle of stones, 2070, counting stick "killed" if met, 2072, kept going if overrun, 2074, all plain staves up count 10, 2074a, 10-throw entitles to another throw; 2268, "pivoting," Ursa Minor; 2339, parturition in dwelling house; 2425, boy's play with sister taboo after puberty; 2433, girl at 1st menses in dwelling, 2437, for 4 days; 2508, couple make own choice in marriage, 2509, subject to parents' approval; 2575, man left home in wife's possession at divorce; 2583, burial, 2589, lying, 2591, stretched, 2592, lowered in; 2683, following death undestroyed property inherited; 2697, war council; 2721, surprise attacks; 2723, prisoners taken; 2742, victory dance.

The problem of the cultural relationship of the S Athabascans of the SW to the W Athabascans

of California and Oregon and to the N Athabascans of Alaska and Canada is one which should ultimately be considered. Perusal of Osgood's<sup>o</sup> tabulation of Kutchin culture elements shows a number of elements which also occur among Athabascans of the SW, but only a few of these are in the list of universal S Athabascan traits. I mention this as foreshadowing the difficulty of reconstructing the original Athabascan culture even after a large number of element lists has been recorded. The fact that only a few of the Kutchin elements are found in the S Athabascan universal list of 121 elements and that several of those found are also universal SW elements indicates that the S Athabascan universal list has been largely conditioned by environment and neighbors and probably does not represent any great heritage of original Athabascan traits. Similarly Osgood's Kutchin lists largely reflect environment and neighboring cultures. What is really needed for proper comparison with the 121 S Athabascan universals is a list of N Athabascan universals. However, it seems predictable that such a N Athabascan universal list will reflect environment and contiguous culture in about the same degree as does the S Athabascan universal list. Perhaps elements common to 75 per cent of the Athabascans of each of the three regions could safely be regarded as constituting early predispersal Athabascan culture, although even these might include some later accretions.

S Athabascan universal elements among the Kutchin: 105, communal hunt surround by people in circle; 1051, rawhide used; 1055, self bow; 1136, arrows 3-feathered; 1219, sling; 1279, red mineral pigment; 1310, men wore hair full length; 1313, women wore hair full length; 1543a, pack strap; 1546, pack strap across shoulders, chest; 1550, hide pack strap; 1752, sinew twisted; 1950, running races without stick; 1965, shinny.

Examples of Kutchin elements which are also nonuniversal S Athabascan elements: hunting with dogs, stuffed viscera eaten, fetal animals eaten, hot-stone boiling, strike-a-light, tattooing, ear boring, necklaces, sweat house, pit-falls for animals, stone pestle, one-piece wooden dishes, skin bags, tambourine drum, dolls, buzz toy, hoop-and-pole game, matrilineal sibs, scratching stick and drinking tube at girl's puberty, etc.

#### Navaho Elements

Navaho elements found among no other SW Athabascans totaled 163. 69 of these were found in both Navaho groups, 12 in one Navaho group but not inquired about in the other, and 82 present in one Navaho group but lacking in the other. 35 of the 163 are unique Navaho traits found among no other SW groups investigated in 1935. They are the following: nos. 65, 76, 147, 706,

<sup>o</sup> Pp. 175-188.

714, 718, 735, 798, 799, 1197, 1365, 1429, 1443, 1480, 1483, 1593a, 1791, 1795, 1848, 1849, 1850, 1851, 1852, 1888, 1957, 1981, 1982, 1985, 1997, 2031, 2042, 2422, 2519, 2524, 2769. Two WN traits listed above (76, 1593a) suggest that WN are beginning to show the influence of their Yuman neighbors to the W,<sup>10</sup> in spite of brief residence in the region.

The remaining 128 Navaho specialties found among no other SW Athabascans are distributed, however, among 1 to 6 non-Athabaskan tribes as follows: Zu 83, Wa 71, SA 62, SI 58, KP 40, HP 35,<sup>11</sup> SU 15. The large number of these elements shared with Pueblo and the small number shared with SU are striking and indicative of the affiliations of Navaho culture in modern times at least. The Pueblo resemblances are expectable on the basis of contiguity. Apparently the difference between Zu and Wa truly indicates closer affiliation of the Navaho with the former. The reason for the relatively high number of items shared with distant KP is not apparent. The statistical analysis should be consulted for the total relationship of the Navaho groups to each of the 7 non-Athabaskan groups as well as to the various Apache groups. All the present analysis aims at is to show in what direction the Navaho non-Athabaskan specialties point.

Of the 82 elements (included in the preceding counts of 163 and 128) present in one Navaho group and absent in the other as well as among all other SW Athabascans, 19 were found among no other SW groups investigated in 1935 and have been included in the 35 unique Navaho elements listed above. Of the remaining 63, 39 are WN, 24 are EN. The 39 WN are shared with non-Athabaskan groups as follows: Zu 22, Wa 20, SA 19, SI 16, KP 16, SU 4, HP 4 (actually 1); the 24 EN as follows: Zu 14, Wa 12, SI 11, KP 11, SA 10, HP 14 (actually 4), SU 2. These distributions of WN and EN specialties shared with non-Athabascans again indicate Zu in first rank, Wa in second for both Navaho groups as for the total 128 non-unique Navaho specialties discussed above. SA is third for WN, fifth for EN with distant KP exceeding it by one. Almost equally inexplicable is the even sharing of WN specialties with SI and KP. In both groups SU plays an almost negligible rôle as in the preceding total count of 128 non-Athabaskan, nonunique Navaho specialties. The analysis of 63 traits present in one Navaho group and absent in the other does not indicate that WN shares its specialties preponderantly with one set of tribes, EN with another, but rather that each shares different specialties with the same 7 non-Athabaskan tribes, with both according Zu and Wa first and second rank respectively.

A count of elements present in one Navaho group but absent in the other illustrates the

local variation. 204 elements present in WN were declared lacking (or modern) in EN, while 206 elements affirmed for EN were denied by WN. The EN informant was very "historically" minded and said certain elements were modern in EN. Probably such were modern in WN too, but I took the WN informant's statements as to antiquity of traits at face value in making the count. Probably some errors are incorporated in the count, but even so there must be a considerable number of bona fide local differences, possibly not all of long standing, however. Another pair of groups, 11 and 01 comprising the Jicarilla Apache, show an almost equal amount of diversity. That some differences have arisen since the inauguration of reservation life is entirely reasonable to suppose.

#### Apache Elements

In addition to the 121 universal SW Athabaskan elements, the 11 Apache groups investigated have 38 other universal Apache elements, bringing the grand total of Apache universals to 159. This all-Apache-foundation culture comprises besides the 121 SW Athabaskan universals the following 38 universal Apache elements, all of which occur in other SW groups, none being exclusively Apache: 143, tobacco smoked as part of religious preparation for hunt; 279, spines brushed off cactus fruit; 398, pollen used ceremonially; 803, windbreak of branches; 892, stone pestle; 1003, flint flaking with stone, by blow (probably SW universal, but no data from WN, HP); 1104, one-piece arrows of wood other than willow; 1122, arrowshaft painted near base; 1141, hawk feathers on arrows; 1142, turkey feathers on arrows; 1180, quiver carried on back; 1220, sling as boy's toy; 1277, pigment kept in skin sack; 1324, men part hair in middle, 1325, women likewise; 1384, robe, shawl, or cape of hide with hair on; 1527, men carry some property when traveling; 1718, belt lashing, of buckskin for cradle; 1730, cordage twisted on thigh; 2128, quoits, in hole; 2129, buzzer toy; 2315, horizontal new moon means drought; 2316, vertical new moon means rain; 2447, girl at 1st menses uses scratching stick; 2501, monogamy; 2563, joking relations; 2604, house of deceased burned; 2638, wood getting by women; 2640, house building by women; 2642, water fetching by women; 2681, skin bedding owned by women; 2714a, scouts in war; 2726, children taken prisoner of war; 2730, captive children adopted; 2745, women participate in victory dance; 2748, victory dance in circle; 2800, official messengers; 2831, parallel cousins called siblings. Probably some of these would prove to be universal Athabaskan traits if my WN data were fuller.

#### Western Apache Elements

The reality of my impression that W Apache (NT, ST, SC, Ci, WM) culture is different from the culture of the 6 other Apache groups investigated is attested by 87 elements listed by number

<sup>10</sup>Gifford, 1936, 267, 282.

<sup>11</sup>Only 851 of the 2989 elements were inquired about among HP. In consequence, I have estimated all HP resemblances at 3 1/2 times the actual count in the "qualitative" analyses.

below, which are found among 5 to 3 of the W Apache groups and among no other Apache groups; also by 82 traits listed beyond for 6 to 4 other Apache groups and entirely lacking among W Apache.

If the occurrence of the pairs of absences in 3 out of 5 W Apache groups are tabulated, it appears that contiguous Ci-WM are the most aberrant couple, with 13 absences. Next in order follow NT-SC 4, SC-Ci 3, SC-WM 3, NT-ST 2, NT-Ci 2, ST-SC 2, ST-WM 2, ST-Ci 1, NT-WM 0. In addition 3 elements (1047, 1146, 2615) were lacking among WM, although doubtful or not inquired about in one other W Apache group. The frequent absence of the distinctive W Apache traits among Ci-WM and especially WM is perhaps the result of the eastern marginal position of WM at least. Reinforcing this suggestion are the 23 elements found in 4 out of 5 W Apache groups and lacking in other Apache groups. Thus, of these 23 traits, 14 were recorded absent (balance not inquired about) in W Apache groups as follows: NT 3, ST 3, SC 1, Ci 3, WM 4. Again marginal WM slightly excels other W Apache in absence of typical traits.

#### Other Apache Elements

Universal to the 6 other Apache groups (WS, Hu, Me, Li, Ll, Ol) visited, but wholly lacking among the W Apache are eleven elements. Added to these are 15 elements, almost equally typical since they occur in 5 out of 6 of the groups. The absences recorded for this group of 15 are distributed as follows: WS 4, Hu 4, Me 1, Li 2, Ll 2, Ol 1. These figures by themselves mean little, since WS and Hu are divisions of the "Chiricahua" Apache and Ll and Ol of the Jicarilla Apache. They become more significant, however, when the list of 56 elements found in 4 out of 6 Apache groups and lacking among W Apache is considered. These, and more especially the pairs of absences, indicate that the 6 Apache groups other than W Apache are not a unified block, but belong in 3 or 4 clusters: one comprising WS and Hu, the so-called Chiricahua Apache; another Ll and Ol, the Jicarilla Apache; and lastly the Me and Li which are probably to be regarded as culturally distinct, though the distinction has now been somewhat blurred by the Me absorption of Plains elements.

The distribution of absences in the list of elements common to 4 out of 6 of the "other" Apache groups indicates the artificiality of regarding these 6 groups as a closely knit cultural unit. Thus, of the 15 possible combinations of the tribes in pairs sharing absences, WS and Hu share 30, Ll and Ol 16, WS and Li 3, WS and Ol 2, WS and Me 1, Hu and Me 1, Hu and Li 1, Hu and Ol 1. It is obvious that WS and Hu form a western block, the "Chiricahua," and Ll and Ol a northeastern block, the Jicarilla. Further confirmation will be found in the statistical analysis.

#### "Eastern" Apache Elements

The term "eastern" is here used to cover WS, Hu, Me, Li, but not Ll and Ol. WS and Hu consti-

tute the Chiricahua, Mimbrenos, or Mogollones Apache. As Opler indicates, these differ from Me in having been less influenced by Plains culture.<sup>12</sup> Opler's opinion as to the recent development of agriculture among the Chiricahua is partially substantiated by my data which indicate it absent among the Hu, although present among the WS (Chihene and Chokalene bands). Seven unique elements common to WS, Hu, Me, Li, but found among no other Apache groups, bespeak the lack of distinctiveness of these 4 Apache groups as compared with 5 W Apache with 23 unique traits found among no other Apache.

16 Chiricahua (WS, Hu) elements were found common to the two groups but among no other Apache groups. This number exceeds the unique Jicarilla Apache (Ll, Ol) elements by 2, but it should be observed that certain of them were not inquired about among the W Apache and are doubtful among other Apache. In view of this, it is probably fair to say that the Chiricahua differentiation from other Apache is about the same as the Jicarilla differentiation, and both are weak compared with the W Apache. In the case of the Chiricahua this is quite expectable on account of their central position between the W Apache and the Mescalero.

Mescalero culture yields 38 peculiar elements. However, the list is not wholly satisfactory as some were not inquired about among the W Apache, WS, and Hu. This deficiency is due to certain of the elements being encountered only for the first time among the Me. It was then possible to inquire about them among Li, Ll, and Ol, but not among the Apache groups already visited.

Some idea of the extent of probable Plains influence in Me culture may be gained by examining the 47 positive traits shared with Li, but with no other Apache. There are no instances of shared peculiar absences. Some of the items are not specifically Plains traits and may be local specializations.

Li are usually reckoned as Plains Indian in culture and they certainly seem that more than they do Southwestern. They possess 21 positive specialties which are absent in the 10 other Apache groups investigated. Li negative specialties outnumber the positive and total 31; they comprise items present in the 10 other Apache groups but absent in Li. The cultural position of Li is perhaps better indicated by the list of typical Apache traits that are absent than by the Li positive specialties. Thus, absence of metate, grass brush, pitched water basket, coiled trays, basketry as woman's art, parent-in-law taboo, curing as shaman's chief business, etc., all strengthen the un-Southwestern aspect of Li culture. Some elements which give it a definitely Plains aspect are presence of tipi, slat back rest, buffalo hunt, bull boat, etc., and absence of basketry. In short, the Li seem a marginal Plains group with some marginal specializations, rather than a marginal SW group.

<sup>12</sup>Castetter and Opler, p. 9.

Jicarilla Apache Elements

The two Jicarilla groups (L1, O1) have 14 shared positive elements found among no other Apache. Like Li, the Jicarilla are perhaps best characterized negatively. 73 elements common to the other 9 Apache groups investigated are lacking among L1 and O1. In spite of this the Jicarilla were perhaps less definitely Plains in their type of culture than the Li, who had certain typical Plains traits which the Jicarilla lacked: slat back rest, bull boat. Many of the typical Apache traits lacking among the Jicarilla are apparently absent because of different environment and far northeastern position.

Opler<sup>13</sup> says of the 2 Jicarilla bands: "The difference between the two bands was no more than a matter of geographic location. Informants attest that no cultural or linguistic differences between the two bands existed." Perusal of the element list, however, reveals 334 differences between L1 and O1, at least according to my informants, O1 having 144 elements lacking in L1, and L1 having 190 lacking in O1. That all of these alleged differences are errors on the part of my informants seems unlikely in view of the different habitats of the 2 groups.

Of the 144 elements present in O1 and lacking in L1, with one exception (253) all are found with other SW groups, as follows: WS 99, Me 95, Hu 94, Li 90, SC 82, WM 82, Ci 81, EN 74, NT 73, ST 73, SI 67, Zu 57, SA 57, WN 54, HP 52 (actually 15), Wa 51, KP 49, SU 41. This listing puts other Apache groups in the first 7 places, EN 8th, WN 14th, and SU 18th.

Of the 190 elements present in L1 and lacking in O1, 13 are unique to L1, the balance of 177 found among other SW groups, as follows: HP 112 (actually 32), Zu 93, EN 92, Hu 87, SI 85, Ci 80, Me 78, NT 77, WS 76, Li 76, WN 73, ST 73, SC 73, WM 67, Wa 67, SA 63, KP 62, SU 59. Disregarding the hypothetical figure for HP, L1 shares most with Zu and EN, Hu has 3d place, SI 4th, then a series of 5 Apache groups, followed by WN, ST, and SC with 73 sharings. The figures therefore indicate that the two most potent influences on L1 were non-Apache in contrast to the strong Apache influences on O1. Assuming that the L1-O1 local differences are real, the above-mentioned figures seem to point to the probable cause of the differences.

Southern Ute Elements

Twenty-five unique positive elements were found in the SU group visited (Wemenuis). No doubt these occur in other Ute and Paiute groups, but I did not find them in any Southwestern groups, so they serve to characterize SU as rather un-Southwestern in culture. Moreover, SU lack a vast number of elements which occur in various SW groups, as examination of the element list will show. No doubt they should be regarded as Great Basin rather

than Southwestern in their cultural affiliations. The extent of their relationships with various SW groups is shown in the statistical analysis.

The following are the unique positive SU elements: 265, fork-ended pole for gathering; 288, rawhide "basket" with 2 U-sticks on outside; 335, Spanish bayonet yucca flowers eaten; 505, only exceptional families farmed; 741, fireplace near door of hut; 1181, quiver strap over both shoulders; 1655, white clay on exterior of basket water bottle; 1683, soft juniper-bark cradle, replaced monthly; 2005, ring-and-pin game played by men, 2006, played with one "pin," 2007, played with rabbit skull; 2127, clay balls for juggling; 2217, bull-roarer to stop snow; 2251, pictographs made; 2275, falling stars are star excrement; 2301, sky female; 2303, earth male; 2363, navel cord deposited in cave after 2 or 3 years; 2396, no meat for new father; 2434, girl in special hut at 1st menses; 2517, bridegroom's mother presents clothes to bride; 2596, cremation of dead; 2597, corpse at full length; 2598, funeral pyre; 2599, ashes of dead not touched.

Further indication of the un-Southwestern character of SU culture are 5 positive elements shared by SU and only one other group (indicated parenthetically): 445a, number of stone pot rests, 4 (L1); 750, wind screen(s) built out from door (WN); 904, porcupine tail for hairbrush (EN); 2340, parturition in specially built hut (KP); 2435, girl secluded during 1st menses (Wa). Element 2340 is shared with remote KP. The other 4 are shared with virtual neighbors of the SU and may have been diffused directly. Even the SU-KP shared element may hark back to an ancient common source, since this particular trait is widespread on the continent even though its distribution is not continuous.

Although a large number of elements which occur in the SW are absent among the SU, there are only 9 of these that are everywhere present in the SW except among SU. These are listed in the section on Universal Elements. The most striking absences are perhaps the sling, burial, and pottery making. SU were completely parasitic in their use of pottery, employing vessels from the ancient Pueblo ruins in their territory.

16 elements lacking among SU and only one SW group link SU as follows: with EN 2, ST 1, Ci 1, Hu 4, L1 1, Wa 3, Zu 1, KP 3. Apparently no particular significance attaches to these. Perhaps the 4 SU-Hu absences are due to the primitiveness of the 2 groups; 3 of the 4 elements refer to the dog. The 3 SU-KP absences might be attributable to marginal positions. The 3 SU-Wa absences seem hardly due to either contiguity or Shoshonean speech; in fact two of the elements refer to burial which Wa practice and SU do not. Perhaps the chief virtue of this paragraph is to indicate the futility of attempting to explain resemblances too precisely in terms of cause and effect, especially when the resemblances are negative and as randomly distributed as are these 16.

<sup>13</sup>1936, p. 203.

Pueblo Elements

Considering that 212 elements of social organization and religion were not inquired about among either Pueblo or Navaho, the aggregation of 39 peculiar elements common to the four Pueblos but absent from all other groups investigated, is imposing in number at least, although 19 concern houses. As I pointed out in the section on Characterization of Blocks of Tribes, the number of unique elements in a block or cluster is usually in inverse ratio to the number of groups in the cluster. Consequently, it is surprising to find that the unique (in SW) elements for the 4 Pueblos together exceed the number of unique (in SW) elements for the 4 individual Pueblos: Wa 17, Zu 21, SA 5, SI 24. This is no doubt indicative of a homogeneous, closely knit foundation for Pueblo culture in general, in spite of the local elaborations discussed beyond.

26 elements were found to be peculiar in 3 out of 4 Pueblos and absent in all other SW groups investigated. These were recorded as lacking in the following Pueblos: Wa 13, Zu 4, SA 5, SI 4. Perhaps the remote NW position of Wa accounts for the absence of half of these 26 typical Puebloan traits. Regarding these 26 unique elements found in 3 out of 4 Pueblos as peculiarly and typically Puebloan, it brings the total of unique Puebloan traits to 65, and serves to characterize Pueblo culture generally, since Shoshonean, Zunian, Keresan, and Tanoan are represented.

82 of the Wa specialties are shared with from 1 to 13 non-Puebloan groups, as follows: EN 42, WN 36, ST 35, NT 34, SC 34, WM 34, WS 33, Ci 32, Me 31, Hu 28, KP 26, Li 24, SU 20, Ll 15, Ol 11, HP 7 (actually 2). Naturally, it is impossible to say to what extent Wa has absorbed elements from these groups or vice versa. That Wa was once more like non-Puebloan groups and has been weaned over to Puebloan standards is by no means assured. The situation may be just the reverse, viz., that Wa was once more like the other Pueblos than now, and that isolation has allowed the absorption of non-Puebloan traits.

95 Zu specialties are found among 1 to 15 of the non-Puebloan groups investigated. The sharing is as follows: EN 47, Hu 41, NT 39, WS 39, WN 36, WM 36, Me 34, Ci 32, ST 31, SC 30, HP 28 (actually 8), Li 27, SU 24, Ll 23, KP 18, Ol 13. The high number of traits shared with noncontiguous Hu and NT is puzzling. However, near-by WN, EN, WM, and WS are high, EN topping all with 47. These are expectable. Again, it is impossible to say with assurance whether the drift has been from or to Zu, probably both.

The two Rio Grande Pueblos investigated were respectively Keresan (SA) and Tanoan (SI). These two share 82 elements lacking among Zu and Wa. 73 of these occur among 1 to 16 non-Pueblo tribes of the SW. These specialties link Rio Grande Pueblos more strongly with E Apache than with Navaho as the following enumeration of shared traits in descending order indicates: SA and SI

jointly share with Me 51, Li 41, WS 40, Hu 35, SC 33, EN 33, WM 29, ST 27, Ci 27, KP 27, Ll 26, Ol 25, WN 23, NT 22, HP 21 (actually 6), SU 18 elements. This sharing of specialties so largely with Apache groups contrasts with the condition for Wa and Zu in which the highest sharing of specialties is with the Navaho. This same situation is revealed in those elements peculiar to SA and SI separately and found among none of the other 3 Pueblo groups investigated, but found among certain non-Puebloan groups. The aloofness of SU with only 18 Rio Grande Puebloan specialties is made all the more conspicuous by the distant KP possessing 27 of the Rio Grande Puebloan specialties.

46 SA specialties (other than 5 uniques) are shared as follows with 1 to 15 non-Puebloan SW groups: WS 21, WM 20, Hu 19, Li 19, WN 19, NT 17, ST 17, Me 17, SC 15, Ci 15, EN 15, SU 10, HP 10 (actually 3), KP 9, Ll 5, Ol 4. WS and WM exceed the Navaho in sharing SA specialties. Why WN exceeds nearer EN is not apparent. Distant KP has more SA specialties than have near-by Ll and Ol. These latter two seem to have shared very few Puebloan specialties, except with SI, as attested by preceding Wa, Zu, SA-SI lists. SU, as in preceding Puebloan lists of specialties, ranks low.

As with those joint specialties shared by SA-SI, SI has most of its 108 shared specialties with two E Apache groups, viz., Me and Li. The resemblances with KP exceed those with SU, again demonstrating the non-SW character of SU culture. Disregarding partially investigated HP, we find the two Navaho groups (WN, EN) far down the list of groups sharing SI specialties: Me 60, Li 54, WS 41, SC 39, Ci 39, NT 38, Hu 38, WM 36, ST 34, Ll 32, EN 29, KP 27, WN 26, Ol 26, SU 22, HP 21 (actually 6). It seems very apparent that geographic position must be an important factor in bringing about sharing of W Pueblo traits with the Navaho and of E Pueblo traits with the Apache. Thus fishing by SI, Me, and Li is a trait environmentally conditioned by these groups having access to the Rio Grande. However, that one should not push geographic-contiguity explanations too far is indicated by the continuous low rank of SU in spite of propinquity to Navaho, Jicarilla, and Puebloan groups.

Papago Elements

As a complete element list was not obtained from HP, I have rounded out the list of unique Papago elements by counting certain KP traits which were not inquired about among the HP and vice versa. The total list of 74 unique traits, not found elsewhere in SW, seems unexpectedly small considering the marginal position of the Papago in relation to the other groups worked in 1935. Besides the 74 unique traits lacking elsewhere in the SW, 6 elements not inquired about anywhere in the SW were volunteered by Papago informants. Inasmuch as the Papago groups were the last worked, I had no opportunity to test the occurrence of these 6

elements elsewhere: 35, pit trap sprung by quarry; 165, sleep-inducing powder for deer; 423, scratching stick for head on salt expedition; 473, bird-nest-weave storage baskets; 1641, coiled basket for serving saguaro wine; 2733, hair war trophies made into effigies.

Eleven elements widely distributed in the SW were lacking among the Papago: 336, yucca (Spanish bayonet) root stalk for soap; 364, piñon seeds gathered from ground; 467, fat mixed with pulverized venison; 965, awl for skin sewing; 1459, hard-soled moccasins; 1546, pack strap across shoulders, chest; 1718, belt (lashing) of buckskin; 1753, 1-"ply" sinew thread for skin sewing; 2508, chose own mates in marriage; 2563, joking relations; 2683, undestroyed property inherited.

Concluding Remarks

The result of the preceding "qualitative" analysis is to largely support current opinions as to the relationships of various groups. Thus, SU is a Great Basin group little affected by the Southwest and affecting its nearest Southwestern neighbors, the Navaho, but scantily. The Western Apache stand out as not at all acculturated to Plains culture pattern, while their eastern relatives are increasingly so acculturated the farther east one goes. Li is definitely a Plains rather than a Southwestern people, while the Jicarilla (Ll, Ol) are less readily pigeonholed as either Southwestern or Plains. The Navaho appear much more strongly tintured with Pueblo traits than do the Apache, yet even so they have a fair number of specialties which set them off from other Athabascans and Southwesterners.

The Puebloan groups have an extensive common foundation of unique elements. Each of the four Pueblos visited has its set of unique or distinctive elements, San Ildefonso being outstanding in this regard. Wa and Zu share many of their specialties with the Navaho, while the two Rio Grande Pueblos, Santa Ana and San Ildefonso, share theirs mostly with the Eastern Apache. The Papago turn out to be fairly rich in unique traits, but not as rich as my impression when actually working with them. This means that they are to be regarded as Southwestern in culture; however, the statistical analysis should be consulted for their precise position in relation to the 18 other groups investigated.

Comparison of the results of my so-called qualitative analysis with those derived from Kroeber's quantitative or statistical analysis beyond reveals the greater accuracy and dependability of the latter. The "qualitative" analysis is based on a selection of universal elements, unique elements, and special elements characterizing blocks of tribes. In this respect it is comparable to the nonstatistical discussions in various earlier ethnological works, and has a corresponding value in pointing out the conspicuous features of each culture. But as for getting down to the complete

relationships existing between each pair of tribes, it fails just as signally. Only an analysis that takes account of every recorded item, whether positive or negative, can present the complete interrelationships. This the statistical analysis does, so that degree of relationship within each pair of tribes is definitely presented.

Summary of Universal and Special Elements

Southwestern universals (in 19 groups) ...	60
Athabaskan universals (in 13 groups) .....	161
Apache universals (in 11 groups) .....	159
Western Apache specialties (in 5 groups) .....	23
Other Apache specialties (in 6 groups) .....	11
Jicarilla Apache specialties (in 2 groups) .....	14
"Eastern" Apache specialties (in 4 groups) .....	7
Chiricahua Apache specialties (in 2 groups) .....	16
Mescalero Apache specialties (in 1 group) .....	38
Lipan Apache specialties (in 1 group) .....	21
Navaho specialties (in 2 groups) .....	69
Southern Ute specialties (in 1 group) ...	25
Pueblo specialties (in 4 groups) .....	39
Walpi specialties (in 1 group) .....	99
Zuni specialties (in 1 group) .....	116
Rio Grande Pueblo specialties (in 2 groups) .....	82
Santa Ana specialties (in 1 group) ...	51
San Ildefonso specialties (in 1 group) .....	132
Papago specialties (in 2 groups) .....	74

The quantitative or statistical analysis presents only the interrelations of the 20 tribal groups or territorial entities that were investigated. The interrelations, or degree of "adhesion," of elements, leading to definition of cultural strata or complexes, and the interrelation of these to the territorial and linguistic groupings is not attempted. The study of cultural strata or complexes in the various tribal cultures in the Southwest can be best undertaken when the element-list survey is completed.

In conclusion, I should like to call attention again to the utility and precision of statistical analysis as a tool for working out cultural interrelations when the data are sufficient, i.e., when absences as well as presences are recorded. By statistical analysis the exact degree of interrelationship can be accurately stated. The mass of detail in the discussion of individual elements can thus be summarized in a single figure, so that the mind can grasp the relative degree of relationship at a glance.

## STATISTICAL ANALYSIS

By A. L. Kroeber

Of the 2990 elements listed, 2636 are included in the quantitative or statistical analysis on the basis of having been inquired about among more than half of the tribes investigated. The remaining 354 elements are not included in the quantitative analysis. Table 1 shows the number of presences, absences, and blanks recorded for each tribe among the 2636 elements. The presences (pluses) range from 24 per cent among the marginal Ollero Apache to 47 among the centrally situated Warm Springs Chiricahua Apache. In other words, only from one-quarter to one-half of the traits inquired about in most groups were recorded as present in any one group.

However, it should be remembered that for tactical reasons no inquiry about society and religion was made among Navaho and Pueblos. Had these fields been included, presences would have been more numerous for Navaho and Pueblos, through the addition of elements not in the list as it stands; but the percentage of presences would presumably have been even lower for all other groups, on account of their lacking in toto a whole series of Pueblo rituals, etc.

TABLE 1

Group	Traits Present and Absent				%+
	+	-	Blank	Total	
WN	826	1032	778	1858	44.4
EN	1054	1363	219	2417	43.6
NT	983	1302	351	2285	43.0
ST	981	1219	436	2200	44.5
SC	1002	1348	286	2350	42.6
Ci	1007	1392	237	2399	41.9
WM	986	1437	213	2423	40.7
WS	1167	1328	141	2495	46.7
Hu	1077	1455	104	2532	42.5
Me	1176	1361	99	2537	46.3
Li	963	1617	56	2580	37.3
Ll	688	1880	68	2568	26.8
Ol	614	1958	64	2572	23.8
SU	597	1834	205	2431	24.9
Wa	856	1550	230	2406	35.5
Zu	969	1445	222	2414	40.1
SA	880	1511	245	2391	36.8
SI	1022	1393	221	2415	42.3
KP	877	1676	83	2553	34.3
HP	336	456	1844	792	42.5

Coefficients of resemblance.—Tables 2 and 3 give respectively coefficients ( $Q_s$ ) and percentages ( $W$ ) of similarity between each two of the 20 groups investigated.<sup>14</sup> Formula  $Q_s$  (table 2) possesses the practical advantage that its co-

<sup>14</sup>  $Q_s = (ad-bc)/(ad+bc)$ , where  $a = ++$ ,  $b = +-$ ,  $c = -+$ ,  $d = --$ . Results run from 1.0 to -1.0.  $W = (a+d)/(a+d+b+c)$ , that is, the sum of positive and negative agreements shown by any two groups, divided by the sum of agreements and disagreements. The resulting figure is a percentage, and of course never negative. When  $a, b, c, d$  are equal,  $Q_s = 0$ , but  $W = .50$ .

efficients have the greater spread: in this instance from 6 to 95, as against 53 to 88 for  $W$  (table 3).<sup>15</sup>

At the risk of unorthodoxy, mean coefficients for each tribal group have been added at the foot of tables 2 and 3. These means are highest for four centrally located Apache groups: Warm Springs and Huachuca Chiricahua, and White Mountain and Southern Tonto. They are definitely lowest for the Papago; next lowest for the Pueblos. They are lower for the Navaho than for all Apaches except Lipan and Ollero. For cultural classification, these values have little significance. Essentially they reflect the fact that two-thirds of the lists were secured from Athabascans and more than half from Apaches. Had 13 Pueblos been visited and only four Athabascan groups, the Pueblo coefficient means would presumably have been the higher. The result is to reemphasize that the frame of reference of the study is not so much generic Southwestern as Southwestern with a strong Apache bias.

Rank-order diagrams.—For the sake of completeness, tables 2 and 3 have been expressed in rank-order diagrams (diagrams 1, 2) as well as by the more usual and significant symmetrical ones (diagrams 3, 4). Both the  $Q_s$  and the  $W$  rank-order diagrams display for the Navaho strong Walpi and Zuni connections; both give second rank to Northern Tonto in the Western Navaho column, second rank to Zuni in the Eastern Navaho column. The five Western Apache groups (NT, ST, SC, Ci, WM) appear as a homogeneous block, with the first three rankings for each within the square formed by the five, viz., all highest ranks are internal in both diagrams. "Eastern" Apache (WS, Hu, Me, Li) is less sharply outlined as a block than Western Apache, in both diagrams. The Chiricahua Apache (WS, Hu) give White Mountain third place in both figures, evidencing a considerable affiliation. Lipan gives Ollero third rank in both figures. The  $W$  diagram indicates that Llanero, Ollero, and Southern Ute form a cultural group, as each has its two closest connections with the other two. The  $Q_s$  diagram gives the two Jicarilla bands first rank from the point of view of Southern Ute, but both Llanero and Ollero give second rank to Lipan instead of to Ute. This special Jicarilla-Lipan relationship suggests common participation in Plains culture. The Jicarilla-Ute relationship is due rather to proximity, and seems one-way: the Ute took much from the Jicarilla, but the Jicarilla remained Apaches above all.

In both diagrams 1 and 2 the block of four Pueblos (Walpi, Zuni, Santa Ana, San Ildefonso) is as impressive and homogeneous as the Western Apache block. One disagreement as to first rank

<sup>15</sup> Not only are decimal points omitted in table 2, but in the discussion that follows  $Q_s$  coefficients are cited as percentages.

TABLE 2

Q<sub>e</sub> Coefficients of Likeness on 2636 Elements  
(Decimal points omitted)

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
WN		845	621	549	511	535	550	520	479	458	297	453	517	560	551	540	477	487	275	139
EN	845		524	548	479	500	483	439	424	339	263	456	511	572	566	660	440	484	234	181
NT	621	524		907	863	859	826	676	649	545	408	361	402	452	216	264	187	221	248	203
ST	549	548	907		900	872	910	754	706	567	523	368	473	494	237	230	213	253	320	224
SC	511	479	863	900		872	890	766	763	616	502	352	481	398	199	129	166	220	332	364
Ci	535	500	859	872	872		949	784	754	613	473	452	485	468	224	171	169	216	349	165
WM	550	483	826	910	890	949		806	795	552	499	386	482	438	222	199	227	232	328	256
WS	520	439	676	754	766	784	806		910	842	741	458	621	494	252	190	285	295	331	255
Hu	479	424	649	706	763	754	795	910		834	788	560	640	583	352	080	129	131	271	171
Me	458	339	545	567	616	613	552	842	834		873	598	736	542	204	171	405	376	294	244
Li	297	263	408	523	502	473	499	741	788	873		640	748	495	150	114	238	265	162	128
Ll	453	456	361	368	352	452	386	458	560	598	640		949	594	367	410	398	497	187	060
Ol	517	511	402	473	481	485	482	621	640	736	748	949		600	449	453	478	547	203	204
SU	560	572	452	494	398	468	438	494	583	542	495	594	600		350	372	491	329	265	135
Wa	551	566	216	237	199	224	222	252	352	204	150	367	449	350		774	753	773	328	460
Zu	540	660	264	230	129	171	199	190	080	171	114	410	453	372	774		831	756	234	279
SA	477	440	187	213	166	169	227	285	129	405	238	398	478	491	753	831		865	357	246
SI	487	484	221	253	220	216	232	295	131	376	265	497	547	329	773	756	865		348	381
KP	275	234	248	320	332	349	328	331	271	294	162	187	203	265	328	234	357	348		913
HP	139	181	203	224	364	165	256	255	171	244	128	060	204	135	460	279	246	381	913	
Av	493	471	496	529	516	522	528	548	527	516	437	450	525	454	391	361	387	404	315	263

TABLE 3

W Percentages of Similarity for 2636 Elements

	WN	EN	NT	ST	SC	Ci	WM	WS	Hu	Me	Li	Ll	Ol	SU	Wa	Zu	SA	SI	KP	HP
WN		77.7	69.1	65.4	64.3	64.9	65.4	64.4	63.4	62.6	58.4	62.1	63.2	64.5	65.4	65.0	63.2	63.4	58.1	54.4
EN	77.7		64.6	65.3	63.3	63.9	63.5	61.7	61.6	58.9	57.7	62.4	63.3	65.0	66.2	69.1	62.5	63.5	57.5	56.0
NT	69.1	64.6		82.0	79.0	78.5	76.6	69.7	69.0	65.1	61.7	60.5	61.5	62.8	56.9	57.4	56.2	56.3	57.8	55.6
ST	65.4	65.3	82.0		81.3	79.3	82.1	73.0	71.8	66.4	64.5	60.0	62.3	62.9	57.1	56.4	56.5	57.0	59.2	56.2
SC	64.3	63.3	79.0	81.3		79.6	80.9	73.5	73.7	67.6	64.5	60.6	63.3	61.3	56.8	54.2	56.0	56.6	60.0	60.1
Ci	64.9	63.9	78.5	79.3	79.6		86.3	74.2	73.2	67.4	63.7	63.9	63.8	63.4	57.7	55.4	56.2	56.5	60.7	54.7
WM	65.4	63.5	76.6	82.1	80.9	86.3		75.2	75.3	65.1	64.7	62.2	64.6	63.6	57.8	56.2	57.7	57.0	60.1	57.5
WS	64.4	61.7	69.7	73.0	73.5	74.2	75.2		81.9	77.4	71.4	61.1	64.5	61.7	56.8	55.1	57.6	57.8	58.7	56.8
Hu	63.4	61.6	69.0	71.8	73.7	73.2	75.3	81.9		77.0	74.6	65.6	66.3	65.7	58.6	53.1	55.0	54.3	58.4	55.9
Me	62.6	58.9	65.1	66.4	67.6	67.4	65.1	77.4	77.0		78.1	64.7	67.7	63.0	55.7	54.8	60.6	60.0	58.0	57.1
Li	58.4	57.7	61.7	64.5	64.5	63.7	64.7	71.4	74.6	78.1		70.1	73.3	66.5	56.7	54.5	58.5	58.1	57.4	55.5
Ll	62.1	62.4	60.5	60.0	60.6	63.9	62.2	61.1	65.6	64.7	70.1		87.9	73.0	63.7	62.1	64.1	64.1	60.8	64.9
Ol	63.2	63.3	61.5	62.3	63.3	63.8	64.6	64.5	66.3	67.7	73.3	87.9		74.0	66.1	63.9	66.0	64.8	62.1	58.0
SU	64.5	65.0	62.8	62.9	61.3	63.4	63.6	61.7	65.7	63.0	66.5	73.0	74.0		63.6	61.2	67.6	60.5	62.7	56.2
Wa	65.4	66.2	56.9	57.1	56.8	57.7	57.8	56.8	58.6	55.7	56.7	63.7	66.1	63.6		73.6	74.2	73.4	61.9	63.1
Zu	65.0	69.1	57.4	56.4	54.2	55.4	56.2	55.1	53.1	54.8	54.5	62.1	63.9	61.2	73.6		77.3	73.3	57.8	58.1
SA	63.2	62.5	56.2	56.5	56.0	56.2	57.7	57.6	55.0	60.6	58.5	64.1	66.0	67.6	74.2	77.3		78.9	62.4	57.7
SI	63.4	63.5	56.3	57.0	56.6	56.5	57.0	57.8	54.3	60.0	58.1	64.1	64.8	60.5	73.4	73.3	78.9		60.6	60.9
KP	58.1	57.5	57.8	59.2	60.0	60.7	60.1	58.7	58.4	58.0	57.4	60.8	62.1	62.7	61.9	57.8	62.4	60.6		82.6
HP	54.4	56.0	55.6	56.2	60.1	54.7	57.5	56.8	55.9	57.1	55.5	54.9	58.0	56.2	63.1	58.1	57.7	60.9	82.6	
Av	63.9	63.4	65.2	66.2	66.1	66.4	66.9	65.9	66.0	64.5	63.7	64.4	66.1	64.1	62.3	60.9	62.5	61.9	60.8	58.4

appears: according to Q<sub>e</sub> Walpi shows its closest affinity with Zuni, but according to W with Santa Ana. This indicates closeness of relationship of Walpi to both.

The two Papago lists differ from each other

somewhat in detail of external relationship in the two figures, probably because one of them is only a fragment. However, they agree in confining their higher similarities to Pueblos and Western Apache; plus Ollero and Southern Ute for W coefficients.

Symmetrical diagrams.—The most significant diagrams are 3 and 4, which simply express graphically by shaded symbols the numerical values of tables 2 and 3 as grouped into blocks. They have deliberately been drawn so as to give somewhat different effects.

Diagram 3, based on  $Q_2$  values, indicates only those two-fifths of the coefficients which are the highest. The primary relationships are thus accentuated.

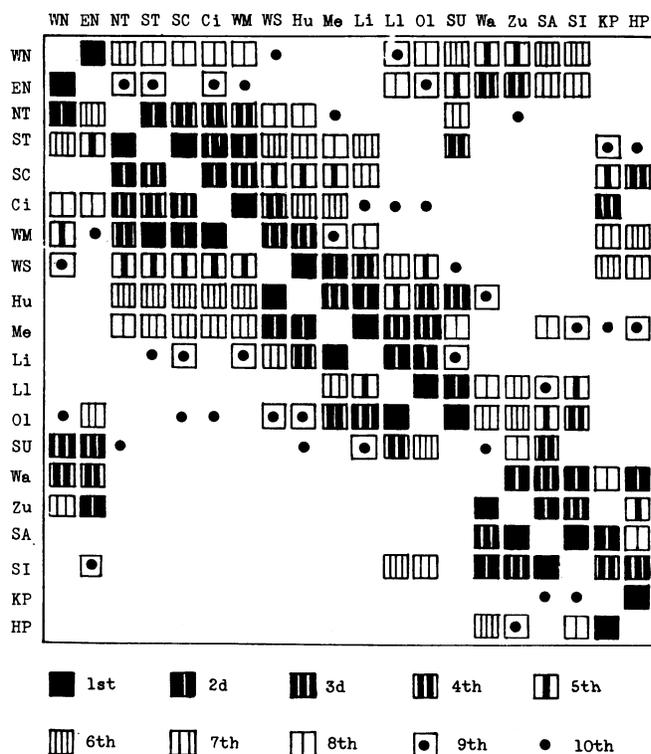


Diagram 1. Vertical ranking of  $Q_2$  coefficients, 2636 elements.

Diagram 4, on the contrary, shows seven-tenths of all  $W$  coefficients. The blanks are therefore the most significant feature; although the solid black symbols indicative of highest similarity are distributed almost exactly as in the  $Q_2$  diagram.<sup>16</sup>

The highest frequency of blanks—the lowest three-tenths of all percentages encountered, below 60 by formula  $W$ —occurs, according to diagram 4, for the Papago. Next frequent in low values are the Pueblos, who generally show values under 60 with all Athabascans except Navaho and Jicarilla.

<sup>16</sup>The dotted squares must not be compared. They mean quite different things: in diagram 3, the coefficients of rank order 46 to 70 (viz., of 190, 45 are higher, 120 lower); in diagram 4, of rank order 69 to 129 (61 are higher, 61 are lower).

The 13 Athabascan groups, on the contrary, are all intrarelated above 60, with the exception of Navaho with Mescalero and Lipan. There is thus a definite Athabascan cultural block in the Southwest, although two portions of it have also acquired specific Pueblo resemblances.

Analysis of  $Q_2$  values.—A more intensive interpretation of the  $Q_2$  coefficients compiled in table 2 and diagram 3 follows. In regard to the "Southwestern" character of this interpretation, it

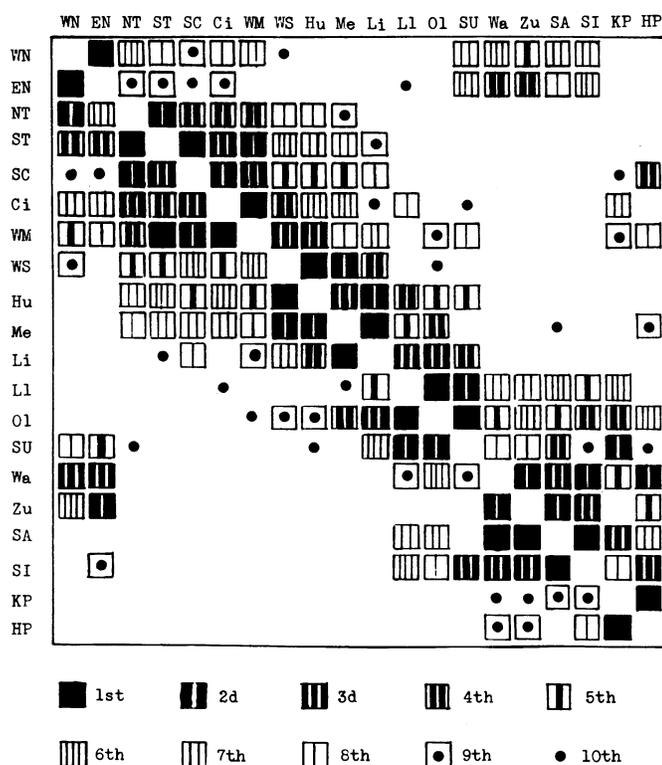


Diagram 2. Vertical ranking of  $W$  coefficients, 2636 elements.

should be remembered that the groups investigated include only 4 Pueblos, but 13 Athabascan tribes or bands; 2 Papago divisions but no Pima; and one group of Southern Ute, usually reckoned as of Great Basin affiliation; and no Yumans.

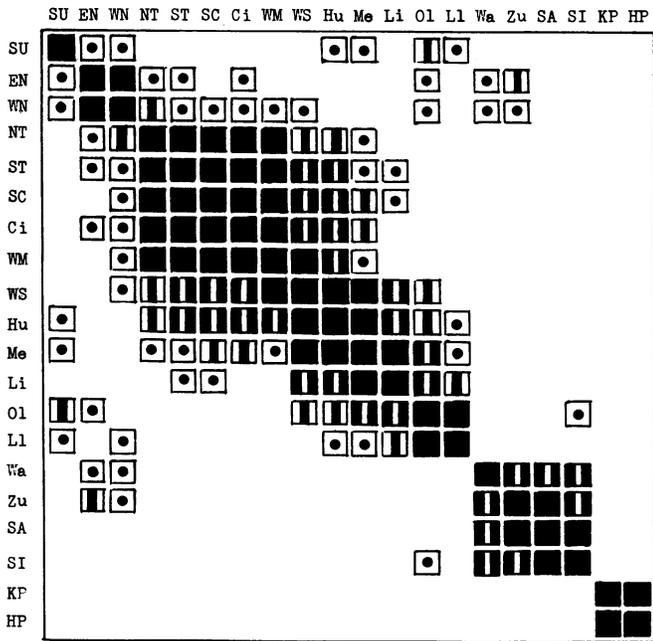
Pueblos.—The four Pueblos form a well-marked unit, with internal coefficients from 75 to 86. The coefficients would undoubtedly have been higher but for the fact that the four Pueblos were selected to represent the separate linguistic stocks involved. In other words, they were chosen for spread. There are higher coefficients in the  $Q_2$  table, but they are between what are usually considered bands within tribes, like Eastern and Western Navaho, Northern and Southern Tonto, San Carlos and White Mountain Apache, Llanero and Ollero Jicarilla. Had correspondingly

close Pueblos been chosen for inquiry—say Walpi and Oraibi, Sia and Santa Ana—coefficients well in the 90's would presumably have been obtained.

Among the Pueblos, Santa Ana and San Ildefonso, both in the Rio Grande valley, show the highest intercorrelation. Second are Zuni and Santa Ana—the latter nearer than San Ildefonso to Zuni, and special Zuni-Keresan relations having been frequently mentioned by all ethnographers dealing with the two peoples. The Hopi are clearly the

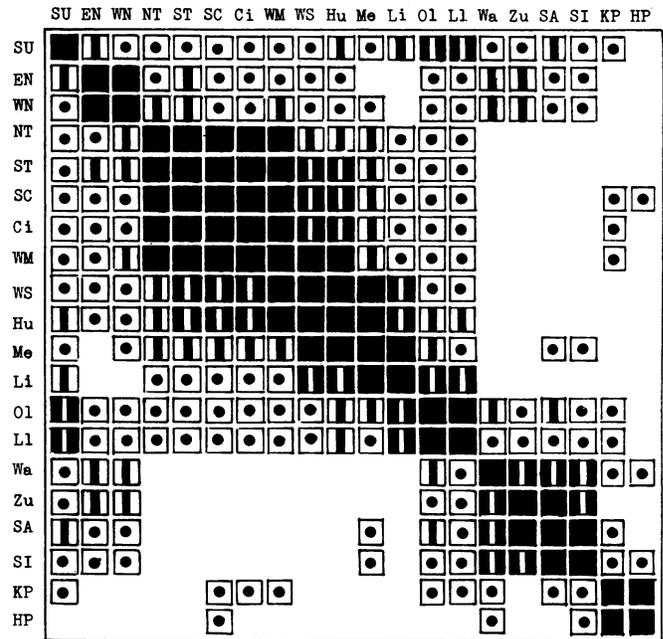
Western, "Eastern," and Northern Apache. Each of these deserves separate consideration.

Navaho.—The Eastern and Western Navaho correlate at 85—about the same as Zuni-Santa Ana or Santa Ana-San Ildefonso, Pueblos of different stock. This is certainly a surprising disparity to be obtained from members of what is considered one "tribe." It suggests that earlier ethnologists have served their convenience by ignoring consider-



■ 1.0-.80    ▤ .79-.70    ▥ .69-.60    ○ .59-.50

Diagram 3.  $Q_2$  higher coefficients, 2636 elements.



■ 1.0-.75    ▤ .74-.70    ▥ .69-.65    ○ .64-.60

Diagram 4. W higher percentage coefficients, 2636 elements.

most divergent Pueblo (except perhaps for Taos): the Second and Third Mesa towns would presumably diverge even more than First Mesa Walpi from the rest.

External relations of the Pueblos are most marked in two directions. One is Zuni and Walpi with Eastern and Western Navaho. The highest value is Zuni-Eastern Navaho 66. This no doubt reflects old interrelations, whose effects are still stronger than those of the recently active Hopi-Western Navaho relations. The other special relation is San Ildefonso-Ollero, between the northernmost of the Pueblos studied and the Jicarilla division farther away from the Plains and up the Rio Grande.

Athabascans.—Thirteen of our "tribes" are Athabaskan. These fall into four groups: Navaho,

able local differences within the Navaho. Some of the lack of higher coefficient may be due to Western Navaho furnishing the first list obtained, Eastern Navaho a later and fuller one; but no more than part of the result can well be due to this fact. Western Navaho shows its highest outside coefficient with Northern Tonto, 62; Eastern Navaho, with Zuni, 66. The latter has already been mentioned as indicative of old relations. The former reflects geographical position: the Northern Tonto are the nearest Western Apache to the Western Navaho.

Special Navaho-Jicarilla relations might be suspected on account of both tribes being northerly among the Southwestern Athabaskan, and, before the recent westward drift of the Western Navaho, near neighbors. Both Navaho divisions

show higher coefficients with Ollero than with Llanero Jicarilla. The Eastern Navaho, who remain geographically nearer to the Jicarilla, have their Ollero and Western Apache coefficients about the same; the Western Navaho have definitely higher Western Apache coefficients. As there appears to be little record of much intercourse in American times between Western Navaho and Western Apache, it is possible that these relatively high Western Navaho-Western Apache coefficients represent neighborly relations of a century and more ago, when the Navaho were still considered Apaches.

The following is also of interest. Eastern Navaho coefficients with 11 Apache groups average 45; Western Navaho 50. Even with the easterly Apache the Western Navaho show higher relationship; thus, with Huachuca 48, against Eastern Navaho 42; Mescalero, 46, against 34; Lipan, 30, against 26; contrary to geography. The Western Navaho have evidently remained more like the other Southwestern Athabascans—more like generic Apache, in short; the Eastern Navaho have changed away. Greater Pueblo influence is suggested; and this is confirmed by the coefficients: Eastern Navaho average with 4 Pueblos 54, Western Navaho 51. The Eastern Navaho actually average higher coefficients of similarity with the town-dwelling Pueblos (at least with cults and social structure omitted from consideration) than with their brother Apache groups.

Western Apache.—The five Western Apache divisions form a compact geographical block in Arizona and an equally compact block in the table and diagram. Their coefficients inter se all lie high: between 83 and 95. All five are obviously merely subdivisions of one people in one restricted area.

Easterly Apache.—It is otherwise with the "Eastern" Apache. Their four groups have lower internal coefficients: from 74 to 91. The two highest of these are Warm Springs-Huachuca 91 and Mescalero-Lipan 87. The Warm Springs and Huachuca are Chiricahuas, originally in or close to Gila drainage, like the Western Apache. The Mescalero centered in the Sierra Blanca and Guadalupe mountains, across the Rio Grande, 200 to 250 miles to the east. The Lipan were still further east and south in Texas and Coahuila, and are often included among the Plains Indians. It is inconceivable that tribes or bands as far-flung as these four should show much in common. In fact, the coefficients, though not of the highest, are probably too high for native conditions of a century or more ago. Why are they as high as they are? Evidently because the American government put the four groups on one reservation, where they have acculturated one to the other. The four cultures, or the memories of them, have assimilated. Our coefficients give a picture of relations not as they were in 1800, but of the relations of 1935, which are a composite of those of 1800, 1860, and a generation or so of joint and intermarried reservation life. If the element-list method is at

all sensitive—and to be of value it should be sensitive—it ought to reflect the effect of twenty years, more or less, of forced acculturation; as it does.

We may conjecture therefore that if our data really referred wholly to aboriginal, or at least pre-American, conditions, when the Chiricahua were still in Gila drainage and partly in Arizona, their coefficients toward San Carlos-White Mountain and Mescalero might have been reversed; that is, higher with San Carlos-White Mountain and lower with Mescalero.<sup>17</sup>

Pueblo relations confirm. The Warm Springs coefficient with Walpi (in Arizona) is 25 vs. Mescalero 20; with Santa Ana and San Ildefonso (in the Rio Grande valley) 28 and 29 vs. Mescalero 41 and 38.

<sup>17</sup>Dr. M. E. Opler doubts this. He points out that the Chiricahua were put on the Mescalero reservation only in 1913, and that a third of them are still in Oklahoma. He holds that the close cultural and linguistic relationship of Chiricahua and Mescalero is aboriginal; that only a short time, historically speaking, has elapsed since their separation; and that the Mescalero are an eastern offshoot from the Chiricahua (personal communication of May 22, 1937). His view fits the coefficients equally well; and his intimate knowledge must be deferred to. That would mean that the southwesternly Apaches consisted of two main divisions: one on middle Gila drainage, now known as Western Apache; and the second in upper Gila drainage, Chiricahua in the larger sense, from whom the Mescalero moved east across the Rio Grande in late historic times. But then who were the Apache east of that river before the Mescalero came in? And what has become of them? We evidently need badly a historic study identifying the various Apache tribes or bands under their Spanish and their American designations, with localization. And in any event, until the problem is definitively cleared up, I shall suspect some influence of the 22 years of common reservation life of Chiricahua and Mescalero between 1913 and 1935 to show in the coefficients. Whether the acculturation was actual and tribal, or only in the minds of Gifford's particular Chiricahua and Mescalero informants, the lists or coefficients themselves of course cannot show. The obverse situation exists for the Ollero and Llanero, whom Opler has treated as identical Jicarillas, whereas Gifford finds considerable differences. The truth probably lies between. Opler is interested in basic patterns and gets agreements; Gifford collected disparate items, which experienced elsewhere uniformly shows to vary locally to a surprising degree, though the historic significance and depth of the difference may be slight for each individual item alone. The approaches are distinct and therefore the findings differ; but they are not necessarily in conflict. For the Chiricahua, for instance, there is the outstanding agreement between Opler and Gifford that these upper Gila drainage Apaches, contrary to physiography, resemble more closely the Mescalero east of the Rio Grande than their fellow Apaches lower on the Gila. In contrast with this independently corroborated fact, Opler's and my somewhat varying explanations are of secondary importance; and I certainly do not wish to be dogmatic in the face of his first-hand experience.

From the point of view of two Apache divisions living in the Sierra Blanca east of the Rio Grande, these varying coefficients would be meaningless. They are good coefficients, historically and geographically, for the Mescalero who have long lived in the Sierra. They are also good enough coefficients for the Chiricahua, if we admit their recorded culture to be a blend of what they formerly had in Gila headwaters and what they since acquired among the Mescalero.<sup>18</sup>

The low figures for Zuni with the Chiricahua—19 and 8—probably mean that the Zuni had very little to do, in war or peace, with these Apache south of them across an empty malpais; but correspondingly much with the Navaho (66) and through them with the Jicarilla (41, 45) to the north.

Northern Apache.—The northern Apache, other than so far as the Navaho might be considered as such, are the two Jicarilla divisions: Ollero and Llanero. Opler has characterized the culture of these as identical; which must be construed as merely an approximative statement, in view of the difference in habitat and the presumably greater use of the plains by the Llanero; not to mention 334 disagreements in the two lists. However, the Ollero and Llanero were undoubtedly very similar. Their coefficient, 95, is, with Cibecue-White Mountain, the highest obtained in the Southwest. No other Jicarilla coefficient reaches 80; the highest are Ollero-Lipan 75 and Ollero-Mescalero 74. From these the Ollero coefficients with Apaches range down to Ollero-Northern Tonto 40. With the Navaho they are 51 and 52; with the Pueblos from 45 to 55 (this last with San Ildefonso, the northernmost and nearest); with the Southern Ute 60. These figures show that the closest external Jicarilla relations were with the Apaches east of the Rio Grande. Beyond that, distance counted for as much as ethnic relationship: The Pueblos average higher (49) than the Western Apache (46), the Shoshonean Ute (60) higher than the Athabascan Navaho (51). There was evidently a pretty strong Pueblo influence on the Jicarilla; stronger than Pueblo influence on any other Athabascan division, except Zuni on Eastern Navaho and perhaps Walpi on Western Navaho.

There is an unexplained but consistent difference of coefficients between the Ollero and Llanero divisions. The Ollero average 7.5 points higher, and are higher with every single tribe in the Southwest, Athabascan and other. Two explanations are possible. (1) The Llanero, more exposed to Plains influences, have thereby been warped away from all Southwestern culture. This is probably a fact to some degree; but in that

event the Llanero coefficient ought to be specially high with the only other "Plains" tribe here studied, the Lipan; whereas the coefficient is 11 points lower than that between Ollero and Lipan, 64 as against 75. (2) Difference in informants is also a possible cause. In that case, one would first suspect the Llanero informant to have been negativistic, denying a considerable number of elements actually present in his culture. This cannot well be, because while Jicarilla culture is clearly the most meager in the Southwest (except for Southern Ute), the Llanero informant gave 74 more positive answers than the Ollero, and 78 fewer negative ones. If the cause is unreliability in the lists, it must therefore lie in the distribution of positive and negative answers. Thus if the Llanero informant was irresponsible, ignorant, or incorrect, and often enough answered + when the fact was -, and vice versa, Llanero-non-Llanero disagreements would pile up, and coefficients be reduced. But Gifford noticed nothing in the informant's attitude, or in the character of his list, to confirm such an impression, even though he regarded both informants as grade B. One interpreter was used for both.

All in all, it seems that the lower Llanero coefficients are more likely due to something in the Llanero culture as compared with Ollero, than to something in the list-recording; and this factor can hardly be anything else than stronger Plains relations. The relatively low Llanero-Lipan coefficient of 64 is after all the highest outside coefficient which Llanero has, and probably bespeaks Plains influence on both Llanero and Lipan. The relative lowness of this coefficient may be due to the Lipan rather than the Llanero, the Lipan of today being nearly extinct, and merged as a tribe in the Mescalero, so that memory of their culture is no doubt more blurred. However, the average coefficient relations of Llanero and Lipan to the other 19 tribes are 45 and 44 respectively, while the Ollero average is 53. The figures 45 and 44 indicate Llanero and Lipan as the most aberrant Athabascans. They have presumably both departed from the Southwestern Athabascan norm toward the Plains Indian norm, but not in identical ways.

Ute.—The Southern Ute are the one group of the twenty usually reckoned as frankly non-Southwestern. They also furnished the smallest number of positive traits—597. Nevertheless, their coefficients run near the average; are higher, in fact, with most tribes, than those of the 4 Pueblos! This does not mean that the Ute are more "Southwestern" in culture than the Pueblos who are generally taken as typifying this culture, but that lists were taken from only 4 town-dwelling and from 16 less settled or "rancheria" tribes; and the Southern Ute being among the latter, would have 15 tribes out of 19 of like status with themselves, in comparisons, but the Pueblos each only 3 out of 19. In other words, the frame of reference and comparison is mainly non-Pueblo.

<sup>18</sup>Or, on Opler's view, both sets of coefficients would be good because the Chiricahua still retain original Chiricahua-Mescalero culture as it was east of the Rio Grande, while the present Mescalero culture is a blend of this plus Pueblo and perhaps Plains influences.

Another question that arises is how the Southern Ute can have fairly high coefficients when, with so few positive elements in their culture, the number of their positive agreements must also be limited. The probable answers are two. First, the Southern Ute evidently developed little of their own. They had only a meager culture, but most of that is also to be found somewhere else. Second, they lacked many elements—1834. But for every tribe more negatives than positives were recorded. Most of the Southern Ute 1834 minuses therefore must agree with minuses in other lists. In short, both as regards positive agreements (a) and negative agreements (d) the Southern Ute were fairly strong, and therefore their coefficients are fairly high. This situation is illustrated by imagining a tribe for which 1800 positive elements were recorded and only 600 negative ones. In the context of our twenty tribes with their prevailing absences of traits, this imaginary tribe would certainly run low coefficients throughout—probably mostly negative ones.

The fact which corroborates the established ethnographic opinion of the Ute as not being a Southwestern people, is that they do not show one coefficient of the first order of magnitude (above 80), nor of second order (above 70) in diagram 3. They have only one of third order, with Ollero, 60; and that barely so. The Ollero Jicarilla are the Southwestern tribe nearest to them. Next in coefficient value come the Llanero Jicarilla; then the Huachuca Chiricahua, it is not clear why; then the Eastern and Western Navaho, who are more northerly and therefore nearer the Southern Ute than any Apache other than the Jicarilla.

In short, the moderately high average of Southern Ute coefficients is statistically conditioned, at least in large measure, and means nothing; but the quite abnormal lowness of the Southern Ute highest coefficients is significant, and confirms the Southern Ute as belonging outside of the stricter Southwestern culture area. Their maximal relation, of third and fourth grade, they share with Athabascans only. Whether this is due to an original Great Basin type of Athabascan culture, or to more recent local diffusion, is not evident. Perhaps both factors are involved.

Papago.—An even lower set of correlations holds for our last people, the Papago. Here the highest coefficient for the full-list Kikimai division (the Huhula Papago list is only 2/7 complete) is no more than 36. In short, the Papago also come out "un-Southwestern," that is, markedly differentiated from the Pueblo-Navaho-Apache block of tribes. This is not surprising in view of the fact that they and the Gila Pima are but the northern outposts of a Piman nation which extends over four hundred miles southward, far into Mexico.

The highest Kikimai Papago coefficients, with a range between 32 and 36, pertain to two blocks of tribes. One of these consists of the five nearer Apache divisions: Southern Tonto, San Carlos, Cibecue, White Mountain, Warm Springs. The Northern Tonto are not among these, but the Warm Springs Chiricahua are. The second block consists of three of the four Pueblos (Zuni for some unexplained reason is abnormally low.) These three Pueblo coefficients average slightly higher than the Apache ones; but geographically the Pueblos are more remote. The interpretation would be that there was an old Papago-Pueblo relationship, not necessarily very close but of some historic depth; and that later the Western Apache intruded and their more recent but nearer relations with the Papago brought the similarity with them up nearly or about to the same strength.

Conclusions.—The following summary findings emerge from this review of the  $Q_e$  coefficients:

1. The Pueblos, an obviously well set-off culture group in spite of their internal speech diversity, show Zuni-Navaho as their closest external relation, Hopi-Navaho next, Tanoan-Jicarilla third.
2. Of the four Athabascan groups, Navaho, Western Apache, and Jicarilla constitute cultural subgroups of some historic depth.
3. The Navaho are far from uniform internally. The easterly and westerly Navaho differ more from each other than any of the five Western Apache "tribes" differ from one another. Navaho similarity to the westerly Pueblos is fully as great as to the most similar Apache, who are the Tonto.
4. The five Western Apache divisions form a very closely knit group.
5. The Jicarilla are more similar to the Eastern Apache than to the Western Apache or the Navaho. There are noticeable differences between their two divisions.
6. The Eastern Apache are an artificial group, composed of the Chiricahua, whose former affiliations with the nearer Western Apache may have been close; of the Mescalero; and of the Lipan far to the southeast. These three have been somewhat assimilated secondarily on the Mescalero reservation.
7. Even a brief generation of intertribal acculturation seems sufficient to be reflected in the coefficients.
8. Both Southern Ute and Papago fail to show strong similarities with any Pueblo or Athabascan group, and are therefore not "Southwestern" in the stricter sense. This holds even more for Papago than for Ute. Ute relations are per geography: strongest with the Jicarilla and Navaho. The Papago show at least as much similarity to the more remote Pueblos as to the nearest Western Apache.

## APPENDIX

### ABSOLUTE NUMBERS OF ELEMENTS SHARED AND NOT SHARED

By each pair of tribes, in the order: a,b,c,d (a = ++; b = +-; c = -+; d = --).

WN-EN	605	198	202	786	ST-Me	496	344	338	849
WN-NT	433	357	282	996	ST-Li	492	480	293	913
WN-ST	449	331	275	696	ST-Ll	349	620	248	953
WN-SC	412	376	258	728	ST-Ol	339	617	198	1008
WN-Ci	433	354	260	702	ST-SU	331	571	187	952
WN-WM	427	379	246	753	ST-Wa	390	528	363	797
WN-WS	476	330	314	689	ST-Zu	462	466	439	707
WN-Hu	423	380	286	730	ST-SA	395	519	386	781
WN-Me	452	340	336	679	ST-SI	468	463	433	719
WN-Li	366	452	307	700	ST-KP	414	538	339	856
WN-Ll	315	497	196	822	ST-HP	155	159	144	233
WN-Ol	293	516	156	863	SC-Ci	714	247	213	1080
WN-SU	300	469	148	821	SC-WM	723	247	193	1137
WN-Wa	431	371	252	749	SC-WS	707	275	336	984
WN-Zu	487	320	307	675	SC-Hu	654	328	289	1079
WN-SA	418	375	280	709	SC-Me	622	348	388	914
WN-SI	464	343	316	677	SC-Li	493	493	336	1014
WN-KP	344	450	307	706	SC-Ll	344	630	274	1047
WN-HP	120	125	162	223	SC-Ol	348	628	215	1107
EN-NT	557	391	366	823	SC-SU	317	610	226	1009
EN-ST	558	356	365	798	SC-Wa	373	530	400	850
EN-SC	534	414	382	840	SC-Zu	424	485	505	748
EN-Ci	548	425	373	867	SC-SA	370	523	422	834
EN-WM	531	447	364	878	SC-SI	442	467	474	784
EN-WS	600	399	473	806	SC-KP	427	541	375	947
EN-Hu	565	464	427	867	SC-HP	161	128	159	271
EN-Me	584	440	518	791	Ci-WM	791	172	145	1207
EN-Li	475	440	564	894	Ci-WS	727	253	347	996
EN-Ll	396	639	250	1080	Ci-Hu	682	308	331	1066
EN-Ol	369	663	203	1127	Ci-Me	634	341	420	940
EN-SU	375	591	184	1066	Ci-Li	485	504	349	1014
EN-Wa	522	480	307	1019	Ci-Ll	366	609	270	1190
EN-Zu	673	337	381	930	Ci-Ol	358	625	226	1139
EN-SA	487	513	353	955	Ci-SU	339	591	223	1072
EN-SI	576	450	406	912	Ci-Wa	381	513	416	884
EN-KP	404	612	387	945	Ci-Zu	436	476	511	788
EN-HP	141	155	176	284	Ci-SA	375	519	437	851
NT-ST	725	164	217	1012	Ci-SI	446	468	493	803
NT-SC	703	246	218	1040	Ci-KP	418	521	369	954
NT-Ci	694	279	198	1051	Ci-HP	156	169	156	236
NT-WM	667	316	213	1061	WM-WS	725	231	355	1050
NT-WS	644	311	364	909	WM-Hu	685	283	305	1104
NT-Hu	591	371	323	954	WM-Me	617	331	520	967
NT-Me	599	361	413	845	WM-Li	494	477	361	1044
NT-Li	458	510	350	927	WM-Ll	351	605	288	1121
NT-Ll	338	625	258	1016	WM-Ol	333	603	228	1180
NT-Ol	317	637	225	1061	WM-SU	318	576	238	1104
NT-SU	328	576	217	1009	WM-Wa	376	511	424	906
NT-Wa	389	517	397	819	WM-Zu	430	451	512	804
NT-Zu	468	458	449	755	WM-SA	390	479	438	886
NT-SA	384	513	408	796	WM-SI	446	452	501	815
NT-SI	456	469	462	744	WM-KP	410	539	399	1002
NT-KP	400	546	390	884	WM-HP	149	141	171	273
NT-HP	160	156	163	240	WS-Hu	868	279	168	1143
ST-SC	696	239	157	1027	WS-Me	840	291	258	1039
ST-Ci	663	263	171	995	WS-Li	670	477	227	1084
ST-WM	726	224	158	1032	WS-Ll	418	718	232	1073
ST-WS	657	289	286	897	WS-Ol	441	697	167	1132
ST-Hu	463	310	245	952	WS-SU	380	688	195	1042

WS-Wa	449	614	368	843	L1-O1	488	192	117	1750
WS-Zu	507	562	460	749	L1-SU	277	343	299	1455
WS-SA	465	586	368	833	L1-Wa	316	332	522	1184
WS-SI	537	538	427	785	L1-Zu	370	272	624	1097
WS-KP	483	643	353	934	L1-SA	325	308	534	1175
WS-HP	173	173	149	251	L1-SI	401	252	598	1118
Hu-Me	801	251	313	1085	L1-KP	270	395	583	1244
Hu-Li	676	379	241	1141	L1-HP	88	110	242	341
Hu-L1	431	611	234	1177	O1-SU	253	295	323	1506
Hu-O1	439	610	174	1103	O1-Wa	298	269	530	1259
Hu-SU	406	581	202	1096	O1-Zu	329	238	609	1171
Hu-Wa	377	601	249	828	O1-SA	312	247	550	1233
Hu-Zu	434	539	547	797	O1-SI	369	198	633	1160
Hu-SA	392	573	349	870	O1-KP	240	347	598	1305
Hu-SI	451	536	523	809	O1-HP	69	67	262	385
Hu-KP	437	611	408	995	SU-Wa	270	283	523	1139
Hu-HP	134	145	195	295	SU-Zu	317	246	623	1056
Me-Li	775	387	160	1173	SU-SA	289	261	451	1193
Me-L1	469	679	197	1135	SU-SI	323	274	627	1054
Me-O1	477	672	130	1204	SU-KP	254	325	557	1226
Me-SU	393	680	186	1084	SU-HP	99	111	232	341
Me-Wa	437	648	380	853	Wa-Zu	590	243	373	1124
Me-Zu	495	578	469	773	Wa-SA	542	290	316	1198
Me-SA	481	595	315	920	Wa-SI	576	264	259	1146
Me-SI	568	522	411	832	Wa-KP	360	466	424	1085
Me-KP	470	667	367	955	Wa-HP	148	103	168	316
Me-HP	156	157	163	270	Zu-SA	628	302	223	1164
Li-L1	430	509	249	1343	Zu-SI	661	282	346	1064
Li-O1	446	492	184	1408	Zu-KP	394	588	399	960
Li-SU	325	544	254	1260	Zu-HP	159	161	156	280
Li-Wa	362	547	479	980	Sa-SI	678	187	306	1162
Li-Zu	411	493	535	882	Sa-KP	370	472	402	1083
Li-SA	393	504	472	984	Sa-HP	142	161	152	285
Li-SI	461	450	546	918	SI-KP	421	560	364	1001
Li-KP	364	570	493	1071	SI-HP	166	144	152	294
Li-HP	112	126	217	316	KP-HP	255	60	76	392

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- AA American Anthropologist.  
 AAA-M American Anthropological Association, Memoirs.  
 AMNH-AP American Museum of Natural History, Anthropological Papers.  
 AMNH-HS Handbook Series.  
 BAE-R Bureau of American Ethnology, Reports.  
 MAIHF-INM Museum of the American Indian, Heye Foundation, Indian Notes and Monographs.  
 MNA-B Museum of Northern Arizona, Bulletins.  
 MNA-MN Museum Notes.  
 UC-PAAE University of California, Publications in American Archaeology and Ethnology.  
 UNM-B University of New Mexico, Bulletins.  
 UW-PA University of Washington, Publications in Anthropology.  
 YU-PA Yale University, Publications in Anthropology

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