# Western Apache Subsistence Economy 

Winfred Buskirk

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WESTERN APACHE SUBSISTENCE ECONONY

By
Winfred Buskirk

A Dissertation
In partial fulfillment of the Requirements for the Degree of Docton of Philosophy in Anthropology

The University of New Mexico

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1949
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This dissertation, directed and approved by the candidate's committee, has been accepted by the Graduate Committee of the University of New Mexico in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY


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## INTRODUCTION

## I. THE PROBLEM

The central problem of this thesis is an examination of the factors which influence and, in the past, have shaped the subsistence economy of the Western Apache. Anthropology has always been interested in questions of cultural relationships and contrasts and the processes by which the relationships and contrasts are established. This tribe is peculiarly strategic for such a study because of its mixed subsistence pattem, based upon agriculture as well as upon hunting and the gathering of wild food plants. Some groups of Western Apache rely primarily upon agriculture, while others depend more heavily upon hunting and gathering for their subsistence. This suggests a situation involving cultural lag and one in which the functional mechanisms of change are still active and observable.

Basic to the central problem is a knowledge of the detailed facts of Western Apache subsistence and of the material culture associated with subsistence activities. While there are several substantial bodies of published material on this tribe, the preponderance of the work has been in the province of social organization and religion. As among many peoples of the Southwest, lacunae exist in the areas essential to the thesis.

Therefore field work was undertaken in an attempt to fill these gaps. The descriptive section of the thesis presents in detail the fundamental aspects of Western Apache subsistence economy and associated material culture: namely, procurement, processing, storage, and preparation of foods; ritual, belief, social implications and attitudes toward these phases of culture. One obvious factor affecting the food-getting activities of the Western Apache is the subsistence economy of neighboring peoples. This comparative aspect of the problem, however, could not be effectively attacked by dissociating subsistence from other areas of the total culture. It will become abundantly clear in the descriptive portions of this thesis that among the Western Apache themselves agriculture, hunting, and food gathering were intimately associated with their social and religious life and their value standards. Consequently, a study of the relationships in subsistence economy between the Western Apache and neighboring groups had to be set within the larger frame of placing the Western Apache in terms of their total culture among the Apachean tribes, the Southern Athapascans, and the peoples of the Southwest.

It was hoped that once the total culture of the Western Apache had been assembled and examined some
appraisal could be made in regard to their cultural position and cultural antecedents in the American Southwest. This problem was complicated at the outset since this group occupies an intermediate position, culturally and geographically, between agricultural peoples on the north and west (Puoblo, Navajo and Pima) and huntinggathering peoples on the south and east (Chiricahua, etc.). Historical sources of the seventeenth and eighteenth centuries also indicate that the Western Apache were probably a highly mobile group, even in historic times, and that they came into contact with many other peoples of diverse cultures. Finally, since subsistence depends largely upon natural resources it is inevitable that problems dealing with the environment of the Western Apache form a part of this dissertation. Mhroughout attempts are made to evaluate the development of the subsistence economy in terms of possible enviromental determinants, percentage of utilization of total natural resources, and the role played by interference of non-ecological and historical factors.

## II. ETHNOGRAPHIC SUMMARY

The Southern Athapascans comprise a group of people who formerly ranged from southern Colorado south into Mexico, and from central Arizona east to the Great Plains. In historic times, seven divisions have been recognized on the basis of territorial limits, and cultural and linguistic differences. These are: the Navajo, Jicarilla, Kiowa-Apache, Lipan, Mescalero, Chiracahua and Western Apache. ${ }^{1}$

The Navajo occupied a territory in the fourcorners area of Arizona, New Mexico, Colorado, and Utah, extending south, formerly, as far as the Mogollon Rim. They were the most atypical of the Southern Athapascan tribes. Politically they were divided into numerous comparatively sedentary groups which functioned inde-

1 For a short comparative summary of Southern Athapascen cultures, see Goodwin, The Southern Athapascans. The best general descriptions of individual Apache groups are Kluckhohn and Leighton, The Navaho, for the Navajo; Opler, A Summary of Jicarilla Apache Culture, for the Jicarīla; McAllister, Kiowa-Apache Social Organization, for the Kiowa-Apache; Castetter and Opler, The Ethnobiology of the Chiricahua and Mescalero Apache, and Hoijer, Chiricahua and Mescalero Apache Texts, for the Mescalero; Opler, An Apache Life Way, for the Chiricahua. No general ethnological Summary of Lipan Apache culture has been published.
pendently of one another under the direction of a headman chosen on the basis of natural ability and ceremonial knowledge. Agriculture was the most important economic pursuit, with hunting secondary. In recent times sheep raising has assumed major importance. Warfare was less developed than among the Southern Athapascans. Societally the Navajo were organized into non-localized, matrilineal, exogamous clans. A weak phratric system existed, a characteristic shared only with the Western Apache. The extended matrilineal and matrilocal family was the basic social and economic unit. The greater part of Navajo religion was focused upon curing and preventive medicine, secondarily on agriculture and hunting. Lengthy rituals, called chantways, were conducted by a class of singers. Many Pueblo items, re-phrased and recast, are to be found in Navajo culture.

The Jicarilla occupied central and eastern New Mexico and the adjacent part of Colorado. They were divided into two culturally similar bands, the ollero, and the Llanero. These were further divided into local groups with recognized leaders. The extended matrilineal and matrilocal family was the basic social and economic unit. Though agriculture was practiced by a portion of the Jicarilla for some two hundred and fifty years, hunting was the principal economic pursuit. Recently stock
raising has replaced hunting, and agriculture has assumed greater importance. The influence of the Plains culture upon the Jicarilla was marked, as evidenced in their hunting, warfare, and use of such items as the travois, parfleche, tipi, and buckskin clothing. Their religion was strongly reminiscent of the Navajo with long curing ceremonies. However, there were also shaman-like religious practitioners. Jicarilla culture as a whole more closely resembled that of the Navajo and the Pueblo than did that of other Apache.

The Kiowa-Apache and Lipan were the most easterly of the Apache tribes. The former inhabited an area in the southern and western Plains, and were satellites of the Kiowa. The Lipan, in historic times, occupied the Texas panhandle and regions progressively southward in the Texas plains as far as the Mexican border. Iittle is known of Lipan culture; hovever, the information available indicates that their material culture, like that of the Kiowa-Apache, was plains in type. In nonmaterial culture both the Lipan and Kiowa-Apache were closely related to the Jicarilla.

The Chiricahua ranged from the Mogollon Rim through southwestern New Mexico, west through southeastern Arizona, and south into Chihuahua and Sonora. They were divided into three bands: the Warm Springs,
the Chiricahua, and the Southern Chiricahua. Bands were in turn broken up into local groups. Both bands and local groups had leaders chosen because of outstanding personal qualities. The basic economic and social unit was the matrilineal, matrilocal extended family. Hunting and the gathering of wild plants were the chief subsistence activities. Agriculture among the Warm Springs was nominal, at least within the last hundred years. Ritualism was highly developed in connection with the girls' puberty ceremony and the training of boys for war. Many individuals possessed personal supernatural powers which were exercised for the public welfare and in individual cures.

The Mescalero of southeastern New Mexico appear to have been very similar, culturally, to the Chiricahua, who are much better known. Hunting was the principal economic activity, supplemented by gathering and by a sporadic agriculture. In material culture they had acquired many Plains traits.

Common to most Athapascan groups, including the Western Apache, was the use of a brush or grass covered wickiup, the burden basket, pitched water basket, decorated conical-bottomed pottery with raised or incised decoration and flaring rim, extended domestic family with matrilocal residence the basic economic unit,
matrilineal descent, permissible polygyny, variations of the sororate and the levirate, mother-in-law avoidance, girl's puberty rite (except Kiowa-Apache), supernatural powers and religious rites acquired by individual through dreams or direct contact with source of power, curing rites, fear and horror of death. The Apachean tribes resemble one another closely in their social culture, but are less homogeneous in their material culture and economy than are the Pueblo. Their cultures show a varying amount of influence from both Plains and Pueblo, but differ radically from the Pueblo in their greater emphasis on hunting, warfare, and a less sedentary Iife.

Relationships between the various Athapascan groups have already been indicated in soveral areas of culture. On the basis of kinship Opler ${ }^{2}$ divides the Southern Athapascans into two groups: a Jicarilla-Navajo-Kiowa Apache group and a Chiricahua-MescaleroWestern Apache group. The Western Apache affiliate most closely with the Mescalero in kinship classification. ${ }^{3}$

2 Opler, Kinship Systems, p. 620.
3 Ibid., p. 629.

Hoijer ${ }^{4}$ places the Southern Athapascans in the following linguistic divisions and sub-divisions:
I. The Western Group
A. The Navajo
B. San Carlos (Western) Chiricahua-Mescalero 1. The San Carlos (Western) Group: San

Carlos proper, White Mountain, Cibecue,
Southern Tonto, and Northern Tonto
2. Chiricahua-Mescalero
a. Chiricahua
b. Mescalero
II. The Eastern Group
A. Jicarilla-Lipan

1. Jicarilla
2. Lipan
B. Kiowa-Apache

Western Apache territory included roughly the area bounded by a line running from Flagstaff, Arizona, to, and including, the Santa Catalina mountains northeast of Tucson, thence south of the Pinaleno mountains to the junction of the San Francisco river with the Gila, thence north along the Blue Range to Springerville,

[^0]and thence northwest to Flagstaff. ${ }^{5}$ Neighbors to the north and northeast were the Navajo and Hopi, Zuni, and Keresan Pueblo villages. On the east were the Warm Springs Chiricahua ${ }^{6}$ and in the Rio Grande valley, other Pueblo peoples. To the south were the Chiricahua, to the southwest the Papago, and on the west, progressing from south to north, the Pima, Yavapai, Walapai, and Havasupai. Beyond the immediate neighbors were other peoples, the Tarahumara and Opata to the south, and the Maricopa to the west.

The Western Apache ranged over a country highly varied in topography. On the north they inhabited the southern edge of the Colorado Plateau. This was an upland country averaging 5000 to 7000 feet in elevation, much of which was comparatively level. Mountains were high, but less rugged than those of the Basin and Range area to the south. The San Francisco Peaks in the northwest (over 12,000 feet) and the White Mountains in the northeast (over 11,000 feet) were the highest points in Apache territory. Climate was severe throughout the winter and early spring, with frequent heavy snowfalls, but was invigoratingly pleasant in summer.

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\begin{aligned}
& 5 \text { Goodwin, Western Apache, pp. } 4 \text { and } 12 \text { et seq. } \\
& 6 \text { Opler, An Apache Life Way, pp. } 1-3 \text {. }
\end{aligned}
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South of the Mogollon cuesta and west of the White Mountains the country broke sharply. Steep, rough slopes gradually gave way to mesa-like remnants of former plateaus, which were severely eroded and cut by deep canyons. From the Salt River southward there was a succession of abruptly rising mountain ranges which separated deep desert valleys. Though the country was much lower, varying from 2000 to 7000 feet, it was much more rugged than the Mogollon plateau country. The climate was mild in winter and hot in summer.

The Western Apache territories were arid except for the very highest elevations. Average annual precipitation varied from ten inches in the southern part to twenty-two inches in the north, but average figures are meaningless, as one year might bring rains of cloudburst proportions and the next year practically none. The peak rainy season usually occurred in July and August, with a second rainy season lasting from November through March. Precipitation was usually light in April and practically negligible in May and June. The frost-free season was from four to six months or longer, depending on the elevation.?

7 Geographical data is from unpublished materials placed at the author's disposal by Mr. Robert Holtz, Superintendant of the Fort Apache Indian Reservation.

Life zones in this region ranged from Canadian to Lower Sonoran. A close approach to Hudsonian occurred on Mount Graham in the Pinaleno Mountains and Mount Thomas (Baldy) in the White Mountains, but these areas were of negligible importance. The San Francisco Peaks, at the edge of Northern Tonto territory, extended into the Hudsonian.

The Canadian zone embraced those high plateaus and mountains from 8500 to 12,000 feet in elevation. In the Apache country most of this occurred in the White Mountains. Here were stands of Engelmann spruce (Picea engelmanni), blue spruce (Picea pungens), corkbark fir (Abies arizonica), and white fir (Abies concolor), frequently broken by mountain meadows and by stands of quaking aspen (Populus tremuloides) in burnedover areas. Below these occurred Douglas Fir (Pseudotsuga taxifolia).

The Transition zone, from approximately 7000 to 9500 feet elevation, contained Douglas fir; yellow pine (Pinus ponderosa), the dominant type in this zone north of the Gila River; and, in the lower part of the zone, Gambel's oak (Quercus gambelii) and alligator-bark juniper (Juniperus pachyphloea). South of the Gila River, the dominant pine in this zone was Arizona pine (Pinus arizonica). In the summer the pine forests were
carpeted with grasses, legumes, and composites.
The Upper Sonoran zone ranged roughly from 4500 to 8000 feet. Yellow pine was to be found through the upper levels of this zone mingled with the dominant vegetation, which consisted of pinon pine, junipers, and oaks. In the north the pine was pinon (Pinus edulis), in the south the nut pine (Pinus cembroides). The Utah juniper (Juniperus utahensis) and the alligator-bark juniper were dominant in the north; in the south the Utah juniper was replaced by the oneseed juniper (Juniperus monosperma). Oaks were Emory's oak (Quercus emoryi), the Arizona oak (Quercus arizonica), the blue oak (Quercus oblongifolia), and, in the lower elevations, the scrub oak (Quercus turbinella). Deciduous trees found along the streams and drainageways were the ash (Fraxinus velutina), sycamore (Platanus wrightii), cottonwood (Populus fremontii), and species of maple (Acer). Common shrubs and plants were manzanita (Arctostaphylos pungens), squawbush (Rhus trilobata), mountain mahogany (Cercocarpus spp.), mimosa (Mimosa biuncifera), barberry (Berberis fremontii), snakeweed (Gutierrezia tenuis), rabbit brush (Chrysothamnus spp.), Iycium pallidum, bear grass (Nolina microcarpa), sunflower (Helianthus spp.), yucca (Yucca spp.), agave (Agave spp.), and cacti (Opuntia spp.). In parts of this zone,
particularly along the Mogollon Rim, occurred open areas of scattered pinons and junipers and perennial grasses. Dominant grasses were species of Bouteloua, Sporobolus, Aristida, Muhlenbergia, Hilaria, and Stipa. With these occurred cacti, yucca, bear grass, and sage brush (Artemesia spp.).

In the Lower Sonoran zone, at elevations below 5000 feet were mesquite (Prosopis juliflora), creosote bush (Larrea tridentata), numerous cacti (Opuntia spp., Cereus giganteus, and others), saltbush (Atriplex spp.), and other xerophytic types. Along the streams were ash, cottonwood, and willow (Salix gooddingii). In addition to these were numerous ephemeral herbaceous plants. 8

Fauna of the Canadian zone included the Merriam elk (Cervus merriami), mule deer (Odocoileus hemionus), spruce squirrel (Sciurus fremontii var.), porcupine (Erethizon epixanthum), Arizona weasel (Mustela arizonensis), black bear (Ursus americanus), beaver (Castor canadensis), mountain sheep (Ovis canadensis), and numerous species of small rodents and birds. Mammals of the Transition zone were the elk,

8 Data on vegetation is adapted from Kearney and Peebles, Flowering Plants and Ferns of Arizona; Nichol, The Natural Vegetation of Arizona; Benson and Darrow, A Manual of Southwestem Desert Trees and Shrubs; and from information supplied by William Schroeder, forester of the Whiteriver Agency.
mule deer, Abert squirrel (Sciurus aberti), chipmunk (Eutamias Sp.), ground squirrel (Callospermophilus lateralis), wood rat (Neotoma sp.), beaver, porcupine, jackrabbit (Lepus Sp.), cottontail (Sylvilagus sp.), bob cat (Lynx rufus), cougar (Felis concolor), wolf (Canis occidentalis), coyote (Canis latrans), badger (Taxidea taxus), skunk (Mephitis sp.), raccoon (Procyon lotor), bear, and numerous small rodents. Birds included the Merriam turkey (Meleagris gallopavo merriami), bandtailed pigeon (Columba fasciata), and jay (Cyanocephalus sp.).

In the Upper Sonoran zone were whitetail deer (Odocoileus virginianus var.), the peccary (Tayassu sp.), mule deer, antelope (Antilocapra americana), mountain sheep (Ovis canadensis and Ovis mexicanus?), Arizona gray squirrel (Sciurus arizonicus), groundsquirrels (Citellus spp.), prairie dog (Cynomys sp.), wood rat, beaver, rabbit, cottontail, cougar, bob cat, gray fox (Urocyon cinereoargenteus scotti), coyote, wolf, skunk (Mephitis sp. and Spilogale sp.), badger, raccoon, and numerous small rodents. Among many birds were quail (Genus?), mouming dove (Zenaidura acroura), owls (Otus asio?), jays, raven (Corvus sp.), crow (Corvus sp.). Lower Sonoran mammals were peccary, jackrabbit, cottontail, jaguar (Felis onca), coyote, raccoon,
badger, skunk, and numerous small rodents. Birds included Gambel's quail (Lophortyx gambeli), the roadrunner (Geococcyx californianus), and the turkey vulture (Cathartes aura).

The Western Apache comprised five large groups (or super-bands), all closely related in language and culture, but each feeling itself distinct from the other groups. ${ }^{9}$ These were in turn broken up into bands (Goodwin classifies some as "semi-bands") which were each composed of several local groups. Groups (superbands) and bands were as follows:

1. White Mountain group
a. Eastern White Mountain band
b. Western White Mountain band
2. Cibecue group
a. Carrizo band
b. Cibecue band
c. Canyon Creek band
3. San Carlos group
a. Pinal band
b. Arivaipa band

9 Goodwin's basic papers, Social Divisions and Economic Iife of the Western Apache, The Social Organization of the We stern Apache, White Mountain Apache Religion, Myths and Yales of the White Mountain Apache are followed for all general Western Apache data.
c. San Carlos band
d. Apache Peaks band
4. Southern Tonto group
a. Mazatzal band
b. First semiband
c. Second semiband
d. Third semiband
e. Fourth semiband
f. Fifth semiband
g. Sixth semiband
5. Northern Tonto group ${ }^{10}$
a. Mormon Lake band
b. Fossil Creek band
c. Bald Mountain band
d. Oak Creek band

Bands and semibands were further divided into local groups of a semi-nomadic character. In the local group were several family groups, which in turn consisted of a variable number of households. In a local group, the majority were generally of the same clan, though some might be blood relatives of other clans, relatives by marriage, or unrelated. Usually the

10 The Fossil Creek, Bald Mountain, and Oak Creek bands of the Northern Tonto were intermingled with Yavapai who shared their territory.
members of an extended family group were related within the limit of second maternal cousin or were relatives by marriage.

Local groups were directed by one or more chiefs and extended families by headmen, chosen on the basis of personality and proven experience and performance, but usually from clans or lineages in which the office had been long held. The quthority of these men rested in their prestige and the force of good example.

Blood relationship, particularly on the maternal side, entailed strong obligations. Maternal relationship was reinforced by the clan system and the customary matrilocal residence. Obligations and responsibilities of a man toward his wife's family were also strong. Clans united the several Western Apache groups, bands, and local groups. These clans were matrilineal and exogamous. All members of one clan were considered blood relatives and were expected to aid one another in time of need. Clans were usually named after the legendary place of origin or first settlement and were sometimes also rather loosely called by the name of a "related" bird or animal. One clan might be related or linked to another or to several clans.

Though matrilocal residence was usual, it was not compulsory. Individuals and families were free to
change their residence from one local group to another. While polygyny was permissible, there was expectation that a man would seek additional spouses only among his first wife's maternal family or clan sisters, if eligible women among these were available. The affinal relatives retained a strong measure of control over a widower.

Hunting and gathering were the primary economic activities, and were of equal importance, though in some families and groups agriculture took on an importance equal to either hunting or gathering. Raiding and, to a lesser extent, trading were also important economic pursuits. More recently, the subsistence economy shifted to cattle raising, agriculture, and ofi-reservation employment.

The Western Apache lived in dome-shaped, thatched wickiups which were grouped together in extended-family settlements. Clothing was made from hides and consisted of hard-soled moccasins with leggings to mid-thigh, a breechclout for men, a long skirt for women, and optionally worn upper garments. Serviceable weapons and undecorated pottery were made. The only field of material culture in which they excelled was basketry. Coiled trays, ollas, twined burden baskets, and pitched water baskets were of unusually fine workmanship.

Women did the cooking, camp work, dressing of hides, gathering of foods, and building of the wickiups. Men hunted and performed all dangerous tasks or those requiring greater physical strength.

The principal deities were: the Sun; the culture hero, Slayer of Monsters; Changing Woman, mother of the culture hero; and a rather vague deity, In-Charge-ofLife. There was in addition to these a class of spirits (gan) who were believed to dwell in mountain caves. Masked dancers or clowns represented these spirits. Supernatural power was also believed to reside in many plants and animals.

The theme of the four directions permeated all ritual. Color direction symbolism linked east, the most powerful and holy of the directions, with black; south with blue-green; west with yellow; and north with white. East and west were considered male, north and south female. Sequences were always, except where witchcraft and death were involved, clockwise, and began with the east. Ritual numbers were four; eight (or twelve, or both eight and twelve) ; and thirty-two. Though color-direction symbolism is also characteristic of the Pueblo, their associated colors and directions and their sequences differ from those of the Western Apache.

Ceremonies of a traditional type, transferred, were performed in connection with girls' puberty rites, warfare, illness, and hunting. Nost curing ceremonies and many of those connected with agriculture and hunting were personal ceremonies gained through dreams or other contacts with the supernatural.

Folktales and myths contain many parallels with Pueblo and with other Southern Athapascan groups. They include tales in which coyote figures as a trickster and culture hero, tales of turkey as a culture hero, of heroes conceived through the agency of sun and of water, of an underground world, of a disastrous flood, and of the destruction of monsters by a culture hero.

## III. PROCEDURE

Field work for this study was done on the Fort Apache Reservation in Arizona, in June, 1946, JuneSeptember, 1947, and March-April, 1948; during these periods a total time of about five months was spent on the Reservation. Some material was also obtained during April-June and September, 1939, and June-August, 1941, but the author's primary investigations then were archaeological.

The principal informants consulted were John Lupe, Bland Tessay, and Claudie Goodey, of Cibecue; R 25, and Frank Tennajaeth, of Cedar Creek; Deklay, and Mary Velasquez (Mrs. Pete) Riley, of Fort Apache. Many other Apache confirmed data or provided information, but the most intensive vork was with the seven named. Interpreters wero Bland Tessay, Mary Velasquez Riley, a son of Frank Tennajaeth, Vincent Altaha, and Lester 0liver, the last two being members of the Apache Council who volunteered their services and would accept no compensation.

Information recorded was nearly all from the Cibecue and White Mountain Apache. Unless specifically ascribed in this dissertation to one or the other or a subdivision of either, it applies to both. Occasionally informants contributed data on other Western Apache
groups, but most of the material on these is from the literature. However, much of the material in this study may be safely assumed to apply to all Western Apache. Older informants who had mingled with the San Carlos and Tonto groups on the San Carlos Reservation stated the material culture of all the groups was essentially the same.

## CHAPTER I

## AGRICULTURE

Farming Sites. White Mountain: Eastern Band. The principal Eastern White Mountain farming sites were located on the East Fork of the White River from Fort Apache to the foothills of Mount Baldy; the head of Bonito Creek (a tributary of the Black River); the head of Turkey Creek; a site near the head of the Black River; Eagle Creek at the present site of the Double Circle Ranch; Point of Pine west of Eagle Creek; and a site at the head of Cienega Creek running into Eagle Creek. 1 Other sites were at Seven Mile Canyon, Corn Creek, and Canyon Day Village below Fort Apache. This last site was shared with the Western White Mountain band and was generally considered their territory. A possible site was five miles up a small unidentified tributary of the upper Gila, but this may have been a site planted by the Warm Springs Chiricahua. 2 Today they still farm on the East Fork, at Canyon Lay, Seven Mile Canyon, and Iurkey Creek, also on the North Fork

[^1]of the White River. Many are at Bylas on the San Carlos Indian Reservation.

White Mountain: Western Band. The Western Whit te Mountain farming sites were at Canyon Day, the moluth of Cedar Creek, upper Cedar Creek, and Bear Springs. 3 Some sites along the Salt River below Cedar Creek wrere also occupied. They still farm at canyon Day, on the upper Cedar Creek, and Bear Canyon.

## Cibecue: Carrizo Band. The Carrizo Band farmed

 alcong the Carrizo Creek above the present Highway 60 crosising; on the North Fork of the White River from Post Offilce Canyon to eight miles above Whiteriver; and on the head of Frorestdale Creek. 4 These people used to spend much time around Showlow and north of the Mogollon Rim as far west as the Cibecue meridian and farmed near Taylor, Shumway, Snowflake, and other areas. They ceased to use this area except for occasional hunting or gathering forays some 100 years ago, because of Navajo pressume. They are still on the Carrizo and on North Fork. One family cluster only remains at Forestdale.Cibecue: Cibecue Band. The Cibecue Band farmed

3 Goodwin, Western Apache, p. 15.
4 Ibid.,pp. 17-19.
on Cibecue Creek and its tributaries from Salt Creek down to four miles below the Day School. Patches were farmed along Salt Creek for nearly five miles and along Upper Cibecue Creek to White Springs. There was a smaller settlement at Spring Creek west of Cibecue. 5 According to informants people at one time lived on Spring Creek to its junctiom with the Cibecue and the Cibecue itself was populated down to this point. The last people died on upper and lower Spring Creek about 1918. People lived on middle Spring Creek until 1947. There were none there in 19417, but an informant stated in April, 1948 that he was going to plant some corn on a dry farm there.

## Cibecue: Canyon Creek Band. Canyon Creek Band

 sites were on Oak Creek; in Gentry conyon running into Canyon Creek; on Canyon Creelk; just below the mouth of Lost Fork Canyon; and on Cherry Creek at the east foot of the Sierra Ancha. 6 People used to live on upper Canyon Creek from three miles below the Oak Creek junction clear beyond Chediski tro the OW Ranch. They also occupied Oak Creek. Other sites occupied were Pleasant[^2]Valley down Cherry Creek to Roosevelt, Crouch Creek, and the top of Walnut Creek, but it is not certain that any of these were farming sites.

Cherry Creek, east of the Sierra Ancha, was reputed to be the best site in this band area. People left Cherry Creek in the seventies due to military operations and white encroachments; this area was detached from the Reservation. Some Apache had irrigated farms on Gledson Flats north of the $S_{a} l t$ River, but this site was evacuated about 1905. People had left canyon Creek by 1907. Goodwin, who had investigated the area about 1937, and Opler ${ }^{8}$ reported the Canyon Creek area (specifically some of the Oak Creek-Grasshopper settlements) still occupied. By 1947 just two families were left in this region, and these occupied some dry farms at Chediski, but did not remain throughout the year. Some of this band held land at Spring Creek (which Goodwin includes in the Cibecue Band territory). Close to ninety years or more ago there were some good dry farms near Blue House Mountain, about midway between the Cibecue and Canyon Creeks.

7 Ibid., p. 61.
8 Opler, Fort Apache Report, p. 9.


San Carlos: Pinal Band. Pinal Band farm sites were located for six miles along Pinal Creek. These were later called "Wheatfields". Some also were at the juncture of Pinal Creek and Upper Salt River, and on Salt River from the mouth of the Pinal to that of Tonto Creek. Farms in Coon Creek Canyon were shared with the Apache Peaks Band and the Canyon Creek Band (Cibecue). A site at Dick Springs Canyon and the Gila River was shared with the Arivaipa Band. 9

Farm sites were at the head and mouth of Arivaipa Canyon. Farms at the mouth of Dick Springs Canyon were shared with the Pinal Band. 10

San Carlos: San Carlos Band. The San Carlos Band had few farms, all on the San Carlos Piver from Victor's Bluff to Seven Mile Wash. 11

San Carlos: Apache Peaks Band. There were no farms in the Apache Peaks Band territory. Some of these people had small units on the San Carlos River at the mouth of Seven Mile Wash and about a mile below. Others had farms with the Pinal Band at Wheatfields. A few

[^3]had farms at Coon Creek Canyon shared with the Pinal Band. 12

San Carlos Grroup. Present day San Carlos communities are located at Bylas, Calva, Peridot, and Rice or New San Carlos. Thie San Carlos practiced agriculture less than the Cibecue, probably less than the White Mountain, but more than either of the Ponto Groups. 13

Southern Tonto. The Mazatzal Band had farms on Tonto Creek from the mouth to above Gem Creek.

Sites of the Siecond Semi-Band were along Spring Creek, at Gisela, and at the juncture of Rye and Tonto Creeks.

Third Semi-Band farms were at Payson, Round Valley, Green Valley, and Star Valley.

Farms of the Fourth Semi-Band were at "Bluefarms" at the north end of the Mazatzal Mountains.

The Fifth Semi-Band had farming sites in the vicinity of White Roclk Mesa north of the East Verde River; at Weber Canyom north of the East Verde; on the East Verde just below the Payson to Pine road; at Pine; on Pine Creek near Natural Bridge; at Strawberry;

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12 Ibid., p. 33.
I3 Ibid., pp. 60-61.
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and on the south forlk of Strawberry Creek. 14

Northern Tonto. The Northern Tonto farmed the least of any of the Western Apache groups. The Mormon Lake Band did not hawe farms, claiming they lacked water or suitable ground and were too exposed to the Navajo, Havasupai, and Walapai. The Bald Mountain Band and the Oak Creek Band also lacked farms.

The Fossil Creek Band had a few tiny units on Fossil Creek, on Clear Creek, and on the Verde River below the mouth of Deer Creek, but most of this band had no farms. 15

Some of the $\mathbb{T}$ onto are now at Gisela, Camp Verde, and Payson. 16

Topography; Soils; Site Selection. The rugged terrain of the Westerm Apache country and the scarcity of water placed great limitations upon the area suitable for cultivation. Lack of tools except the digging stick and the stone axe further limited the choice of locations. In selecting a field the prime requisite was water. Sites had to be close enough to stream level so that a

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\begin{aligned}
& 14 \text { Ibid., pp. } 36-41 . \\
& 15 \text { Ibid., pp. } 43-45 . \\
& 16 \text { Ibid., p. } 43 .
\end{aligned}
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dam could be built and a ditch led in without too much labor. The site also had to be reasonably free of large vegetation and fairly level.

Agricultural possibilities varied in the different group territories. White Mountain informants stated that plenty of undeveloped lands were available which could be cleared and planted, that everybody who wanted one could have a farm. There are records of new farm land being cleared in East Fork, 17 and some time between 1845 and 1855 the Eastern White Mountain allowed some of the Carrizo band to settle in their North Fork territory and develop farms. 18

The Cibecue band had more developed arable land than any other. Others called them the "Corn-Feeds -the-People-Folk" and friends and relatives came up from the San Carlos group at harvest time to get corn.

To the west the Canyon Creek band had distinctly limited farming opportunities. It was difficult to find places where water could be easily introduced onto a field. In the upper Canyon Creek-oak Creek district there were only thirteen land owners or land-owming families in the eighties, prior to the advent of white

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\begin{aligned}
& 17 \text { Ibid., p. } 673 . \\
& 18 \text { Ibid., p. } 19 .
\end{aligned}
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farm agents, holding some twenty-seven to thirty farms. About fifty families borrowed these farms or helped on them for a share of the produce. There were far too many helpers for the amount of land. The fact that one woman in this area used four farms from eleven to fifteen miles apart indicates the difficulty of finding suitable sites.

Most farms were along the stream courses. Here, in pre-American times, large trees, such as the cottonwoods which are now so prevalent, were said to be largely absent. Willow grew along the banks. Bottomlands were covered with high "feather" grass (probably gramma). Farm sites were located where there was little vegetation and where a shallow ditch could be dug from the water level of the stream to the field. Farms tended to be long and narrov. In the canyon Oreek area they were up to 220 yarms long and only ten to fifteen yards wide.

There were some farms not along the stream beds. Some were watered by smiall springs. Some were placed along wet seeps such as were found along the hill sides at Cedar Creek and in the Bear Springs area. Others were planted where the run-off of the rains could be diverted onto them from the hillsides, as up Salt Creek above Cibecue and at Beiar Canyon, or from dammed arroyos,
as at Bear Canyon. In the latter case planting was not directly in the mouth of the arroyos but to one side where the danger of flood damage was not so great. A few, such as in the upland pine country around Forestdale, were dry farms.

Flood lands were never selected as field sites. Probably such a selection would not have been feasible, as the heavy rainy season came during July and August, too late to flood a field prior to planting but at a time when crops might be washed out.

Soil does not appear to have had too much importance in the selection of field sites, but it was considered, at least by those who had an abundance of sites topographically suitable. Black dirt, not too sandy, was greatly preferred to red clay and excessiveIy sandy soils. A Canyon Creek informant's grandmother had liked to plant in the "black dirt with straw" which had flooded in from the mountains, but would plant in all kinds of soil. The Cibecue denied ever making a selection of a site by the luxuriance of the vegetation, but the White Mountain, perhaps because in the fortunate position of having more irrigable sites to choose from than they could use, often picked a spot for this reason. Heavy red soil was greatly disliked. Alkaline soils were planted, and continued to produce if they
were well drained.
In former days the Apache avoided living too near their farms, because of danger from enemies. They preferred hill tops to valleys as camping spots, and the women carried water and corn to the top. According to old informants, in the Cibecue Creek area the people moved down from the mountains to the small hills along Cibecue valley between 1880 and 1885. About 1895 they began moving into the flats, where most now live. Areas covered with a heavy growth of brush were selected for camp sites because they afforded concealment from enemies.

During the military campaigns of the Americans the Apaches tried to plant in hidden locations where their corn would not be discovered and destrojed. Even after the forced exodus from north of the Salt River to San Carlos, many old people hid and planted in inaccessible places.

Fertility. The soils of the Fort Apache Reservation have not been analyzed, though one such project is underway on the school farm at Fort Apache and the soil and moisture staff at the Phoenix Regional office and the Whiteriver Agency hope to undertake others. Nevertheless, they are known to be sufficiently fertile.

Moisture is the limiting factor to good crop production.

The very extensive archaeological ruins on the Fort Apache Reservation and on other areas occupied by the Western Apache indicate that the territory once supported a very considerable prehistoric sedentary agricultural population. Hough, 19 writing of the Forestdale district, states:

It is not surprising, therefore, that in this favorable environment pueblos of large size developed; the cause for wonder is that in this region the pueblo dwellers have not persisted to this day.

Bourke 20 devotes half a page to the bountiful crops of corn, pumpkins, wheat, beans, vegetables, and fruits raised on Cooley's Ranch up the North Fork of the White River. An unofficial report of the whiteriver agency in 1944 states that yields of corn up to thirty bushels to the acre were harvested on dry lands in a good year, though they may be totally lacking in a dry one.

The author saw fine stands of corn and beans on both irrigated and unirrigated Indian fields and good alfalfa fields under irrigation. Missionaries at White-

[^4]river have raised an abundance of garden vegetables for over thirty years. At Kinishba Pueblo, some four miles west of Fort Apache, in an area with a juniper-yuccacactus cover, a vegetable garden was planted for some ten years, without fertilizer, and regularly yielded an excellent return of tomatoes, onions, carrots, cabbage, potatoes, and the usual garden produce.

The Apache claim that they have always fallowed ("rested" is their term) their fields. A family owning four to six small farms might plant two or three a year, possibly four. They believed it necessary to "rest" a field for a year every two or three years. One man stated that the people formerly used to rotate crops, insisting that fields must be fallowed; now the modern people do not rotate crops, but "plant comn, corn, corn, all the time." Another stated that a field was always left idle for a year after a planting because the yield was not good if corn was grown on the same land year after year.

Though some of the modern Apache may abuse their fields, many certainly follow the ancient custom of "resting" them. Opler 21 stated that most of the land lay fallow much of the time, perhaps a third of a field

21 Opler, Fort Apache Report, p. 34.
being planted in any one year, then another third the next year.

It is the author's observation (seasons of 1939, 141, 147, 148) that over half of the enclosed lands lie unused in any one year. Many fields in outlying areas, such as the old Canyon Creek-Oak Creek area, Spring Creek, and others are used only sporadically if at all. An unofficial report of the Whiteriver Agency stated in 1944 that there were 4000 acres under irrigation and 3000 acres of dry farms being farmed. It is doubtful that these were actively farmed. Probably the figures represent acreage cleared and available for farming or a total of all acreage previously used. The official annual report of the Ageney for the calendar year 1947 showed a total planted acreage of 1018 acres ( 107 acres in forage crops, 865 acres of corn, 29 acres of beans, 17 acres of garden crops). This is if anything small, as it would be easy to overlook some planted acreages in a report covering such a large and scattered area. In fact, the author noted some small wheat acreage unreported. The amount of cultivable land reported may be large, as probably not all the reported irrigable lands were currently served by usable irrigation systems. But these figures do indicate that perhaps six out of seven improved acres were unfarmed in 1947
and that of the irrigable land perhaps two out of three acres were unused.

Animal manures were never used in former times. Indeed, the idea of using them would have been repugnant, probably, as it is believed that contact with some animal excrements may cause sickness and it was not customary for one to commit a nuisance in a field. Some manures are now used, though not to the extent that the government farmers would like. Probably most of the Apache would now have no ideological objection to the use of horse manures. Their failure to use more is due to the difficulties of collecting and spreading them and to a lack of understanding of their value to a field.

One White Mountain man stated that they used to burn the gramma grass on a field because the ashes were good for corn, but that weeds and comn stalks were taken to the edge of the field to burn and their ashes not scattered. Others confirmed that weeds were thrown clear of a field and, though they might later be burned, the ashes were not put on the field. Although corn stalks might be raked into piles in a field and burned, their ashes were not spread. At the present time weeds are pulled or hoed and left in the field. Beans were almost invariably pulled, vine and all, and removed from
the field for harvesting. The agency farmers have attempted to encourage the practice of growing and plowing under of cover crops to improve a field, but with little success.

The Cibecue groups did not plant many seeds and thinned the corn if the plants appeared too numerous. The White Mountain followed the same practice unless they were unsure of the quality, in which case they planted many kernels to a hill so those that sprouted could "feed upon the extra grains."

Pumpkins and beans were often crowded between the rowis of corn, however; many also planted these crops separately. This type of planting is still followed by many. The author saw an unirrigated field at Cedar Creek, where corn, pumpkins, and beans were much too closely planted for any but an irrigated field. The Agency Farmer stated that many had the impression that the closer the plants were placed, the better.

At San Carlos fields were sometimes doublecropped. One informant who had lived there as a boy stated that this was done in pre-American days. The Mexicans taught the Apache to raise winter wheat and then to plant corn after the wheat harvest. He had seen this done in the 1880's, but was told the practice was much older. He further stated that this practice
is still followed, but that it was never done by the White Mountain and the Cibecue groups. The harvesting of a crop of barley at San Carlos in 1875, followed by immediate replanting to corn, is mentioned by clum. 22

Climate and Calendar. With the arrival of "Standing Moon" and the gentle "time to plant wind" in March it was time to think of planting. Sometimes planting time could be determined by moons or by solar observation, but in actual practice other phenomena were relied upon. At Canyon Creek some watched the progress of the sun against certain landmarks as indicating planting times and, according to Canyon Creek and White Mountain informants, some of the San Carlos and White Mountain also did this. There was no official sunwatcher.

Planting times were actually determined by plant and animal behavior rather than by celestial observations. When the grass turned green end the mesquite yellowed with flowers and the spring birds came along below the Salt River, the upper Canyon Creek people knew it was time to return to their planting grounds. When the large cottonwood trees budded and began

[^5]turning green it was time to begin planting. Another indicator was the flowering of wild plants.

At Cibecue there was one large cottonwood tree which was watched by all the people for their planting cue. When this tree was killed by lightning the calendar was substituted.

The people of Cedar Creek began planting when the cottonwoods began to leaf and when the mescal plants flowered. On the East Fork the cottonwoods, chokecherries, and other wild plants were watched for signs of budding and leafing. When the cottonwood was in full leaf it was time for the second planting of early white or sixty-five day corn. Here the sun was not watched.

All were agreed that the return to the farm sites was made in March or April. One informant stated that planting of corn (and later wheat and potatoes) in the upper Canyon Creek area began as early as March, though it might be as late as April or May. April and early May were the usual planting times given, this varying somewhat with elevation and climate.

At Chediski, where killing frosts sometimes occurred in September, corn was planted earlier than at Oak Creek and would be ready to harvest about the end of August or early September. On Turkey Creek and at other areas of high elevation, such as Forestiale,
planting was begun in April, whereás on lower North and East Forks planting was in May and June and could even be delayed until July. Planting was early in White Springs, above Cibecue, since the area was shaded and the crops protected from the summer heat.

Harvest was determined by maturity of the crops, frost, or convenience, and among the White Mountain also by solar observation and the morning rising of the Pleiades.

An attempt was made to harvest the crops before the first frost. One informant stated that in former times in the oak Creek district corn was harvested and stored by August 19th. Pumpkins were not gathered until October, however. White Mountain harvests varied from September to November, depending upon planting time and type of corn.

At the present time the Apache plant by the calendar. Corn is planted late April or May (whites at Whiteriver think the Indian planting somewhat late). At Cibecue some dry farms were planted April lst, some April l5th in 1948. Wheat is planted in March. Potatoes are planted during March. Beans, which used to be planted the same time as com or a few weeks later, are now planted in July. Some were plented on August 1st in 1947.

In the more heavily populated areas such as the Cibecue and the North Fork-East Fork districts the frost-free seasom extended on the average from mid-May to mid-October. Higher, in the jellow pine belts of Chediski and Forestale, frosts occurred as late as June and as early ass September.

Normally mainfall was heaviest in August, with September almost as heavy and July a close third. Though these are the months of greatest precipitation according to availlable weather data, Apache informants always named July as the rainiest month. June rain was usually negligilble. An old medicine man stated this was the only month when his rain-bringing powers were ineffective. Wintier rains were often heavy, and march had an average precilpitation of nearly two inches. The Apache believed that rains could be expected after the coming of a new mocom and that there might be frequent storms until the moon became full. The crescent of the moon was thought to hold waters which were released as it approached its full state.

Ownership and Inheritance. The five Western Apache groups had recognized territorial limits. Farming sites belonged wholly to the group within whose territory they lay amd were almost never shared by
mpeople of different groups. Groups were divided into boands, each with its own territory. Farming sites were conly shared by people belonging to different bands of the same group if they were located on, or very near, the border between two bands. 23 Such a situation existed between the Eastern and Western White Mountain at Cianyon Day, the Cibecue and Canyon Creek Bands at Spring Cireek, and the San Carlos bands.

The exclusive holding of territory by a group has broken down under the reservation system. Now White Nicountain, Cibecue, and San Carlos have moved into each other's old territories. This is the result of intermarriage, employment opportunities, desire to be near agency facilities, or because of former relocation by military authorities. White Nountain, San Carlos, and Tonto are all to be found on the San Carlos Reservation. White Mountain and San Carlos people hold part of the Cilbecue, San Carlos, and even a few Chiricahue are to be found in the old White Mountain territory.

Farming sites were associated with clans. Usually they were thought of as belonging to a dominant clan, though the lands were actually owned and operated

23 Goodwin, Western Apache, pp. 9-10.
by members of several clans, some of which might be related or linked. Ordinarily none but members of the owning or related clans or blood relatives could develop or hold land at a site, though temporary use might be permitted. 24

Farms were often held by individual men or women. One man who conducted the author on an inspection of his farm was very proud that it was "all mine" and that the irrigation improvements were his own work. Farms owned by more than one individual would usually be spoken of as the property of one person. 25 A farm operated by a family was generally spoken of as belonging to the husband regardless of actual ownership, because he was the head of the family. 26

Farms might be owned jointly by siblings, by a family, or by a family cluster of two or more households. Frequently they were held in trust by a widow, widower, uncle, or other relative for minor children.

Usually farms owned by an extended family were at the same farming site. Outsiders marrying into a family would ordinarily give up farms at another site,

[^6]but might keep them and return to them for the farming season. 27 There might be ownership at scattered sites, however. Such a condition is found frequently today, one man having farms at both Cedar Creek and Canyon Day, or at North and East Forks, or at Cibecue and Carrizo, Spring Creek, or upper Canyon Creek.

The number of farms owned by an individual or a family varied, but owners were more likely to have several than one single farm. There might be as many as four, five, or six small plots to a family among the White Mountain. On the upper Canyon Creek, where lands were scarce, of thirteen owners or owning families, one had four farms, one had one, two had two, while nine had three farms.

It was extremely difficult to arrive at any estimate of the actual number or percentage of Apache owning farms. In the $1880^{\prime} \mathrm{s}$, according to old informants, some thirteen families held land in the canyon Creek-Oak Creek district, while over fifty had no land of their own.

Informants stated that "everybody" or "almost everybody" had land in the old days on the cibecue, at

27 Ibid., p. 128.

Carrizo, at North Fork, and at Cedar Creek. Gifford28 records his cibecue informant, who was from Carrizo but long a resident at Cibecue, as stating that the majority of the cibecue group did not have land. This is undoubtedly true of the Canyon Creek Band and may have been true of the Carrizo Band, but it is doubtful that it would apply to the Cibecue Band. Informants indicated that here practically everybody formerly farmed, though it is quite likely that many were not outright land owners.

Goodwin 29 states that probably not over sixty per cent of all the White Mountain Apache owned or shared farms and that at any given site associated with a local group probably not over forty-five per cent would own or share farms there, an additional fifteen per cent having farms elsewhere.

Trees and wild plants on a farm belonged to the owner. Goodwin ${ }^{30}$ states that stones and clay and firewood on a farm belonged to the owner, and one of his informants even stated that an owner could refuse to let others get water from a spring on his land, though

28 Gifford, Apache-Pueblo, p. 100.
29 Goodwin, Western Apache, pp. 151-52.
30
Ibid., pp. 376-77.
in practice water would never be refused. Today planted trees are privately owned, but trees planted on another's land belong to the land owner.

Clearing a plot gave no title to contiguous land. A neighbor could clear a patch next to it without permission. This did not result in quarrels since only small areas were planted and excess land was available. Normally if a man desired to plant a different kind of corn than that of his neighbor he would go down stream a quarter of a mile to prevent cross pollination.

Land was never sold in former times, transfer, other than for temporary use, being by gift or through inheritance. Today ownership is vested in the tribe by the constitution adopted under the Reorganization Act and the Apache Council transfers land from one user to another. Improvements on a place are individually owned and may be sold, in which case the council is asked to approve the land use by the buyer. In practice the de facto ownership and transfer of land goes on very much as it always has under Apache custom. If a man does not use a farm for two years the government Farmer may threaten to ask the Apache Council to take it away from him and redistribute it.

Farms might be given to blood relatives or affinal relatives joining a group. An individual
changing his place of residence or local group affiliation was likely to give his farms away if he received new ones or the use of new ones at his new home. Goodwin ${ }^{31}$ mentions a number of such specific cases, all involving a transfer to blood kin or to fellow clansmen. When drought ruined many of the farms in the Bear Springs area in around 1864, many of the relatives, inlaws, and clansmen of these people sent for them and gave them new uncleared sites or divided their own farms with them. 32

Both sons and daughters inherited farms from either the maternal or paternal side of the family. In the case of grown children place of residence largely determined which of them inherited. Married daughters living at home were likely to receive the property, married sons living away from home relinquishing any claim in their favor. Married daughter living elsewhere also might give up their claims in favor of children still at home. 33

Goodwin's 34 survey of family clusters and the

31 Goodwin, Myths and Tales, p. 76; Wester Apache, pp. 154-55.

32 Goodwin, Western Apache, p. 655.
33 Ibid., p. 151.
34 Ibid., pp. 130-131, $138-44,630-50$.
lands used providess many illustrations. The author collected a number of specific examples and explanations of land ownership, use, and transfer, most of them involving inheritance by direct descendants.

An Dak Creek woman and her husband cleared four farms, which they jointly owned, "but the woman's family had the most interest in it." Following the husband's death this woman and her daughter and son-in-law continued to operate the farms. After the son-in-law's death in 1890 the Oak Creek farms were abandoned to relatives and the group consisting of grandmother, daughter, and very young grandchildron moved to their farm on Spring Creek, where they had relatives (already this and the other farms are spoken of no longer as the older woman's but as her daughter's). This Spring Creek farm was later used by a grandson until his death and is now unused. Another farm, at Chediski, is operated in season by a man of some clan or affinal relationship which was not exactly determined. After three years at spring Creek the little family removed to Cibecue. Here they were loaned a farm on Lower Cibecue by the chief $Z 1$, whose children were their relatives. After farming this land for two years the chief 01 came down from Upper Cibecue and said to them, "I want all you people to come up to my
place and stay with us. I have the biggest piece of land there and nobody to plant it." (They were clan relatives of the 0 group). There they stayed, and one of the grandsons has inherited the home site and farms which they were given by 01 .

The former Cibecue people were said to have practically died out, the present owners in many cases being people who came from elsewhere after 1900, including some from San Carlos and the Carrizo, Canyon Creek, and the White Mountain bands. At first, as incoming men married at Cibecue, the wives were "the boss on the land." Later, if the man worked it well for a few years, he became "the boss on the land." The wife might divorce her husband at any time and keep her land, however. If the woman should die, the widower remained "the boss." Where widowers inherited it was for their children or, in the absence of children, because the wife had no close blood relatives or because these did not wish to dispossesshim.

A unit on East Fork has been omed and occupied in tum by great-great-grandmother, great-grandmother, grandmother, mother, and the present occupant, who hopes that her children will stay there when she is gone. Perhaps the most usual type of inheritance is from mother to daughter, due to the prevalence of matrilocal

When a man cleared a piece of land his wife and his children became his heirs. Farms were divided among all children, or among all who wished or needed them. The oldest child might inherit a wife's farm. If there were no children or if these did not want it, a farm would go to brothers, sisters, nieces, nephews, cousins, or other relatives or clan relatives. In one instance at Cibecue a boy (the son of a man unusually wealthy by reason of property and steady employment) lived for years with an old man not related to him and inherited from him, in the absence of other close claimants, his house, lands, and a good many cattle.

Selection of the person to inherit property was influenced by the expressed wishes of the deceased, by closeness of blood relationship and social bonds in life, by need, and by proximity of residence. The decision seems usually to have been settled by the family (elose relatives and clan relatives) without quarrel, though there were occasional disputes requiring a chief's arbitration. A site might continue to be used and owned by a family or family cluster, title becoming vested in the group.

Occasionally sites were abandoned and later occupied by other clans. This occurred when feuding
tca.tcl.dn clan was forced to leave Carrizo. It also happened during the campaigns of the 1870's and 1880's and during periods of drought. Though such lands may still be referred to as the land of the formerly occupying clans, title rests indisputably with the present owners, for the land had been abandoned when they took it. 35 Land abandoned or not used by its owner may be taken by another, but the owner may reclaim it at any time.

Blood, clan, and affinal relatives, or friends were often granted the use of unneeded farm lands. Farms so loaned could be reclaimed at any time, but the arrangement was likely to continue indefinitely. At the present time farms originally occupied on loan have become, through the death of the original owners and by reason of long occupation and use, the inherited property of descendants of the borrowers.

A temporarily abandoned field was occasionally preempted and planted by another without permission. If the owner asked for it the preemptor would have to return it. The owner could destroy the crop and plant his own, or the two might agree to share the already planted crop or to divide the field -- "either way he

[^7]want it." Occasionally such a situation would result in a dispute wich was settled by the chief.

When temporary use of a farm was granted to an outsider unrelated by blood, affinity, or clan, approval of the clan chief or local group chief was asked as a matter of courtesy and was almost invariably given. 36 Fields were occasionally lent to be worked on shares, but this was the only form of rental.

There has always been occasional quarreling over the ownership, use, and inheritance of farms. Informants indicated that quarrels were most frequent, at the present time at least, in the Cibecue area of the Fort Apache Reservation. This may be because of the influx of new population into Cibecue, or it may possibly be, as the White Mountain claim, that the cibecue are more inclined to "crankiness" and quarrelsomeness than other Apache. Disputes at Cedar Creek have been infrequent, at least in modern times.

According to a Canyon Creek man, in the old days some "cranky" people would plant or harvest more than their share of a field and serious disputes and fights ensued. Sometimes an aggressive person would trespass on part of another's field already planted.
Ibid., pp. 150-151.

According to Goodwin 37 disputes over ownership almost always occurred at new sites where ovmership had not been long established. The man who first marked off a plot of ground and began to clear it had prior rights, but occasionally someone might try to preempt part or all of it. These quarrels were usually settled on the spot, but a fight might ensue in which case a chief might intercede.

One dispute came to the author's attention in which two foster brothers fenced property. When one died, his wife inherited his share. After her death, her brother would not allow the surviving partner to occupy the property. The dispute came before the Apache Council and was undecided in 1948, but it was the general opinion that the land should revert to the tribe and be redistributed.

Information on crop ownership was somewhat contradictory. Either a man or a woman might own a crop, and the same person who owned the crop in the field owned it after the harvest. Yet where a family operated a farm, the woman appeared to have greater claim to ownership, irrespective of who owned the land.

37 Ibid., p. 424.

A crop would be divided with all one's marital and blood relatives if they needed it. Either the man or the woman could give away part of the crop. If a man owned the crop his wife could give part away sometimes without consent. But if a woman owned the crops the husband could not give it away.

Formerly standing crops were invariably burned or abandoned if the owner died, though, in a family field, some, perhaps half, might be spared as the share owned by the bereaved spouse and children. This destruction was accomplished by the kinsmen of the deceased, not by the widow or widower. It is still a common practice.

Boundaries. Groups and bands of the Western Apache had recognized territorial limits, though others might travel through them to raid or, at times, to hunt or gather wild foods. Large and prominent geographical features such as mountains, hills dividing valleys where water ran, or rivers marked the boundaries. Clan farming localities and individual farm sites were generally known and recognized. 38

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38 \text { Ibid., p. } 9
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In former times there were no fences and apparently none were needed, as there were not enough horses in the area to menace the fields.

Both White Mountain and Cibecue peoples claimed that there was no difficulty in distinguishing boundaries between fields and that there was usually a ditch boundary. Gifford 39 states that stone boundary markers were used by the Cibecue and White Mountain, but no confirmation of this was obtained.

Relatives or family clusters often farmed five or six plots in a common field. The Cibecue designated individual areas within a common field by cutting the tips of adjoining rows. This was denied by the White Mountain.

When the number of horses increased to the point where they became a menace to crops, brush fences were erected. Green oak brush was piled in irregular fashion to enclose a field, or, more commonly, several fields. If a fence enclosed more than one field, the owners helped each other in erecting it. These oak brush fences lasted two or three jears. As soon as they rotted another layer of fresh boughs was piled on top. Juniper brush was used for fences at Cedar Creek

39 Gifford, Apache-Pueblo, p. 168.
and very probably was elsewhere when readily available. Cactus or thorny brush was never used, though in more modern tines cactus was sometimes used to protect watermelon patches from small boys.

Wire fences were first used in the Fort Apache area in 1889, at the same time they began to have "big" farms according to informants. At Cibecue the first Government Farmer issued barbed wire in 1895, requiring in return one day's work per spool. Today fields are universally enclosed by wire. Wire and post fences are not infrequently struck by lightning. When this occurs a medicine man is called to make repairs and the damaged post is hidden, so that no one will incur illness by stepping on it.

Boundaries of Individual fields were often determined by terrain and vegetation. If size were not limited by these natural factors a man would estimate by eye the amount of ground to be cleared or planted. Sometimes boundaries were fixed by arrow-shoot, but this was done only by those with big farms. In the arrow-shoot method only the length of the field was determined, not the width. To fix the length the archer would stand at a predetermined western boundary of his field, then shoot the maximum distance to the east. Going to the point Where his arrow dropped, he would shoot again to the east.

He might shoot twco or three times, but never four. The reason for this metihod was not explained by informants, though one had userd it.

Size of Farms. It is difficult to estimate with any great accuracy the actual amount of ground cultivated by the Apachie. Early observers used the adjective "small" and synonymous terms in commenting on Apache fields, but left no more precise description. Goodwin uses such terms as "small" and "tiny" throughout his Social Organization of the Western Apache. Elsewhere 40 he speaks of aboriginal White Mountain fields as being small, one-half acre or so.

The White Mountain Apache often had as many as four to six little farms to the family, of which they might plant two or three, though sometimes as many as four. They did not attempt to plant large fields, only enough for a family. On Cedar Creek Crossing fields were about two acres, but such were divided into several plots, perhaps five on the average. This would allow two-fifths of an acre per individual plot. On Upper Cedar Creek the measurements given by informants on the usual family field amounted to not quite three-fourths

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of an acre.
One informant estimated that in the Canyon CreekOak Creek area the farms were only one-half or threefourths of an acre. When he gave dimensions (some of the larger farms were said to be one-eighth of a mile long by ten or fifteen yards wide following the narrow valley bottoms), resulting plots varied from less than one-half to slightly under three-fourths of an acre. Others were smaller; by pacing off plots estimated to be of comparable sizes to those which the informant remembered, the author arrived at a figure of one-tenth to about one-twentieth of an acre. Arable land was scarce in this area. As nearly as could be learned there were only thirteen owners there in the l880's, of whom one owned just one farm, at least two had two farms, one had four, and most had three. The chief Darn (N I), with two farms, had the largest total area. Over fifty families in the area helped the owners for a share in the produce, but there were "too many people to help." An attempt to estimate the amount of land cultvated by the yield proved even more difficult. One White Mountain man stated that corn was raised in enough quantity to store for four years ahead. However, this appeared to be unusual and the usual goal set was enough produce for one year. Great care was taken in caching,
as "corn was scarce in those days." Each family tried to maintain several caches, distributed at widely separated points, for emergencies. A Cherry Creek man stated that they raised enough corn for one winter, but not two, as they had "poor people and children to feed."

At Oak Creek an informant's grandmother, who had four fields, harvested less than two sacks of corn. But helpers in this area were said to receive fifty to seventy-five pounds of corn, or two or three bundles of large ears plus the nubs they set aside. This woman raised only five or six large pumpkins, sometimes none, though other families there raised from five to ten. After the military occupation she planted about ten hills of potatoes.

According to a cibecue informant an abundant crop before 1900 consisted of four or five one-hundred pound sacks of wheat. Some indication of crop size can be gained from a Cibecue account of 1891 or 1892. Seven horses made four trips each to carry it. The corn was packed twelve bundles to a horse. As there were ten or twelve ears to a bundle, this would amount to from 3360 to 4032 ears, probably in the neighborhood of 3700 ears in all. In addition to this amount, the four boys who brought horses were given half a sack each. It is likely that a prior distribution had been made to
those who had helped in harvesting or planting. Allowing a spacing of one corn stalk to the square yard (spacing was sometimes thinner, often thicker) and allowing one ear to the stalk (two ears was normal), 3700 ears of corn would have been grown on about threefourths of an acre, 4000 ears would have required fourfifths acre.

In estimating the size of farms it must also be remembered that fields were planted (often with neighborly help) in one day. No case of more than a day being taken in the planting a field was reported. Fields in pre-American times were definitely smaller than those today. This was emphasized time and again by the older Apache. "Garden of grandmother a nice size -- Indian garden got too big." "Apache never used to grow a big patch of corn, just a little patch. They said, 'Somebody find it, pull it all up.'". In early days they raised "not too many pumpkins, just five on six is all." "Didn't raise many pumpkins because field not big enough in those days." "Didn't plant big fields of wheat, just enough for family." Let us look at the size of the present farms which are larger than those of pre-Caucasian days.

Opler 41 states that the farms are small, that one man on the Fort Apache Reservation has several plots totaling twenty-two acres, but the average farm does not run to more than five acres and that of this only about onethird is cultivated at any one time.

The following figures are averaged from plats in the Whiteriver agency which were made in 1943. Boundaries and areas are substantially unchanged since then. On the Middle Fork Cedar Creek ditch there were twenty eight farms with a total acreage of 40.19 acres, or an average of 1.44 areas per farm. The largest farm here was 4.9 acres, three were between 2 and 3 acres, ten between $I$ and 2 acres, 14 were less than 1 acre. On this ditch one man owned 5 plots, four owned 4 , two owned 2. On the East Fork Cedar Creek ditch there were 18 plots with a total of 29.05 acres, an average of 2.42 . None on this ditch owned more than one tract (though several of these owners and those on the other ditch also owned plots in the Canyon Day area). Two farms here were between 4 and 5 acres, two between 3 and 4 , two between 2 and 3 , five between 1 and 2 , and one was under 1 acre.

On both Cedar Creek ditches there were 40 plots

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41 \text { Opler, Fort Apache Report, p. } 34 \text {. }
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totaling 69.24 acres, an average of 1.73 acres. No figures were obtained on the dry farms of the area, but most of those inspected would certainly not exceed five acres.

At Canyon Day village there were four ditches with 93 plots totaling 130.41 acres, an average of 1.4 acres. Some owners held more than one tract. Of the plots on these ditches, 6 were under $1 / 4$ acre, 8 between 1 and 2 acres, 9 between 2 and 3 acres, 5 between 3 and 4 acres, 1 between 4 and 5 acres. The smallest was $1 / 5$ acre. One school farm had 13.7 acres.

On 13 North Fork ditches there vere a total of 97 plots, totaling 425.72 acres, or an average of 4.39 acres per plot. Included in this North Fork area vere an Agency Farm of 26.10 acres, a School Farm of 25.68 acres, and an Agency Orchard of 8 acres. If these are taken into account the average individually held plot was only 3.88 acres. Iwo individuals held farms between 13 and 14 acres, one had between 12 and 13 , one had between 10 and 11, two had between 9 and 10 , one had between 8 and 9 , nine had between 6 and 7 , several had over 5 , most held way under 5 acres. This data on ivorth Fork as to size of plots and number of different sizes is taken from 5 sheets showing perhaps 8 or 9 of the 13 ditches.

No data wras obtained for the Cibecue area and none was availabile on East Fork or Turkey Creek. However, by visual jinspection the farms at $C_{i b e c u e ~ a n d ~ o n ~}^{\text {a }}$ the East Fork were judged to be no larger on the average than those on Noreth Fork.

There weres in 1943 in the plats examined a total of 230 irrigated tracts of ground in the Cedar Creek, Canyon Day, and North Fork areas, with a total of 625.37 acres. This avemages to 2.72 acres per plot. If one takes into account four Agency and School farms totaling 73.95 acres, the average of the individually held plots is reduced to 2.4.4 acres. This is an estimated average size for the farmis which are so much larger than those of pre-American times.

There apperars to be no great desire for large or numerous farms amcong the Apache. According to Opler, ${ }^{42}$ nearly every Apache framily on the Fort Apache Reservation does a little farming under normal conditions. Not all the cleared lands are cultivated. There are numerous abandoned plots west of the Cibecue, at Forestdale, and other places on the Reservation, as well as virgin lands, which could be occupied by the ambitious. The Apache does not appear to be driven by the land hunger so

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42 \text { Ibid., p. } 34 .
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characteristic of many Anglo-Americans or to desire to possess or use more than enough to meet the needs of his family. As one Councilman stated, "We have five acres (which included a large home site). That's enough. We don't want any more."

Irrigation. There appear to have been yearly and cyclical fluctuations in water supply. It is known that a drought about 1864 forced the abandonment of many farm sites in the Bear Springs area. Nevertheless, informants stated that drought was never so prolonged or so severe as to cause hardship or crop losses. It is quite possible that memory of such losses or hardships has faded.

One man could remember a season when the North Fork of the White River was high enough to float logs, While his mother-in-law remembered a season when she could step across the North Fork at any place.

Springs were at one time much more numerous than at present, many having dried up during the last seventyfive years. There was never, apparently, any ownership of springs. Whoever camped in their vicinity used them and cleaned them, when necessary, with hands and gourds.

The Apache believe that they have irrigated as long as they have farmed, and it is certain that they
have irrigated for over 200 years. 43 They also state that the irrigating technique has always included the use of dams. Irrigation is so much a part of the Apache agricultural complex that, except for favorable areas where seepage provided moist subsoils or some of the higher areas where there was plentiful rainfall, it was unthinkable to farm without irrigation. Farm sites were picked primarily for their accessability to water. In the upper Canyon Creek area, where irrigable farm land was scarce, no dry farming was attempted in former times, though such farming is possible.

Water was led to the fields by ditch, with or without the aid of dams. Fields were irrigated on the flat without ditching them. Where shallow ditches were made ahead of the water to lead it to desired spots, these were later levelled when the watering was finished. This is still done in unfurrowed fields.

Fields were levelled and kept level by transporting soil from high to low places and by throving soil from high spots into the water, which distributed it to the lower areas. Very low spots were filled with brush, grass, and earth. A digging stick was the only tool used.

43 Thomas, Forgotten Frontiers, pp. 32-33.

Ditches were dug from springs or stream banks. Usually they were shallow and short. As they were dug, the water was led along to establish a proper level. Large rocks were pried out with sticks, two or four of these often being used in unison as crowbars. If necessary a large rock was split by the application of fire followed by dousing with water.

The longest ditch informants remembered prior to the military occupation was one at Cedar Creek which served some thirty families and was about two miles long. Goodwin ${ }^{44}$ states that from five to fifteen farms might be served by a ditch.

When the irrigation season arrived, ditches were cleaned and the vegetation along their sides burned. They were kept free of weeds during the period of use. Bear grass and gramma grass weighted with rocks were used as head gates and lateral gates.

Dams were not always necessary. Where used they were usually not true dams but short diversion dikes projected part way across a stream. All five dams serving the upper Canyon Creek area in the 1880 's were of this nature according to informants. Dams were made when the water was low. Brush was first laid down, then

[^9]bear grass (Nolina microcarpa) placed against it on the up stream side, then next a layer of gravel was piled on top, then earth, then more gravel, etc. Women and girls filled burden baskets by hand with earth, carried them to the dam and dumped them. Breaks in dams were repaired with brush and earth before each irrigation. The White Mountain built dams with willow, bear grass, gramma grass, gravel, and earth. Juniper trees were used in the construction of large dams. These were dragged to the site by horses and covered with stones, brush and bear grass.

The narrator in Goodwin's Experiences of an Indian Scout ${ }^{45}$ describes a dam built at Cedar Creek, presumably in the $1860^{\prime}$ s if the text is interpreted correctly. However, some of the technique smacks of military engineering. First a series of totrapods was set across the creek in line. These were made of four poles driven into the creed bed and had a base about three feet across and a height of three feet. Between the tetrapods rocks were placed, men doing this work. Then bear grass and dry bark were tied into the tetrapods in bundles. Bear grass was laid lengthwise along the upper side of the tetrapods from one to another.

[^10]Over the bear grass was packed dry inner bark of cedar and cottonwood, both men and vomen working. This inner bark was pounded soft and wadded in. In front of the bear grass a wall of flat stones wass built as high as the tetrapods. Between this wall and the bear grass was a space which the women filled with gravel and dirt. The whole task took two weeks. The dam was watched and if a leak appeared it was repaired.

Fields and gardens were never watered by hand. Irrigating was considered a woman's job, though anyone might do it and men often helped. If there was sickness in a family, they might ask a friend to irrigate for them or a chief might request someone to help them. Neighbors assisted each other to conistruct dams and ditches. These were considered community projects. In some localities farm owners were notified by a "ditchboss" when ditch or dam work was necessary. This was usually an elderly man who took a special interest in farming, supervised such work, and apportioned the water. ${ }^{46}$

When hoeing and irrigating, crops were sometimes addressed. The Cibecue said, "Grow fast, don't bother it worms, make a good crop." The White Mountain always

46 Goodwin, Western Apache, $p .156$.
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prayed when irrigating.
People struck by lightning can irrigate and do all farm work other than planting, according to the White Mountain, but an incident was told of a Cibecue man forbidding his wife to irrigate because lightning had struck her camp.

When water was turned in the ditch, the head man of a community received it first. 47 The chief Diablo was at the end of his ditch and got the water last of all, thus obtaining more time to irrigate. 48

Occasional quarrels which developed into killings arose over land and water at Oak Creek. Usually such quarrels were composed by chiefs or influential men. Goodwin ${ }^{49}$ stated that water disputes were usually regarded as women's quarrels. A chief or man of influence might break a dam and turn the water from the ditch if his intervention failed to stop the wrangling.

The military and civilian agents encouraged and assisted in the development of irrigation projects in the $1870^{\prime}$ 's and subsequently, partly to keep the Apache occupied and provide a substitute for the meats and wild

[^11]plant foods they were no longer freee to forage for, partly to make possible a concentmation of population near the post at Fort Apache, wheree they could be kept under closer supervision.

Parts of these projects appeiar to have been poorIy planned, as they did not supply the expected water and some ditches quickly washed out because of improper construction and poor engineering. In the Oak GreekCanyon Creek district prior to 1891 the agency constructed ditches along the hillsides in order to provide everyone irrigable land. But there was never enough water from the spring they thapped.

During the CCC period of the New Deal many improvements were made in the irrigattion facilities, but these were severely damaged by the heavy rains of 1941 and have not been repaired.

The author saw some small drum and ditches, built or renovated by individuals, which showed evidence of considerable hard work. The Apacho took pride in this accomplishment.

Erosion has taken a heavy toll of farming lands, particularly in the western part of the Reservation. Much good land on the Cibecue has washed away, some at Cedar Creek and Carrizo, and all of the irrigable land at upper Canyon Creek. Streams which had supplied water
at Canyon Creek and at Cedar Creek have so deepened their channels as to make diversion impossible. Others have eroded below the water tables they once tapped. Most lands at Carrizo are now not irrigable.

Part of this is undoubtedly the result of more intensive use and clearing of land, and the intensive grazing which followred the military occupation. White lessees overgrazed the Reservation and much of the natural grasses and vegetation cover was destroyed. The Reservation is still grazed heavily, within its capacity.

Flood-water, Irrigation and Dry Farming. The Apache did little farming where irrigation facilities or moist sub-soil were not available. Informants stated that there were good dry farms where corn was raised around Blue House Mountain in the Cibecue territory in the early 1860's and before. In the Forestdale area com, beans pumpkins, and melons were successfully raised without irrigation before the district (except for one or two families) was abandoned.

At Oak Creek lands were dry farmed after 1891, in which year the ditches and many of the farms were washed out. Although there had never been enough farms at this location, no attempt was made prior to this time to plant where water was not available. At the
present time lands are dry farmed at Cedar Creek which were at one time under irrigation. The same is true of some of the farms on Carrizo Creek.

Formerly there were a number of spots where moist sub-soil from river, springs, or seeps assured good crops. In the Bear Springs area between Cedar Creek and the White River there were several such areas. A drought in the mid $1860^{\prime}$ s forced the evacuation of most of these. At one time there wore many moist areas along the hillsides at Cedar Creek which were planted, but these have dried up. The San Carlos band in preAmerican times, raised little patches of corn, wheat, and pumpkins in the damp soil along the river bottom of the San Carlos River, according to Goodwin. 50

Some five or six generations ago small dikes were built of rocks and earth in the Bear Springs area to divert rain run-off onto the fields. Small dams were also built across dry arroyos before the rains and the water thus caught was let into the fields.

On Salt Creek above Cibecue, where the land is dry, ditches or dikes were used to divert the run-off after rains. These hill farms are only sporadically planted now.

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50 \text { Ibid., pp. 30-31. }
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In the East Fork area, where the farms are irrigated, one energetic women attempts hand irrigation after rains. Few others do. This failure is ascribed principally to laziness but also, in part, to fear of being outside during a storm, as this is tempting or disagreeable to Lightning.

It was denied that any attempt was ever made to use run-off waters in any of the areas of the Canyon Creek Band. A Cherry Creek man stated that irrigation was always necessary in the lower country, but that in the high country there were some dry farms.

At the present time the Government Farmer at Whiteriver, Mr. Maxwell, is encouraging people to plant corn and beans on dry lands.

Division of Labor; Helpers; Attitudes. The Apache, both men and women, liked to farm. Hard work and industry in farming, as in hunting, gathering, basket-making or any other economic activity, was an ideal. Chiefs in their daily morning talks exhorted the people to work hard and, during the farming season, such talks always included admonitions to do the necessary farm work, to raise large amounts of corm, to help each other.

While there was a feeling that farm work, especially after the planting, was women's work, there
was nothing degrading or menial about it. There was nothing, in other words, which would prevent a man from doing it, and, when available, men did participate in all types of farm labor.

Women perhaps took a more serious view of farming than did men. One man stated that "in the old days the woman was the head of it; the man he don't much eare; the man, he's apt to make the mistake; women have always been the better farmers."
"Just as among whites some were too lazy to farm. Some who had farms would not work them. Some would rather go out and hunt, but some were too lazy to do anything and vere always begging food."

Preference as to working hours varied. Some preferred to work before sunrise, then breakfast, then until it became hot. About four or five in the afternoon they returned to the fields and worked until dark. Some women, older children, and men rose before dawn to work. Others preferred to wait until after breakfast. Old people definitely believe that the Apache worked harder and more conscientiously in former days than they do today. They were said to go farther to plant, and to keep their fields better. Today many fields are untended because both men and women "like to ride around" or "go some place and drink."


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The Apache does not evidence a desire to raise more than necessary for his own needs and shows little interest in improved methods of cultivation. Opler 51 believed that the reason for this is the lack of a market for Apache products. The traders and the agency do not buy the Apache produce, though some of the traders will buy beans on occasion. Fresh vegetables are supplied to the traders by the missionaries, by school farms, and by outside truckers. One Apache, encourage to raise a field of potatoes, could not sell or give them away. Therefore the Apache are inclined to raise only what they need and for this the traditional methods are sufficient. It is also quite possible that the lack of interest in improved methods is a matter of cultural values on goals.

The agency has vacillated in their attitude toward agriculture for many years and this has been discouraging. Farming lapsed during the Roosevelt administration when the work relief program and road work and later the war allotments provided cash incomes. Goodwin 52 states that the dignity of sub-chiefs and wealthy men placed them above certain types of

51 Opler, Fort Apache Report, p. 34.
52 Goodwin, Western Apache, p. 166.
menial labor and that they did not work on their farms, but hired poorer people to help. To a certain extent and in some local groups this was undoubtedly true. On war parties and hunting parties the older and more influential men were exempt from such tasks as wood gathering and water carrying, which were performed by young men or novitiates. But there was no feeling that physical work of any kind was in any way demeaning.

In regard to economic pursuits, informants indicated that chiefs and men of influence felt a compulsion to set an example of hard work and industry. The chiefs Lupe (F I) of the Cherry Creek district and Dazy (N I) of upper Canyon Creek were said to have "worked all the time" in their fields. "Chiefs always worked the hardest." Dazy was the only man in his district to attempt the raising of sheep and chickens and to grow cabbage after the military occupation. Among the White Mountain a chief would ask people to plant his field. While they were planting he would help cook the deer he had killed to feed them. Afterward he would work in his field. Most of the White Mountain chiefs worked hard and set a good example for the younger men. Diablo on East Fork, perhaps the most influential chief of the Eastern White Mountain at the time of the military occupation, did not do farm
work, having captives at his camp who helped his family and dependants. Alchise, on North Fork, had the reputation of making his people work for him.

Chiefs always set the example in economic activity. They were the first to return to plant, or to harvest. Some took an active part in directing these activities, sending certain men out to hunt, some to gather, some to plant. At Cedar Creek Crossing the chief "Hàcki. ýkè. d" directed in this manner and appointed some to plant for those he had sent on hunting or gathering missions.

Among some local groups elderly men who took special interest in farming and who usually possessed agricultural ritual were called "ditch bosses." They notified those sharing irrigation facilities when communal work was necessary, arbitrated disputes, apportioned water, and sometimes stayed at a site through the summer to watch it. At times they were hired to make the first ceremonial planting of a new field. 53 Goodwin states that such ditch bosses are no longer to be found on the San Carlos Reservation, the men in charge of the ditch being government employees. 54

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& 53 \text { Ibid., p. } 156 . \\
& 54 \text { Ibid., p. } 192 .
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On the Fort Apache Reservation men are hired to keep the ditches in order and to supervise their use. On the Cibecue the foreman is known as the "ditch boss" and this position appears to carry with it considerable prestige. He suggested to an owner what work needed doing and exhorted people to water when it appeared their crops were being neglected. It is difficult to determine how much of this prestige derives from the sanction of Apache tradition and how much may be due to his own superior qualities and from his being the direct agent of the local government farmer.

Some women had great prestige and influence and were known as women "chiefs." These would take the lead in organizing farming and gathering activities among the women of their economic units. They were usually wives of chiefs, but not necessarily. ${ }^{55}$ In a household the first wife was recognized as the female head of the encampment and directed the work to be done, including farming and food gathering. At her death the second wife normally took over, but this succession could vary. ${ }^{56}$

In former times men did not always participate

55 Goodwin, Social Divisions, p. 57 ; Western
pp. $167-68$.
Apache, pp. 167-68.
56 Goodwin, Western Apache, p. 356.
in agriculture. Raiding and hunting took them away from home much of the time, leaving all agricultural activities to the women. When not otherwise engaged, however, they often helped with all forms of farm work. As a rule they did the heavy work, or at least helped with it, in connection with building dams, digging ditches, and clearing and preparing a field. Some of the White Mountain informants stated that they did the planting or always helped with it. Among the Cibecue women frequently did all the planting, and among the White Mountain a "Iucky" woman might be chosen to drop the seeds after men had dug the holes.

There were no restrictions by which men or women planted different crops. Older men who were no longer able to engage actively in the chase helped in all farm work. Young unmarried men very frequently helped girls with their field work, the couples working side by side. 57 Goodwin 58 states that men helped only in the preparation of fields, planting, and at times irrigation. The author's informants indicated that at times they took part in every agricultural process.

Women engaged in all agricultural work and were,

57 Goodwin, Myths
p. 288 , and $\frac{\text { Tales }}{p p \cdot 3} 30-31$. p. 99 f.n.; Western 58 Goodwin, Myths and Tales, p. 71 f.n.
in former times at least, considered to be better farmers than the men. If earth were to be carried, for building dams, it was the women who transported it in baskets. Women were more apt to possess the knowledge of agricultural ritual connected with planting (aropping of seeds) and irrigating. At the harvest and after, they usually selected the seed and put the com in the caches. Winnowing in baskets was done by women. Old women usually taught the young people how to farm. Men have taken over a much larger share of the agricultural labor since the Reservation was established. For one thing, war and the chase no longer require their time. The use of the $p l o w$ and horses and sometimes more complicated machinery is too heavy and too difficult for women alone, though they may work in conjunction with them. Irrigating, harvesting, and weeding are still performed very largely by women, though men help much more than in the past. 59 Goodwin 60 states that it was not until after marriage that youths and maidens entered upon their full share of farm work. Boys and girls of this age were not allowed to help in harvesting, because they

59 Goodwin, Western Apache, p. 372.
60 Ibid., p. 473.
were likely to be careless and spoil good ears in stripping them from the stalks.

In a local group at Cedar Creek Crossing boys and young men apparently did not help with farm work. They gathered along the sidelines to watch the men plant. In all other groups of which the author had direct information the whole family might help in planting and harvesting. In this, however, children did light work covering up holes. Probably, in most cases, they worked because they wanted to and to take part in the family activity rather than from any compulsion. Old people, who had difficulty in travelling, were frequently left at a farm site. Captives sometimes did part of the farm wrork or were left behind to help the old people with it.
often, during the preparation of a field, planting, and harvesting, a whole family worked together. Relatives, affinal relatives, and neighbors often helped. Where fields were planted one after another, or a number of people worked at a task, it was not necessarily relatives who worked together (though there were greater obligations for relatives to help one another), but all neighbors.

An exception to communal effort was noted in White Mountain harvesting, where one man stated that
only the owning family harvested. It seems certain, however, that friends and relatives and share-helpers might at times assist in this.

Relatives who would be expected to assist a family in its farming operations were brothers, brothers-in-law, nephews, uncles, and clan siblings. One cibecue informant stated that brothers did not help and were not called upon for help, the implication here being that a brother's obligation would be greater to his wife's family and that they would be entitled to all his labors. Another Cibecue group man qualified the statement that brothers-in-law would help with the phrase "if they were friendly."

A man's own father and mother might assist him. His sisters-in-law would usually help and also his father-in-law and mother-in-law. A man always helped his wife's parents in any work in which he was needed and was also expected to help her brothers and sisters. Where a son-in-law and mother-in-law worked in the same field the tabued relation between demanded that they work a distance apart (perhaps fifty feet). If there were no corn or brush between them they worked with backs to e ch other.

Sometimes a woman worked alone; occasionally two people; at other times a whole family; sometimes a group
of relatives and neighbors. When youths courted the maidens in the field, as many as four couples might work abreast. 61

Often a request for assistance was made at planting or harvest. On other occasions helpers appeared of their own volition and offered their services. It appears to have been the prerogative of those without farms or crops to help those who possessed them for a share in the produce, and it seems that those with big farms or crops felt an obligation to accept such assistance. Chiefs in their morning exhortations admonished those without farms to assist those who had with planting and harvesting.

Families without com, whether they lacked land or because they had remained south at the gathering grounds too late to plant or were too lazy to plant, would work for others. Whoever had the largest crop received the most help. This worked a hardship on the farmers in such an area as upper Canyon-Creek, where they were out-numbered by non-farmers nearly five to one. At harvest time there were "too many people to help."
"Poor" people sometimes worked for a "rich" man

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61 \text { Ibid., p. } 288 .
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"just to eat." When a family worked for another or for a chief, they were given food for their immediate needs but none to take home; "when it got ripe they would let them have some -- not much." At other areas helpers kept green ears, or nubs or poor ears, or ears from which the husks were stripped, and later were given one or more bundles of large ears when the harvest was transported to the owner's camp.

Goodwin ${ }^{62}$ stated that some forty per cent of the White Mountain did not have farms, but could obtain produce in return for planting, tilling, or harvesting for wealthy men with large farms who solicited labor. Elsewhere ${ }^{63}$ he speaks of wealthy men and chiefs hiring helpers for produce or for cooked corn which they took home in pots or baskets. Chiefs might support poor relatives who in return worked for them.

Whereas some helpers were hired to help, in many cases help seems to have been given in a spirit of friendly neighborliness. A local group often operated as an economic unit. Families were notified when planting time came and two women ground corn to feed all

62 Ibid., pp. 151-152.
63 Ibid., p. 166; Myths and Tales, p. 99 f.n.;

helpers. Help was given on a reciprocal basis. Fields were planted in rotation in this cooperative manner. At present helpers are notified, "I got the tulapai (corn beer)," and this is all they are given. They may drink part or all of it on the spot or take it home, as they wish. It is not unusual for an Apache to hire another for cash to herd his cattle, get his horse, haul wood, trim fence posts, and do other jobs. One man was recently given half a sack of acorns, about fifty pounds, for vatering another's beans while he went gathering.

There was some exchange of farm products for meat or hides. Sometimes this was a formal transaction, i.e., a basket of corn for a buckskin. Oftener the trade was informal or amounted to an irregular exchange of gifts. While non-farmers frequently gave meat for agricultural products, they did not make hunting a profession or attempt to specialize in furnishing animal products.

The author has seen families in the field with a mother-in-law (because of the tabued relation with her son-in-law) by herself in a far corner; brothers-in-law plowing together; a father-in-law with several resident sons-in-law hoeing corn. An East Fork woman of great ability and energy with good farm property kept several men busy clearing a new field, building up a wood pile
for the winter, and other chores. Every now and then people would come for food or ask for corn. The workers included, among others, her son-in-law, her husband, and an orphan boy. This boy stated, "She is awful good to me. She helps me a lot. I like her better than anybody."

There is still a feeling that the "wealthy" should provide some employment for poor. A trader, descendant of a chiefly family, is often reproached for doing his own work (driving and loading and unloading a supply truck for one thing) when he could so easily hire it done.

Implements. Digging sticks of varying length and shape were the former agricultural implements. Oak was considered the best wood. Green sticks were run back and forth through the fire and heated to straighten or bend them into the desired shape. The end was sharpened and hardened in fire. There appeared to be no use of abrasive stones in sharpening a stick. There were no footrests or auxiliary handles.

One all-purpose digging stick used in the upper Canyon Creek district was described as about sixty inches long and slightly crooked in the middle. In this district short sticks were sometimes used as well as long ones. Digging or punching of holes was from a
standing (with the longer stick), or kneeling position. For hard ground a rock was sometimes used to hammer the stick, which was then prized up; this was usually done with the short stick and from the kneeling or sitting position.

Digging sticks used in the Cherry Creek district were described as from thirty to thirty-six inches long and round like a hoe handle except on one end, which was sharp and flat for a few inches. This was used as a weeding hoe, the farmer resting with right knee to ground, right hand high on stick, and gouging to the left. This stick was also used for digging ditches. In planting the same stick was used, or one somewhat more rounded at the end. When planting a hole was dug while kneeling on one knee.

The East Fork digging stick was of oak, about forty inches long, but heavy. It was chisel shaped on one end. The operator forced the point of the implement into the ground next to his knee on the left side of the body. Weeding was done from the same position. Digging sticks were sharpened with a "hatchet stone" and hardened in the fire.

On Cedar Creek a thirty-six inch digging and planting stick was described. It had a chisel-shaped end. This also was demonstrated with a side motion to
the left.
Goodwin ${ }^{64}$ states that clearing and tilling was with a digging stick, seeding with a planting stick. Often, all operations were performed with a single allpurpose stick which, with its slightly chisel-shaped or flattened end, could be used for clearing, digging, scooping, punching, and even weeding.

A flail was used for harvesting. Those used to harvest beans were six feet long, not too thick, and used either from a sitting or standing position, but usually sitting. Only the one size of flail was used. In shelling corn a six or eight foot flail about one and one-half inches in diameter was used.

The Apache did not use the Hopi-type rake or fork for removing com stalks from the field but employed the limb of an oak tree.

Metal hoes were first obtained, according to tradition, from the Pueblo Indians north of the Mogollon Fim and later from the Mexicans. Shovels were acquired in the same way. Tools were few and highly valued. Often one or two implements were used by a whole community. The scarcity and value placed on them is illustrated by the statement of a Cherry Creek man that the

64 Goodvin, Social Divisions, p. 63.
"poor always" came to "rich" men or chiefs for agricultural products, not necessarily because they had no farm but because they lacked metal tools to work it -"maybe they got land but no hoe, no axe, no tools."

The military and agency officials first introduced the wagon, plow, and other modern farm implements among the Apache. They also distributed shovels, hoes, and axes in greater number and probably introduced the sickle, rake, and pitchfork.

Wagons and harness were issued from time to time after the establishment of Fort Apache, 1869. Palmer 65 states that about 1890 the government provided the Indians on the Fort Apache Reservation with 150 wagons and two sets of single-set harness to each wagon. In 1948 the author watched the agency blacksmith and his helper, both Apache, making a wagon box to order, including the metal strapping and bolts. This was to cost approximately ten dollars.

Plows were introduced at an early date in the American occupation. The first to be used at Canyon Creek, the farthest west and most isolated farming community on the Fort Apache Reservation, was issued from Whiteriver Agency in 1885. Plows quickly replaced

[^12]shovels and hoes for groundbreaking, as these had previously replaced the digging stick. Now when helpers come to assist a man they arrive with plow and horses.

Harrows are used to some extent, though a log drag or section of brush is still used as a substitute. Cultivators, mowing machines, rakes, and other farm machinery are not widely owned.

The Apache use of farm machinery is somewhat different from that of the average Caucasian famer. Plowing is usually done with a single horse, sometimes a pair. In all plowing observed a rider or driver was present in addition to the ploughman. When hitching a team, the Agency Farmer stated, the Apache is as likely to hitch a mixed team of a horse and a mule as a matched team, even though two or more well matched horses or mules are available. Many wagons are damaged by the practice of hooking the traces before attaching the yoke to wagon tongue. The Farmer stated that "the Apache are still primitive farmers."

Pests. Old Apache agreed that weeds were less troublesome formerly than at present. They stated many have been recently introduced (since 1900). These included the tumbleweed, cocklebur, Johnson grass, two or three varieties of morning glories, and others unidentified. Formerly weeds were pulled and thrown clear of
the field and later, when dry, burned. Now weeds are left lying where pulled or hoed. This may account for part of their greater prevalence today.

Corn smut or other plant diseases were never troublesome. Diseased plants were not removed.

Insects were said to be much more troublesome at present than formerly, According to the white Mountain the most effective means of ridding a field of insects was to perform a rain ceremony to "wash them off." Cibecue informants stated that there were once religious practitioners with power to make insects leave a field by singing and praying and "talking to them."

Ashes were formerly sprinkled on plants attacked by insects. Wood, preferably oak, was burned beside a field to produce such ashes, which were then sprinkled on the plants by hand. Ashes (any kind of wood ashes) were mixed with shelled corn in storage to repel worms. This was done only occasionally and by only some of the people. Some still do this. A more effective means of keeping corn free of worms was to store it on the cob.

Smoke was an effective agency in repelling a long, flat, squash-shaped flying bug. Logs, dried weeds, and yucca were fired to the windward side of a field to produce the smoke. The stubble was never burned to eradicate pests.

Certain ritual methods of eliminating worms and insects are still followed. One of these is to collect worms in a jar of water, allow them to rot, then sprinkle them over a field. To repel grasshoppers a "boss" grasshopper (a vari-colored variety) and four other varieties were caught, wrapped in wild gourd leaves and tied with yucca string. These were carried to some distant place (as from East Fork to Carrizo). It was believed that the remaining grasshoppers would leave.

Crickets were considered the "music of the crop" and were never intentionally injured. If one were accidentally stepped on its forgiveness was asked. During cold weather crickets seen in exposed positions were picked up and placed in brush "where it was warm." Prayers were addressed to crickets requesting them to "help" with the crops. Informants stated that when the crickets made a unique sound on a particular day, it was mandatory for the hearer to make green corn pudding. In the autumn the crickets were said to make a sound equivalent to the Apache words "it's time to harvest."

Formerly beans were free from pests, but at the present time the Mexican beetle is extremely prevalent. The Agency Farmer provides dust for those who will use it. The early type of Apache beans and large white beans, when planted beside pink beans, were said not to
have been bothered by insects. Formerly there were also few squash bugs.

The Apache picked insects from beans with their hands and crushed them. The nests of a red insect with black spots, which were made under the leaves of the bean plant, were also crushed. A flat "stink bug" was removed from the pumpkins. A very small flying insect attacked watermelons.

The earliest plague informants recalled was of huge green grasshoppers, "a different grasshopper," which ate the corn, small yucca, and leaves from all the trees in 1916 or thereabouts.

Cut worms were not pulled from the corn roots. According to one White Mountain man the se were not present until recent times, and the only pests which destroyed the com were those which ate the silk.

Ants were considered a nuisance because corn would not grow near their nests. To get rid of them a hole of about 1700 cubic inches capacity was dug in the field and filled with hot water. "Ants would run in and drown." The Apache did not urinate on ant hills since they believed that this angered the ants and that the offender would later be stung in retaliation. Miner's candle roots and leaves of other plants mashed up were formerly soaked with corn before planting.

It was believed that a gopher which ate a grain of corn so treated would swell up and burst. This is not often practiced at present and according to one religious practitioner man it is "no good." Earth from the center of a gopher hole was sometimes soaked with the corn prior to planting to prevent gophers from eating it. When the land was irrigated gophers were sometimes drowned. Water was led to all holes seen. If recovered dead gophers were eaten. Rats and squirrels were killed in the field with rock deadfall traps. Formerly most Apache possessed songs and prayers efficacious in preventing damage to crops by wild animals. Nevertheless, bears, dear, coyotes, raccoons, and skunks were at time troublesome. Various practical measures were taken to keep animals away. During the day the presence of women in or alongside the field as they made baskets or dressed skins was usually sufficient. A ramada or a tree platform was often erected from which to watch for bears, which were shot if necessary. At night a single fire was built on a hill above the field or fires might be built all around the field about fifty yards apart to frighten away animals. If this did not suffice, juniper torches would be carried into the field to drive animals away. Children sometimes stayed in the middle of a field and made noises with sticks at
intervals throughout the night. When corn reached the roasting stage a family might move to the edge of the field and hurl stones in it until the middle of the night.

Corn chewed or in any way disturbed by bears, coyotes, and other animals was eaten only by elderly people. Young people feared to eat it, as it was believed that it caused sterility.

Dogs never molested the crops. They were not trained to guard fields.

Formerly when caching food it was customary to say: "I bury my corn here, don't nobody bother, don't coyote or bear or anybody dig it out; if you see him you change his mind." It was not learned to whom this prayer was addressed or other informantion about it, for the informant had heard it as a child while watching the filling of a cache.

Bluebirds, blackbirds, and large crowis (ravens) attacked the corn. Farmers camped in the fields to frighten them. Birds were not caught with corn pierced by a horsehair as among some tribes. Dead crows and bluejays were nailed to posts in the fields to frighten others.

Scarecrows were used by the White Mountain only at the time the corn was drying. These were gramma
grass scarecrows made in human shape and placed on top of ramadas. Yucca string "clotheslines" with strips of yucea hanging from them were also used. Later muslin was substituted for yucca. Some are still used when the corn ripens.

If an eagle or hawk should eat its kill in a field, the nearby corn is not used or even approached closely, as it is believed to cause insanity, headache, or a twisted mouth. Many children were said to die from contact with corn of this type.

Fences were not erected until after the introduction of the horse. A recognized code of setting damage to crops by livestock was developed. The owner of an animal caught in a field was sent for and payed a blanket, buckskin, or other property according to the amount of the damage. This was usually paid willingly. An animal caught repeatedly in a field might be killed and eaten by the owner, but could not be retained alive for his use. If a fine vere not paid the animal might have its tail and/or ears cut off. An animal belonging to a poor woman might be released and no damages asked. On the rare occasions when an owner of an animal refused to pay damages the case was taken to a chief or other
influential man for settlement. 66

Clearing and Preparation of Pields. Clearing was done with fire and digging stick. Brush and grass were burned. The Wite Mountain believed grass ashes good for their corn. Some brush was pried out with the aid of a digging stick and willow roots were pried out of the ground in this manner. Trees were formerly left standing, for people liked a shade tree or so in a field. Now they may be girdled or felled.

Small stones were removed from the field. Large ones were left and planting done around them as around large trees. Some of the White Mountain left stones in their fields, claiming that they helped the corn.

Formerly soil was broken with a digging stick, later with a shovel. This was done in February or March when the ground thawed. Before planting, a field would be thoroughly soaked and the weeds removed by hand.

In preparing to reuse an old field, corn stalks were broken with the feet or pulled by hand, then raked into piles with an oak branch and burned. The ashes were left in place, not scattered. If grass covered the field, it was burned.

66 Goodwin, Western Apache, p. 387.

Corn: Seed Selection. In general, seed was selected by women. One informant stated that only women selected seed, but others stated that at times a man, or both man and woman together, might do this. The "leader" seed was selected ceremonially at harvest time. At the beginning of the harvest the white Mountain went into the middle of the field and chose the tallest stalks with two or three ears. It was desirable to find stalks with four ears, but those with only two or three ears were acceptable. Eight were selected and these were piled in the pattern shown in the accompanying diagram, which "stood for a cross." (Fig. 1.) The ears were then pulled from the stalks still standing in the field and piled in the center of the cross. Later all eight stalks or only the ears were taken home. These were the "leader" of next year's seed and were stored in a ground cache (now inside the wickiup). After picking the eight ceremonial stalks it was necessary to find four ears of the "flat-headed, small, female corn," at least one ear of which was included in the seed selected. The remainder of the seed was taken from the largest ears and tallest stalks. This selection might be made either in the field or at camp. Contrary to the Cibecue practice, the White Mountain did not sprinkle corn smut on the "leader" seed.


Figure 1

$E$

Among the Cibecue only four ceremonial stalks were selected. These had two ears each, sometimes a third ("just a little fellow"). Two of these stalks were placed in an east-west alignment, the other two were oriented north-south to form a cross as shown in the accompanying diagram (Fig. 2). Then the remainder of the crop was picked and piled on these four stalks. Dirt from a gopher hole was sprinkled on the pile east to west, then north to south to produce a cross. The loose ears were tied together. The four stalks were tied in bundles of two and carried to camp. There the ears from the four ceremonial stalks were removed and saved to mix in with other seed. Corn smut was sometimes sprinkled over the ears from the four ceremonial stalks just before planting.

Goodvin ${ }^{67}$ describes, in a myth recorded from an Eastern White Mountain woman, the placing of four ears of corn, the largest and best, on the ground at harvest time. Each was placed pointing in a cardinal direction, butts to center. The rest of the crop was piled on these ears. Goodwin's footnote explains that the four ears were placed there to stand for all the corn, that it all might be as large and fine. No mention is made

[^13]of their use for seed. However, such use seems probable. In general large or long ears were selected for seed. Sometimes these were picked from the tallest stalks or from stalks with the most ears. One informant stated that they were sometimes taken from the earliest maturing stalks. But as seed corn was selected, more often than not, after the harvest had been removed to camp, it seems doubtful that selection was often or consistently made on the basis of size of stalk or number of ears per stalk except in the case of the "leader" seed.

Tabus or preferences in the use of twinned and forked ears for seed varied. At Cherry Creek twinned ears were liked for seed, but not forked ears; however, both could be eaten. At Oak Creek both twinned and forked ears could be used for seed, but neither was eaten for fear such corn would make one ill or insane. The White Mountain used neither for seed, but ate both.

Most informants stated that for seed corn kernels were used from all parts of the cob, provided they were sound. The shape of the kernel made no difference, though its size might. All except one stated that kernels from straight-rowed ears only were used; one said this did not matter.

The majority of the Apache preferred blue corn,
though red and the soft variety of white were also popular. Black was not saved for planting, as a rule. Flour corns were preferred over flint. Some made a practice of saving only one favored color, some saved several colors or all. Most preferred to plant several colors. Among the White Mountain, where colors were planted in separate fields, the varieties remained true, but the Cibecue, who planted but one color to the row but often several colors in the same field or adjacent fields, stated that their corn always grew "all mixed up." Their traditions were that their original corn had been obtained in several colors from neighboring peoples, but that after a few years it ceased to reproduce the colors they planted.

Seed corn was generally stored on the cob, as it was less likely to be attacked by worms. It was carefully wrapped in bear grass and placed below the eating corn in the ground cache. It also might be placed in a buckskin bag. If shelled, it would be cached in an old pitched canteen corked with straw, rock, and mud to keep out insects and rodents or in a sealed pottery jar. Seed and food corn were always stored in separate vessels.

Seed was usually saved for two years or more for fear of loss of a crop, but seed more than one year old was not used if newer were available, as it did not
germinate well. If no planting was done for a year or so, seed might be stored until required or might be eaten.

Color varieties were nearly always stored separately, though they were on rare occasions stored mixed and even planted mixed. If pitched water baskets were unavailable, seed corn might be stored with other kinds of seeds and the different seeds and different colors of corn separated prior to planting. Different colored corn seems to have been stored together where the ears were of mixed colors or where there was only a small amount of corn.

Smut was not removed from seed corn. In shelling seed corn care was taken not to damage the kernels. It was not beaten with a flail, but shelled carefully with the fingers or a cob.

Seed corn was taken to the fields in a pitched water basket filled with water, then transferred to a basket tray when ready for use. If stored in pottery jars, these were simply filled with water and taken to the field.

If seed was known to be good, only a few grains were planted to a hill, but if another's seed was used and its quality were uncertain, a large number of kernels were planted; "then the corn would feed on the
grains which did not germinate."
According to their traditions the Apache secured seed from all surrounding peoples, both friends and enemies. At times they are known to have traded for corn, 68 both with outside tribes and among themselves. Some still beg or buy corn from friends or relatives across the Reservation. Also the military and, more recently, the Government Farmers have introduced corn of unknown antecedents among the Apache. For these reasons it is to be expected that a considerable variation might be found in Apache corn. How "old" some of the Apache corn is is uncertain. It is to be expected that several strains of pre-American corn have survived, since when the government removed the Apache to the Reservation at San Carlos some remained at Fort Apache, who with others in hiding continued to plant in secluded places. Some among those at San Carlos were known to have preferred their own seed to that issued by the government.

Corn: Planting. Corn was planted as early as March to as late as July. In the higher elevations, such as Turkey Creek, it was planted in April in order

[^14]that it would mature before frost. On the cibecue and the forks of the White River, where elevations average about 5000 feet, May was a normal time for planting. Sometimes the White Mountain planted a second crop a month after the first, or when the first had reached a height of about six inches. Such late plantings were made with an early white or sixty-five day corn, not later than the time the cottonwood leaves had attained full growth. There was no special planting of corn to be eaten green.

Corn fields were soaked a night to a week ahead of the planting date. The weeds were all pulled after the ground had dried somevhat. Corn was often planted following a heavy rain. On dry farms it was necessary to depend on such a rain.

The seed was soaked in a pottery vessel, pitched water basket, or skin bag before planting -- a few hours to ovemight among the cibecue, all night before planting by the White Mountain. In former times many soaked the root of miner's candle and/or other plant material with the seed to kill gophers. An item soaked with the seed to produce abundant harvests was the "ears" (buds) of a weed which resembled those of corn. This was called "too many ears." The White Mountain also soaked kernels with earth from a gopher hole and oak leaves to
bring good luck. Now few people soak their seed before planting, and few, if any, add the above materials. In former days corn "come up right away," in about seven days. Now, probably because seed is no longer soaked, it breaks ground after the tenth day.

In former days corn was planted irregularly, "just anywhere." Spacing varied from about twenty inches to eight feet, with an average interval of about three feet. The usual statement given by the Apache as to spacing was "two or three" or "one long step." One man said the white Mountain planted two or three paces apart, but this same man, who had been in the Navajo country, said that Apache planting was closer and shallower than that of the Navajo. At the present time, when corn is planted by hand behind the plow, seed is usually dropped in every third furrow, though this may vary with individual taste and size of plow; some plant every fourth or fifth row.

By the $1880^{\circ}$ s some of the Apache, at least, planted with the digging stick in regular rows with even spacing of hills two to three feet apart. It is quite possible that regular row patterns were planted earlier than this, but no account of it was obtained. Where trees or large stones were encountered, the row was continued beyond them; the obstacle was not circled.

Rows were aligned by eye; there was no marking of guide lines with foot or stick.

Directional planting was affirmed only by those who had used the ritual planting. These (two White Mountain people) stated that it began in the east and continued up and down the field. Helical planting was described as an occasional practice both at Cedar Creek and at East Fork. The first hole was planted at the center of the field, then a hole was planted in order to the east, south, west, and north of this, after which planting was continued around and around in a clockwise direction. Helical planting was recorded by Gifford 69 for the Southern Tonto. There appeared to be no team planting by a staggered row of planters.

Holes were punched, either straight or slanting, or were scooped out with a digging stick. The depth of planting, as ascertained from verbal statement and from the measurement of illustrative holes, was from five to eight inches. The planter stood, kneeled or squatted according to his preference. If the ground was hard the digging stick might be driven in with a stone. The stomach or chest was never pressed on the stick to add

[^15]weight. Holes were often dug at the side rather than in front of the planter. In this case one knee was placed on the ground, the opposite hand at the lower end of the stick. The dry earth was first scraped away, then a hole made in the moist earth. When men worked they dug the holes. Usually the operator was followed by a planter. If a person worked alone several holes were dug, then seeded and covered. The planting stick varied from thirty to sixty inches, with an average length of perhaps thirty-six to forty-two inches. Soil was not loosened below the depth of planting.

Seeds were dropped in any fashion; there was no set pattern of placement or number. Often a "lucky" person, medicine man or woman, with a knowledge of prayers and songs would be sought to do the actual dropping of seed. Anyone so unlucky as to have been bitten by a snake or struck by lightning could not plant; neither could menstruating nor pregnant women. Four, five, or six seeds to a hill was the average number, though statements were made that six or seven, seven to ten, and two or three might be dropped. All agreed that not more than ten would be placed in one hill.

Soil was replaced with the hands, moist first, then dry. Usually it was not tamped, though some pressed
it with the hands or stepped on it lightly if the soil were dry. Holes were filled to ground level. Occasionally a mound an inch or two high was erected. No depressions, were made around the hills, after the manner of modern San Carlos. Children often filled the holes, if it was not done by the planter.

It was standard practice to complete the planting of a corn field in a single day. This was accomplished by the cooperative work of several people, who went from field to field until all were planted. Sometimes different parties worked in different fields simultaneously.

Planting was occasionally done at night, by moonlight, not because of any supposed benefit to the crop, but to prevent the soil from drying out.

If a crop was washed out it was replanted, provided it was not too late in the season.

Most of the Apache agricultural ritual centered about corn. In former days everyone used song and prayer when they planted. In prayers the White Mountain asked "a girl that smile all the time" (a certain kind of "popped-open" corn) to bring them a good crop. They also asked the mythical "Corn People" of each locality (each large agricultural site, such as Cedar creek, Canyon Day, East Fork, and as far afield as Cibecue) to
assist in insuring a bountiful harvest.
At East Fork planting was begun in the eastern section of the field and was accompanied by the following prayer: "I'm going to plant corn today. Dark (holy) gan's (spirits) farm, all the crop he's got around his farm, I want a crop just like his. Our Blessed Mother God, Jesus." At the present time the person goes around the field four times repeating this prayer. There were also accompanying songs, but the informant refused to translate them. The reason given was that anyone who sang these in summer or spring, except in the field, would be struck by lightning or bitten by a snake.

Formerly the cibecue removed their moccasins while planting. If they failed to do this it was believed that the corn would produce many leaves but no ears. Now, when plowing, some remove their shoes for the same reason. This practice was denied by the white lountain.

Corn: Care. The White Mountain occasionally broke the crusted earth to aid the growth of corn or pumpkin shoots. This practice was denied by the Cibecue.

Fences to break the wind or individual shields
to protect plants from driven sand were never used by the Apache. Such protection was unnecessary.

White Mountain fields were occasionally damaged by flood. In these instances no one entered the field for four days. On the fifth day, if the corn were not completely washed out or buried in debris, the roots were re-covered. Bent stalks were straightened and tied to sticks, two to the stalk. After the corn became firmly rooted the sticks were removed. Corn was not hilled.

At Canyon Creek corn was weeded when about six inches high, at which time the earth was loosened around the stalks with a digging stick. If necessary it was weeded a second time, but not cultivated. At Cedar Creek weeds were pulled when the corn was twelve to eighteen inches high. At East Fork the corn was weeded only once, when about eighteen inches high. At this time the earth around the plants was loosened. Formerly weeds were pulled or gouged out and thrown clear of the field. They might be burned after they had dried. Now they are left where chopped or pulled.
Formerly the Cibecue thinned their corn and
threw the excess stalks away. Only the largest stalks were left. This was said to "make better comn." At Cherry Creek every stalk over ten to a clump was re-
moved. Now very few do this. One man said he preferred to use the excess corn for fodder. The white Mountain also thinned their corn.

Fomerly irrigating was done early in the morning or late in the evening; occasionally, by moonlight. Irrigation during the heat of the day was thought bad for the crop. Both men and women irrigated, though this was considered primarily a woman's task.

The Gibecue first watered corn when it had reached a height of six or eight inches. Following this it was irrigated whenever necessary, "maybe two or three weeks apart."

The White Mountain irrigated from two to four times: first in May when the plants were about eighteen inches high, again a month later, and perhaps again in August. Rain ceremonies were often held in July when the corn reached a height of two and a half or three feet. These were directed by medicine men who led the prayers. The cost of the ceremonies was apportioned among the participants. When the crop had been watered two or three times or a good rain had fallen and the success of the crop was assured, farmers often left the farms for one to three months to gather wild foods.

Song and prayer accompanied irrigation and cultivation. The Cibecue addressed the corn, saying: "Grow
fast; don't bother it, worms; make a good crop." No other ritual was practiced until the tassels formed. Then a woman possessing ceremonial knowledge walked around the field singing, "Make a good ear; don't hail." If presented a gift, such a woman would sing for others. Some farms seen in 1947 viere suffering from lack of water which was readily available. Some fields were choked with weeds taller than the corn. It was said that people would "rather ride around or go some place and drink" than care for their fields. When vieving such fields the author was usually told how much better they were tended in former days, or how much harder they had worked. Other fields were seen which showed every evidence of excellent care.

Corn: Harvesting. Late August and September were the normal harvest periods for $2 l l$ crops, though harvesting misht be delayed or continued into October or even November. If not already at the farms, families and local groups returned for this purpose. At times only the mature ears of corn were harvested and the remainder collected as they ripened. At other times all were harvested and green ears, if present, pit baked and dried. Harvests might be hurried in order that a group could leave to gather or hunt. Among most local
groups the majority of the families spent the winter in lover country.

White Mountain harvest time varied with the type of corn and the time of planting. Barly "Hopi" corn was said to mature in sixty-five days. A short, yellow corn, growing about four feet tall, was harvested in eighty-five days. White, soft Indian corn could be harvested ninety-five days after planting. Blue corn was the slowest to mature, often being harvested in November. The fast-growing sixty-five day corn was often planted late, perhaps in July.

There was no fast rule for the time of harvesting, nor was any priority given one crop over another. Beans and pumpkins were harvested at the same time as corn.

The Apache determined when corn was mature by examining the silk. If dry, they opened a part of the ear and looked at the grains. If the kernels were still soft they closed the ear; if not, it was removed from the stalk. Or they might wait until the husk and silk were dry. A chief would probably suggest at a morning talk that it was time to harvest, or urge that the crops be gathered so that the group could go south to collect wild foodstuffs. Heads of families then instructed their group to harvest.

There was usually no cooperative exchange of labor at harvest; only the immediate family worked. However, non-farming helpers might be notified or volunteer. These helpers were either friends or relatives, women more often than men.

The first act in harvesting was to select the ceremonial stalks and choose the four "female" ears, as described in the section on Seed Selection. Then the ears were picked and thrown into a burden basket on the back. Ears were usually removed from the standing stalk, but one harvest in the 1880's was described in which all the stalks were pulled and taken to the side of the field before the ears were removed. Sometimes the stalks were trampled as the ears were picked in order that none would be overlooked. Bourke ${ }^{70}$ noted stalks still standing in a harvested field.

The piled corn was usually husked in place, leaving enough to tie the ears together into bundles of eight to twelve. Bundles so tied or braided together were carried by hand. They also might be transported in burden baskets or saddle bags, in which case it was unnecessary to tie them or even husk them. If men and

[^16]women were involved, the men usually carried hand bundles, the women baskets, though white Mountain men basket packed with chest and shoulder or head tumpline. Corn husks, stalks, and cobs were frequently burned in a field after harvest.

Corn was dried from two to four weeks. Bundles of ten or twelve ears were hung over a tree limb or an improvised drying rack. Drying on a ramada top (in which case the corn is turned) was also common and is the prevalent practice today. One informant stated that ramadas have only been in use for the last seventy or eighty years.

When the corn was thoroughly dried, part or all of it was shelled. Requisite dryness was determined by the shrinkage of the kernels and the ease with which they could be detached from the cob. If the crop was small kernels were removed by hand. If large flails were employed. The corn was placed on a hide or blanket, covered with a hide, then beaten with a flail six to eight feet in length. Any grains left on the cob would be removed by hand. After beating, the corn was winnowed either by tossing it in a basket or by placing a basketful on the head, and letting the com dribble out. Women did the winnowing.

When shelled by hand the butt of a cob was used
to gouge out one or two rows on each side of the ear. The striking cob was held in the fist and jabbed against the kernels with a downward motion toward the operator. Then the ear was held in the left hand (for a righthanded person) and the right hand twisted over the ear with an outward and downward movement; the heel of the hand detached the kernels. If a few rows had already been removed, the remainder might be removed by twisting the ear in the hands. Gifford ${ }^{7 l}$ records the use of stone, bone, antler, and stick awls in shelling, but informants stated such tools were never used, only the blunt end of a cob.

It was a breach of good behavior for anyone not of the family to enter a field from the time the crops began to sprout until after harvest. Ihis custom resulted from the fear that jealous individuals might ruin the crop by sorcery.
"Ditch bosses" or men with agricultural rites were frequently called on to perform a ceremony to hasten the ripening of the crops, according to Goodwin. 72

[^17]Goodwin ${ }^{73}$ records and annotates a myth in which Turkey directed the harvest procedure. Four ears, the largest and finest, were placed on the ground, butts to center and pointing in the cardinal directions, with the other ears piled on top of these. These four ears stood for all the corn, that it all might be as perfect as they were. After all the corn on the pile was tied in bundles the four bottom ears were tied together by the husks. At the beginning of the husking, the first ear was thrown into the air, the man saying, "Let our pile of corn be so high."

Corn: Storage. At least half the corn crop was stored. The remainder was consumed as needed or transported to the winter camp. An attempt was made to store enough to last until the next harvest.

Often there were many caches belonging to each family distributed so that they would have available food supplies in several areas if surprised by enemies. A family might have as many as five or ten caches, but not all for corn. These were located near the winter camps and farms. Crops of different years were stored in separate caches.

73 Goodwin, Myths and Tales, p. 71.




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Corn was stored with the husks on or off. Often bundles of twelve ears or so were tied around with yucca cord, or eight, ten, or twelve ears might be braided together by their husks. If two or three pitched water baskets or more were available for storage, the corn was shelled and placed in there.

Corn of different colors was almost always stored separately, though there were exceptions. Seed and food corn were stored in separate bundles or vessels. Partitions inside the storage pit were made from bear grass and cedar bark (Juniperus sp.). Different colors of corn might also be used to designate parts of the pit. Sometimes relatives (apparently members of an extended family or close group) used the same cache with such partitioning.
"Rich" people stored in pitched baskets, baskets, or pottery vessels. "Poor" people wrapped their corn in bear grass. Corn placed in grass spoiled if it became damp. The "rich" used as many as ten or twelve containers, sealing them with grass, stones, and mud; or a stone cut to fit the opening, cemented with mud.

Seed corn was usually stored on the cob at the bottom of the cache. Other corn was stored either on the cob or shelled. If corn were stored on the cob it was wrapped carefully in bear grass, though it might be
put in a buckskin bag (this was a large bag shaped like a gunnysack, with the opening at the center across the short side). Shelled corn, both for seed and food, was stored in an old pitched water basket (a new basket was never used for such purpose) or pottery jar. For cave or rock-shelter storage, olla-shaped baskets were often used.

Major Bourke and Barnes ${ }^{74}$ in 1883 found in a cave up East Fork a cache of corn, devoured by weevils, stored in thirty finely executed and decorated baskets ranging from one to five feet high. They were told that this had been placed there years before at the death of a beloved member of the tribe. It was not possible to obtain confirmation that such storage for the dead had ever been an Apache custom. Informants denied the practice.

Cave storage or storage holes in the rock below ledges or bluffs was also practiced. When the storage was of this type, stones were piled outside the openings or they were valled up.

Ground caches were located in sunny spots by the White Mountain, on a slope by the Cibecue, to keep them

[^18]dry. The Cibecue preferred sandy soil, often near or under a juniper tree. Cibecue caches were usually shallow and conical shaped. Bear grass or gramma grass (Bouteloua Sp.) was laid on the bottom. Wrapped bundles or vessels were placed on this, then covered with a layer of bear grass. Over this rocks of eighteen to twenty-four inch diameter were placed, then a layer of juniper brush and twigs. A covering of earth completed the cache. White Mountain caches were as deep as six feet, sloped conically down to a round base, and were just large enough at the top for a person to enter. A fire was built in the bottom to dry them. Bear grass and juniper bark were used for flooring and compartment divisions and the whole covered at the top with grass, rocks, and earth. No pole siding or roofing was used.

People prayed as they cached food or other objects. One prayer reported by a man who heard it in the 1880 's was as follows: "I bury my corn here; don't nobody bother; don't coyote or bear or anybody dig it out; if you see him you change his mind."

Men dug the storage pits, while vomen stored the food. 75 Adolescent girls watched while caches were

75 Goodwin, Western Apache, p. 333.
constructed and helped carry food to them. After marriage youths were taught the art of storage by their parents. 76

Stored corn might be inspected to see if it were dry and undisturbed. Formerly the Apache took great care in storing corn because it was a scarce commodity. Pit-baked corn and parched corn were not ground-cached.

The White Mountain stated that they never stored corn or nuts in tree caches. A Cherry Creek man described the tree-caching of corn. Tventy to forty ears were assembled in a bundle some two feet in diameter and wrapped with bear grass. Hung from a tree, it would keep for about a year. Another method of preparing corn for storage was to impale an ear on each end of a sharpened stick. Approximately forty of these were then tied in a bundle. They weighed about seventy to eighty pounds and could be suspended from a tree or transported with ease.

Cellar dugout granaries were used after the military occupation and are still to be found. They were of varying size, averaging perhaps four or five feet in width by eight to ten feet in length. Their depth was

[^19]about eighteen inches. Over this pit was placed a gable roof. Ihis was covered with bundles of bear grass, then earth. Earlier the entrance was walled with rocks. Later wooden doors, which could be locked, were used.

At present storage is in baskets, pitched water baskets, cans, sacks, boxes, and bins. One house which was examined had two ladder-like bundles of long-eared corn hung against the wall, and a can and a box filled with the same product. In addition there was a large box or bin inside a shed, and two large outside bins were against another shed. Another house had a box of corn on the back porch, and in the wickiup owned by the same family, several baskets and cans containing corn plus a large pile on the floor.

Corn: General, Names and Varieties. The White Mountain term for corn (Zea mays) is nata (pronounced na-tah with a heavily accented and clipped-off last syllable). The Cibecue word is natan (pronounced as in French). Color and other descriptive adjectives are appended. Variety names, which follow, were descriptive in terms of color: blue corn; soft gray-blue corn; striped red and white or yellow; almost red with white stripe; white; pink; yellow; red (almost black); black.

One particularly large-butted, long, curving type of corn ear was called. "gan corn" or "bear corn" by the Cibecue and was used in curing. In one of the White Mountain myths, Turkey shook out "big corn," which Goodwin ${ }^{77}$ identified as dark red corn.

Blue corn was said by the White Mountain to be the male and boss of all the corn. There was a "flatheaded, small, female" corn, not a variety, which was sought as a part of the necessary seed. A kind of "popped-open" corn was called "a girl that smiles all the time" and was used in prayers to the Corn People; this also was apparently not a variety.

The Cibecue "Corn Chiefs" or "Corn Captains" (these were medicine men, but nothing more was learned of them -- possibly they were "ditch bosses") had names and synonyms and associations for some of the varieties of corn. Black corn was also "sun-up" corn or "man's" corn and was associated with the east. White corn was also called "girl's" corn and was associated with the south. Yellow corn, associated with the west, was "sundown" corn or "woman's" corn. Blue corn was "boy's" corn and was associated with the north. Goodwin stated that the "seven varieties" of

White Mountain corn were each the property of a certain clan or clans, but that corn was definitely not assigned to one clan only and that there was nothing comparable to Pueblo corn clans. Clans owning a certain colored corn were not restricted to the planting of that particular kind, but permission to save the seed of another kind was asked of the owning clan as a matter of form. 78 The following list of corn-owning white Mountain clans is from Goodwin; ${ }^{79}$ no information on this subject was obtained to add to that of Goodwin. The iyar "? afc ye clan ( 'Jyà"ái people) and the tsét'éán clan (rock jutting into the water people) owned white corn. The t'uagàidn or $t^{r} u ́$ hàgaìyé clan (white water people) owned yellow corn. Gray corn was owned by the t'údixxìxí clan (black water people). The bìszáhé clan (bìszáhé people) and the nádotts'ush or nádo. hod. 'ts' usn clan (slender peak standing up people) owned black corn. The náyòdèsgìjn or náwàdèsgìjn clan (between two hills people) owned "round corn" and blue corn. The t"ìslè.dht'i.dn or t'I.słè. dit' i.hé clan (cottonwoods joining people) was an additional clan owning blue corn.

The Cibecue group claimed to have had, before

78 Goodwin, Western Apache, p. 116.
79 Ibid, pp. 600-613.

Reservation days, corn in blue, white, yellow, red, black, green, and speckled red with a light stripe varieties. These were not preserved in a pure form, as they cross pollinated after a few years.

The White Mountain stated that blue, red, soft white, hard white, yellow, and black were the most ancient types. Barnes, 80 who was stationed at Frort Apache in 1880, speaks of "Indian corn in the common red, green, blue, and yellow colors." The author collected in the East Fork, Canyon Day, and Cedar Creek areas long ears of red, white, yellow, speckled blue and white, speckled red and white, and black comn.

Corn height was shorter than modern American corn, varying from four to six feet and not usually over five. The number of ears varied from two to four to the stalk, with two being the expectable number. The pre-American corns were said to be faster growing than modern American. A soft white early corn was said to be harvested in sixty-five days. 81 A red corn with a light stripe which was called "Hopi" corn was reputed to grow in sixty-five days. A short yellow corn growing about four feet high was reported to mature in

80 Barnes, Apaches, p. 114.
81 It is doubtful that corn matures fully in this length of time. (Castetter and Bell, Pima and Papago, pp. 79-80; and Yuman Agriculture, ms.)
eighty-five days. Another soft white Indian corn required ninety-five days. Soft red corn was said to require a longer growing time than soft white, and blue corn required the greatest of all.

Corn: General, Origins. Apache mythology associates corn with the gan or mountain cave spirits. In one tale a gan married Raven Chief's daughter, took her to the underworld, then brought Raven presents of corn and seeds with instructions how to plant them. 82 In others 83 Turkey shook corn from his wings and taught farming.

01d Apache, however, have realistic traditions concerning agricultural origins, which derive corn from various surrounding peoples. Canyon Creel and Cibecue stated that corn was first obtained from the "Hopi friend of Apache" and "Pima enemy of Apache." The Cherry Creek had traditions of obtaining corn from the Mexicans and from non-Apache Indians to the southwest.

A White Mountain Apache, now eighty-eight, recounted the agricultural traditions he heard when a boy. He was told by his elders that they had in turn been

82 Goodwin, Myths and Tales, p. 98.
83 Ibia., pp. 51-52.
told by their elders that the original seed and practice of agriculture had come to them from the Mexicans and Pueblo (which Pueblo is unknowm, as they are 211 called in Apache "People on the Rock"). Prior to this time, the tradition went, the Apache had lived only on wild products. This account, if reliable, carries Apache agriculture back at least 200 years ago.

This man stated that white hard and yellow hard corn were first obtained from Mexico, that soft white, blue, and red were derived from the Pueblo.

Several Apache spoke of occasional trading expeditions during the last century to Zuni and (in the case of the Cibecue) to the Hopi in which corn was brought back. Some of them believed that flint corn was first introduced by white Americans, and none had heard of pop corn or sweet corn prior to the American occupation.

Though the Apache have had long contact with the Navajo, sometimes friendly, often not, nono mentioned com or other plants being obtained from them.

Corn: General, Attitudes and Preferences. Corn was highly valued by the Apache. If possible, they had a small amount of corn food, in one form or another, each day. People liked to farm and apparently those who farmed most were those with high social and economic
prestige, the "chiefs" and "rich people." Both men and women were interested in agriculture, but in former times the women were the most concerned and were reputedly the better farmers.

People were enjoined by chiefs in their daily morning harangues to plant corn, to take care of it, to work hard, to feed their wives and children. Young people were given similar advice by fathers, mothers, and grandparents.

The girls' puberty ceremony used to include the grinding and cooking of corn as part of the girl's tasks to show her abilities. At Cedar Creek in 1948 a dying girl dozed or lapsed into periods of unconsciousness shortly before her death and told those around her, "We'll plant corn; it's a beautiful place" (the field she had seen), then died.

Though they value corn, the modern Apache do not show the concern over it that some of the Pueblo are reputed to have. One young woman took the author across a field to show her farm. A ditch had broken and water was flooding some six to ten rows of corn and would obviously wash it all out. She showed no concern and made no attempt to divert the water into its channel. Horses were seen tethered at the edges of growing corn, where they were allowed to feed on it. The Apache said
"they do not feel bad, as do the Hopi, over accidentalIy injuring or cutting down any of their plants."

The Apache hold colored corn in high regard. They prefer flour corn over flint. Some said they would rather have Indian corn than "American" or "tall Kansas" corn because it is softer.

In their preferences for seed corn they varied, some keeping and planting only one color, most preferring to plant more than one color. Most preferred blue, a few yellow, white, or red. Black was rarely planted because it was difficult to know when black corn was properly cooked, burned, or not yet done.

Blue corn meal was cohesive and made the best tortillas; other kinds "cracked easy." White corn meal was also desirable for tortillas, "but the rest, no." Yellow or white corn was most desired if consumed in the green stage; "red not taste good, blue hurt the heart." Yellow corn was favored for parching; white and red next. White corn meal was best for mush; blue and others were not much used. Yellow flint corn was best pit-baked; used otherwise, it was too hard.

Corn: General, Uses (Other than Foods). The Apache used the small corn stalks, which they had removed while thinning, for beds, though twenty-four inch
"hay" grass was preferred for this purpose. Bedding material was piled on the ground to a height of four or five inches. Now these stalks are used for fodder. Corn husks were never used for dye. In modern times corn husks are occasionally used to stuff mattresses, but "make too much noise." Wide husks were used for wrapping corn bread or tamales, small ones for cigarettes.

Cobs vere used at one time to make pipe bowls. They were also burned to produce coals for parching corn and were considered the best fuel for this purpose. Now they are often piled up for use in stoves. Husks, cobs, and stalks were often burned after harvest, there being no tabu against this practice.

Corn smut was rubbed on the face by girls to bleach the skin.

Big, large-butted, curved ears of corn called "gan corn" or "bear corn" were sometimes used by medicine men in curing. Only one ear of this was used. It was heated in the fire, applied to a patient's head, reheated, then re-applied several times. It was not learned what ailment this cure relieves.

For use in connection with ritual pollen was shaken from the corn into a deerskin bag by the cibecue. If necessary it was mixed with the preferred cattail
pollen to increase the bulk. Goodwin ${ }^{84}$ states that yellow cornmeal may be mixed with pollen or used in its place. Curtis 85 states pollen is mixed with meal and offered during prayers invoking an abundance of corn. The author's White Mountain informants stated corn pollen is never used and that cattail pollen may be mixed only with that of the pinon.

Corn: Recipes. Much corn was eaten before it matured, partly because green corn recipes were liked, often because the previous harvest had been exhausted. Immature corn was sometimes boiled, cob and all, at the time the ears came into silk. Usually only the smaller of the two ears on a stalk, the lower one, was plucked before maturing. The cooked cob was said to be good. Yellow or white corn was the preferred corn for such use.

Green corn on the cob was boiled or roasted. This is confirmed by Reagan. 86 Iarge green com was ground and made into gruel. 87 Green corn was mashed,

[^20]salted, and compressed into a cake which was baked in ashes. 88 Reagan 89 describes a "wedding cake" and puberty ceremony "cake" which the author's informants denied was made. It was prepared, according to Reagan, of mashed green corn or from finely ground corn meal. A yeast prepararation for "sweetening" the meal was made from the chewed root of Euphorbia serphyllifolia, which was preserved in sacks in dried form. A piece of the root was chewed and kept in the mouth "for a couple of days," a virgin usually doing the chewing. The meal was then cheved with the masticated root or in the "freshened mouth" without it, and the cud deposited in a vessel. At the time Reagan made his observations (probably about 1901) sprouted corn and partly sprouted wheat was used to produce the "sweetening."

Reagan ${ }^{90}$ saw walnut kernels mixed with mashed green corn and baked in cake form.

After the Apache learned to fry foods, green corn was sometimes cut off the cob and fried with deer fat and young pumpkin.

The process of pit-baking green corn, as

88 Reagan, Plants, p. 148.
89 Loc. cit.
90 Reagan, Notes, p. 295.
described by a Cibecue man, was as follows. A pit four feet square and two feet deep was filled with crisscrossed wood, over which round rocks four to $s$ ix inches in diameter were placed. Oak was used for fire wood, as pine killed the flavor. The pit was fired. After the smoke had abated, any wood still smouldering was removed. Green corn stalks were laid on the hot stones. Then the corn, either husked, unhusked and in single ears or tied in bundles, was thrown in. About 100 pounds, four or five burden baskets full, were used. Corn stalks were placed over the corn and covered with earth about one foot in depth. Meanwhile a stick had been held vertically in the pit. This was removed and through the opening which remained about five gallons (two large pitched water baskets full) of water were poured into the pit. The hole was then closed with earth. This operation was performed just before dark. Next morning the com was removed and cooled. It might be eaten immediately or shelled with a knife, dried three days in the sun, and stored. If stored it would keep all winter, but not past spring. It was boiled for use às needed.

A White Mountain corn pit, still used, measured seven feet square and four feet deep. The stones used in the pit were rounded and of from six to eight inches
diameter. Most were vesicular lava, though there were some of limestone. In this pit four wagon loads of green corn were dumped at a time, and about fifteen gallons of water poured in for steaming.

None who had been struck by lightning might participate in the steam-baking of corn; it was believed the grain would not cook under those conditions. There was a tabu on sexual relations among the participants during the time of cooking. A "lucky" person (one with power) was obtained to light the fire. This was lighted first on the east, then the south, west, and north. It was believed that a family must continue to use the same pit if they were to get satisfactory results. They could not go from one pit to another as with mescal. Reagan ${ }^{91}$ states that green corn was steamed for twenty-four hours before being removed from the pit. Palmer, 92 who does not mention the use of water in the pit-baking of corn, states that the process required from eighteen to twenty-four hours.

Reagan ${ }^{93}$ states that at harvest time all green corn was separated and pit-baked.

91 Ibid., pp. 292-93.
92 Palmer, Customs, p. 168.
93 Reagan, Loc. cit.

Corn was often husked and spitted on the end of a sharp stick and roasted by hunters. Burned kernels were removed with a stick before eating. An unhusked ear was sometimes placed directly in the fire or in hot ashes and roasted, then husked and eaten. Corn was eaten even when scorched by the fire.

A pile of corn might be roasted by covering it with brush and firing it. However, according to the White Mountain, it had to be carefully placed with the ears in an upright position, stems to ground. One husk had to be removed from each ear. Even children were said to know these requirements. Pailure to observe them was believed to bring bad luck.

Corn was often parched before grinding. It was never stored in this state, but was ground and used immediately. Ground corn, parched and unparched, was eaten by the pinch, mixed with other ground seeds and eaten by the pinch, and cooked, alone or in combination with other foods, into a "gravy" (mush or gruel).

Cornmeal dough was compressed and small dumplings, as large in diameter as a finger, dropped into a boiling pot of plain water or soup. Such dough was mixed only with salt and water. It was necessary to prepare two dumplings at a time, one in each hand; contrary practice was believed to bring bad luck. These
dumplings were termed ee-cheek-izeh'. They were placed in a basket, speared with a sharp stick, and eaten. Small dumplings were also cooked with ground acorn meats.

Bread was made in a variety of ways. An "ash bread" was prepared from cornmeal mixed with salt and water. This was placed on an ash bed, covered with ashes, and small coals raked over the top. After a period of time it was uncovered and, if not completely cooked, turned over and recovered with ashes and coals. When done it was placed in a basket and water poured over it to remove the ashes. It was then broken with the hands and eaten. "Ash bread" might also be wrapped in corn husks before cooking. In this shape it resembled a tamale.

At Oak Creek in the early $1890^{\prime}$ s a man who had been in the Hopi country made an earth oven in which he baked com tamales and bread. This oven was said to make excellent bread, but was not durable and had to be rebuilt after about four days. This was the only instance known by informants of the use of a Pueblo-type oven.

Tortillas were prepared by spreading a cornmeal batter on a hot stone. By the 1890 's, at least, a small amount of government-issued white flour was mixed with
the cornmeal to make the tortillas less crumbly. Blue corn was favored for tortillas. White corn was also desirable. Today tortillas are generally made of white flour. They are cooked on a wire grill. Goodwin ${ }^{94}$ quotes one of his informants on the process of tortilla making as follows: "Take a metal hoe, set it on three stones in the fire and be sure you have hot coals in between the stones. Now mix up your corn-meal dough, roll it into a ball between your hands, then mash it down on the hot hoe blade. When you have mashed it so it reaches the edge, take it off."" Burke 95 states the scouts made tortillas in a metal pan, Santee 96 that hunters carried a flat piece of tin for this purpose. Reagan ${ }^{97}$ states that the Apache made a "corn pone" baked in or under the ashes or cooked in lard in a skillet, and a kind of saltless cornmeal "pancake" in a skillet. He describes tortillas as made of flour and baking powder, if available, on an inverted skillet.

Mush was prepared from cornmeal alone, but

[^21]usually meat or other plant foods were added. Mush was made from cornmeal, to which might be added meal from ground parched beans, sunflower seeds, saguaro seeds, and other wild seeds. The cornmeal might be ground from parched or unparched corn. The mush was normally eaten with the fingers from a basket. Juniper ashes were used to flavor cornmeal mush and to produce a green color. Gruels were prepared from cornmeal boiled in soup and from parched cornmeal boiled with mashed pumpkin.

Corn was used in many combinations with other foods. The whole grains of green corn which had been steam baked were boiled with meat or with plant foods. It was boiled with beans or with beans and venison together.

A flour which was eaten by the pinch, either dry or slightly moistened, was prepared from parched cornmeal mixed with ground sunflower seeds, acorns, walnuts, pinon nuts, or lightly parched pumpkin seeds. Such flour and flour prepared from corn and miscellaneous wild seeds was also baked into bread cakes.

Cornmeal was cooked as a "sausage" in the intestines of animals in the same manner as was blood.

Corn cobs were mashed and boiled in water with salt. For some this was a starvation recipe, others
prepared it because they liked it.
Corn smut (Ustilago maydis) was often eaten in the field uncooked. At other times the smutty ear was taken home and boiled. The smut was on other occasions removed from the ear, wrapped in corn husks, and boiled until solid, after which a stick was pushed into it. Finally acorn meal was sprinkled over it and it was eaten.

Corn and "hominy" were mentioned as being boiled with broken or dried bones. The use of true hominy is either a late practice or the term was misused by the informant, as the Apache did not formerly prepare hominy.

Beans. There is some doubt concerning the antiquity of beans (Phaseolus sp.) as an Apache crop plant, though they were known to be cultivated prior to the Anglo-American occupation. A Spanish document dated 1799 and translated in part by Whipple 98 stated that "The Coyotero Indians raise small quantities of maize, beans, and a few legumens."

The Cherry Creek people believed they had had beans long before the advent of the military. According

98 Whipple, Report on the Indian Tribes, p. 120.
to tradition, they had obtained beans (teparies; Phaseolus acutifolius?) from the Pime ("got lots of things from them ${ }^{\text {II }}$ ) and from the Mexicans. However, beans were not, as were pumpkins and giant sunflower seeds, attributed to the "cave people" (gan). The White Mountain did not plant many beans; some of the local groups or families did not plant them at all; and some denied that they had ever grown them before arrival of the soldiers. They stated they did not have prayers or "lucky" planters for the beans as they did for corn and pumpkins because beans "came from the whites." At upper Canyon Creek people began using beans introduced by the Americans after 1890. Prior to this they had a big white bean "like the lima bean" (Phaseolus lunatis? or Phaseolus coccineus?) and small varieties of kidney beans (Phaseolus valgaris) in white, yellow, red, and black colors. There was also a small black-eyed bean (cowpea, Vigna sinensis?) which did not grow downward as other varieties, "just stick it out." Only pink kidney beans and pinto beans, both introduced in modern times, are now grown in the Cibecue area. The White Mountain had red, yellow, blue, and speckled beans, the antiquity and antecedents of which were undetermined. A yellow bean is still grown at Cedar Creek and a cream colored bean speckled with brown
(a pinto bean) is grown at Canyon Day. The pink and pinto are the favored types, and the pinto, reputedly, was obtained from the Mexicans.

The presence of black-eyed peas (Vigna sinensis) was denied by all.

The qualities of the various beans were believed, by the cibecue, to vary. All were planted at the same time, harvested at the same time, and irrigated in the same manner. The present beans come up in about a week and a half, but the sprouting time of the old types was unknown because they were planted and unattended until they were well grown. All stored equalIy well. Insects were said to bother the modern pink beans more than the old type beans and to have molested the large white bean (Phaseolus lunatis or Phaseolus coccineus?) hardly at all. (Possibly this is just an impression. Insects were said not to be numerous or very troublesome fifty years ago. Now the Mexican beetle makes dusting necessary.) Pink "English" beans and the old Apache small white and large white beans were said to produce about fifty pounds to the patch, While the yellow and red beans yielded about 100 pounds to the same patch (the size of this patch was not satisfactorily determined).

The modern "English" beans are well liked. They
never cared much for the old Apache large white bean (Phaseolus lunatis or Phaseolus coccineus?).

Formerly beans were planted in the early spring at the same time as corn. A variation of this occurced at upper Canyon Creek, where they were planted about two weeks after the corn "so they would get ripe the same time." In either case they matured at the same time as the corn and were harvested with it. In the last forty years, probably under government tutelage, beans have not been planted until July. In 1947 some were planted August lst at Cibecue.

Formerly and at present some planted beans in separate plots, some between the corn clumps or with the corn and pumpkins. At Oak Creek one woman planted separate patches, rows one foot apart and hills one foot apart. Six or seven seeds (the same as today) were dropped in a four to five inch hole made with a planting stick. Others separated rows and hills by two feet or more.

Bean fields were always irrigated before planting. The usual practice was to water again when the plants were six or eight inches high, when they flowered, and when the pods formed. Irrigations subsequent to these were determined by need. Weeds were pulled and the earth around the plants stirred with a
stick when the vines were small.
Beans were not soaked before planting except by the East Fork White Mountain; these people soaked them the same as corn. At cibecue it was said they cracked too easily to withstand the soaking. However, they are now moistened in a gunnysack of wet earth.

Large and small beans were always planted in separate rows. Different colors were usually stored and planted separately.

Some preferred a sandy soil in which to plant beans. The older generation of Apache said that beans grew better in a high altitude and cold climate.

There was no ritual or prayer in the planting and care of beans as with corn and pumpkins. However, the prayers for the corn served for beans and all other crops. Beyond some weeding and cultivation with a digging stick, little attention was given the bean crop. Beans were not trained on sticks or poles, though now some support them with wire or string trellises "learned at school."

Oak ashes were sometimes sprinkled on beans, as on other crops, to prevent attacks by insects. Insects might be removed with the hands and crushed. A red insect with black spots was so crushed and also the nests which it made beneath the leaves.

Green kidney beans were sometimes picked and boiled with salt, but they were usually not harvested until September or October, when they were ripe and hard. The whole bush was pulled, placed on a hide or blanket (occasionally some Apache pulled only the pods instead of the whole vine), and beaten with a flail. The larger leaves and stems were then removed by hand, and the beans winnowed by tossing in the air with the hands, or pouring from a basket held on the head. Beans were sometimes trampled instead of beaten at Cibecue. This practice was denied by the White Mountain. The large white beans (Phaseolus lunatis? or Phaseolus coccineus?) were never beaten, but shelled by hand.

A six foot flail was used, usually operatod from a sitting position. If necessary, beans might be beaten twice. The harvesting floor was about ten feet in diameter, the surface hardened by wetting and trampling. If the pods did not open they were pulled off by hand and might be taken home to cook.

A few beans were given to helpers.
Formerly beans were placed in pitched water baskets, buckskin sacks (twenty-five pounds or so), or pottery vessels, and stored in ground caches or rock shelters. Formerly the crop was small, "not over fifty pounds." Seed was selected on the basis of color
rather than size, but was inspected to make sure it was sound. Today some beans are stored in the pod. Bean crops were said to be better forty years ago, but are now considered uncertain and poor. Dust for the Mexican beetle is distributed without charge to those who wish it, but not all take advantage of this. The Whiteriver Farmer has tried to increase the planting of beans on unirrigated farms.

Mush was made from ground parched beans. Whole beans, unparched, were boiled with salt. During the summer only enough for a single meal were cooked to prevent spoilage. Beans were also boiled with corn. Only in recent times have the Apache fried pre-cooked beans.

Pumpkins. Pumpkins (Cucurbita moschata or Cucurbita Pepo) were one of the earliest Apache plants. As with corn, there were special songs, prayers, and "lucky" planters for them. Only one informant failed to include pumpkins as one of the original Apache crops.

Although an old crop, pumpkins do no appear to have been grown in great abundance in pre-American times. Families which planted corn every year did not always plant pumpkins. At upper Canyon Creek families used to raise from five to ten large pumpkins. At

Cibecue in earlier days they raised "not too many, just five or six is all;" now at Cibecue they may raise as many as a hundred, but many are not used -- "horse, burro eat it." At Cherry Creek there were possibly so mewhat more, for up to twenty were sometimes stored temporarily in layers of grass. At Cedar Creek only a few were grown, "just three or four or six," and the same was true of the other White wountain. In 1883 100,000 pumpkins were raised on the Fort Apache Reservation. 99

At Cedar Creek it was said that formerly only one variety, a large yellow pumpkin, existed. At East Fork there was a round, not too large, hard-shelled, greenish colored pumpkin, and a "crooked-necked squash" (Cucurbita maxima?). The latter was derived from Mexico.

One type raised at Canyon Creek was large, sometimes fifteen to twenty inches in diameter, long and soft necked, with a blue stripe. Other types were small, about ten inches in diameter, without a neck, hard-shelled, and were black, white, or brown striped. There was no orange colored pumpkin. At San Carlos there were said to be yellow, gray, and other colors

[^22]of pumpkins.
The Cibecue now raise a large, hook-necked pumpkin, and a yellow pie pumpkin. A round black and green striped pumpkin "just like a cloud" matured earliest. It had a yellow interior. According to informants it spoiled easily. The "hubbard squash" (Cucurbita maxima?) with long neck and green or gray color was the latest to mature; it stored better than most varieties and was used throughout the winter. A white, hard, short-necked pumpkin was midway between these in growing speed and storing qualities.

Pumpkins were planted five feet (two paces) or more apart, not in any pattern but randomly. Some planted them in the corn rovis, some around the edges of the corn field, some in separate plots. They were planted in moist ground with a digging stick, in a hole four to seven inches deep. Four or five seeds were dropped in each hole. The seed was sometimes soaked for about an hour before planting among the Cibecue, all night by the White Mountain. Seeds were not dampened or sprouted in wet earth. All varieties were planted at the same time and at the time the corn was planted. They were not planted with or close to watermelons. The plants appeared above the ground in about one week.

Pumpkins were weeded, irrigated, and the ground around them sometimes stirred with a digging stick at the same time as corn. Those in separate patches were irrigated when about eight inches high, when the vine began to spread out, when they bloomed, and thereafter until ripe. Water was poured at the roots to make them grow large. Oakwood ashes were sometimes sprinkled on them to repulse insects. Flat "stink bugs" were removed by hand. The Apache learned from the whites to break off the ends of pumpkin vines to increase production, but only one man at Cibecue was said to do this. The Cibecue moved or rolled pumpkins to dry areas in the patch to keep them from getting wet and rotting; the White vountain put grass under them.

Pumpkins were harvested the same time as the com or later. They ripened from early fall until November. They were pulled from the vine and no part of the vine was left attached as in the case of watermelons. Ripeness of the pumpkins was detected by the exterior losing its shine and becoming rough and by the leaves drying and falling. Some could tell when pumpkins were ripe by the color. They were not thumped to detect maturity. An attempt vas made to harvest all pumpkins before the frost, as this would ruin them.

Green pumpkins were picked during the summer and
boiled or baked in ashes. When the rind of pumpkin shone brightly it was considered edible.

At harvest time they were transported to camp in burden baskets, perhaps one large pumpkin to a basket. Helpers, if any, were given some for their assistance in carrying.

Pumpkins were never stored, though sometimes kept under a pile of grass for a limited period. Grass was spread and pumpkins placed on this, then more grass, then another layer of pumpkins, etc. Usually they were eaten as harvested, or saved only a month or two. All were consumed by December at the latest. Those which a family did not need were given to others. "They had to eat them up." Nieat and hides might be given in exchange for pumpkins.

The largest seeds of the largest pumpkins were saved for seed. Color vas no criteria for selection. Seeds were stored in a small pitched water basket and placed in a ground cache. Pumpkin seeds and those of the "crooked necked squash" were always stored separately. Since the period of seasonal migrations ceased, pumpkin seeds have been stored in the wickiup. They are wrapped in grass with ashes and tied to the roof of the wickiup with three yucca strings. This was to keep them warm and dry. Seeds to be eaten were kept in a
vessel.
Since the $1890^{\prime}$ s at Cibecue pumpkins have been dried before storing. First they were sliced transversely, producing rings about three-eighths of an inch thick. They were strung on a yucca string about one to one and a half inches apart, or on sticks. They were then hung between two trees for four or five days, after which they were stored in a sack. The pumpkin was seeded and cleaned through a hole in the end before being cut into spiral strips.

Another method of drying and storing pumpkins was practiced at Cherry Creek. Segments two inches in width and one to two feet long were cut from the pumpkins. These were dried on a tree or bush. When dry they were suspended from the interior of the wickiup roof. They kept all winter, but not through the summer. They vere never ground-cached.

Agricultural rituals were associated with the growing of pumpkins as with corn, these being the only crops of which this was true. However, prayers and songs for the corn were considered sufficient to cover pumpkins.

A prayer for pumpkins was described by an old White Mountain man with the injunction that it might be written but was not to be repeated to other Indians.

It was a proprietary ritual which he wished to keep in his family. This rite was held at the time the runners were ready to spread. A young boy was sent out to pick a large supply of blue juniper berries. When he returned he was blindfolded and sent into the pumpkin patch. He threw the berries in 2.11 directions, asking for that many pumpkins. He called out "gut, gut, gut" (this is the name of one variety of juniper berry -- possibly there was another meaning), acting like a gan (mountain spirit), and asked Changing Woman for as many pumpkins on the vines as he had thrown berries. After this prayer it was said the vines "reallyं started blooming."

Newlyweds could not enter a field of growing pumpkin plants, lest the fruit shrivel and die on the vine. Other Apache stated that this applied only to nursing and pregnant women. 100 The basis of the tabu on newlyweds and pregnant or menstruating women is told in the tale of "How the Squash Plant Was Obtained."101

The White Mountain denied that pumpkins were ever used for vessels as were gourds, but a Cibecue had seen them so used in the $1880^{\prime}$ s. The meat of the pumpkin

100 Goodwin, Western Apache, p. 330. 101 Goodvin, Myths and Tales, pp. 71-76.















 rax




was scraped out with a stick and the hollowed rind boiled in a five gallon tin, then hung by a yucca string about the neck to dry. The pumpkins used were yellow-white, brown, and spotted. They were colored red with a dye from a "soft red rock." This was boiled with them in the tin. Such a pumpkin vessel would last two or three years, but was not considered as durable as a gourd.

The Cibecue used pumpkin-seed to make a cosmetic grease for chapped skin, according to Gifford. 102

A common way of preparing pumpkins was to boil them, then mash them, and stir in parched ground corn while boiling. Salt was added, but was never applied to this or to any other Apache dish until it began boiling. Sunflower seed was also cooked with pumpkin in the same manner as corn.

The halves of pumpkins or large slices were placed in an ash bed and covered with ashes. Before eating the ashes vere scraped away and the crust removed.

Whole pumpkins were opened and cleaned of their seeds and pithy matter. Either salt or some sweet material was then inserted and the pumpkin plugged,

[^23]after which it was steam baked with green corn in a pit oven.

Pumpkin seeds were eaten either uncooked or after parching. When lightly parched they were sometimes ground with corn, moistened, and eaten by the pinch.

At the present time pumpkins are sometimes cut in thin slices and fried.

Gourds. Gourds (Lagenaria siceraria) were cultivated before the advent of the Americans. Only two informants had ideas as to their origin, one stating that they were obtained from the Mexicans, the other stating that Apache captives among the Mexicans had learned how to prepare them.

Two kinds of gourds were grown: a small one about the size of two finger joints which was used as a rattle on cradleboards, and a larger one which was used for canteens, cups, and dippers.

Seeds vere sometimes soaked before planting, sometimes not. They were planted in four to six inch holes, three or more seeds to the hole (a Cherry Creek man said always four seeds). Some planted a few inside the brush fences. The vines were trained on the fence. If the gourds grew on the ground they would be flat, which was not desirable. Others placed them at
intervals around a field, perhaps four or five hills in all. Stakes vere erected and the plant trained on these "to make a long tail." One man said if gourds grew hanging on a stick they made a canteen, if on the ground they made a jug. They required more water than corn.

Seed was selected from gourds of a desirable shape, usually from a "long-handled" one, and such selection was said to produce well-shaped gourds. Seed might be stored in the roof of a wickiup, in the same manner as pumpkin seed, or they might be stored with pumpkin seed in a pitehed basket in a ground or rock cache. (Pumpkin seeds could be stored with gourd seeds, but were never stored with seeds of the "crookednecked squash.")

Yucca string was often tied around the growing gourds to shape them. Hour-glass or double hour-glass effects were so obtained. Children often played with small gourds, so shaping them as they grew. At Cibecue in 1947 some cultivated gourds with yucca string tied about the middle were seen.

Gourds used as cradleboard rattles have been replaced by beads and other gev-gaws (in one case by the celluloid-framed picture of the father, who was absent in military service), though one gourd rattle was seen
at Whiteriver in 1947. They are not used much at present for cups, dippers, canteens, and storage vessels. They were never used for face masks, or for ornaments, or for rattles other than on cradleboards.

Size and shape determined the usage; small gourds being made into cups, long handled gourds into spoons or dippers, large gourds into storage jars or canteens. They were not used to store water at home, only on long journeys, as it would taste bad, nor were they ever used as cooking vessels. They were used to store acorns, seeds, and salt.

To prepare a gourd for use it was thoroughly soaked in warm water. A row of holes were punched close together with a bone awl if it were desired to split it for a dipper. Then, by pressing, the gourd would separate, or it could be cut between the holes. It was dried in the field or hung up to dry, but never covered with brush while drying. Seeds and pithy matter were removed with a stick and water kept in them for at least two nights (being changed each day) to remove the taste. Sometimes they were boiled in a large can to remove the bitter taste. Gourds were always bored or cut before they dried and hardened. They were pulled from the vine by hand, not cut. Gourds were never baked beside a fire to harden them. Utensils
made of gourds would last for three or four years. Gourds were decorated by grinding up "red stone" in hot water and rubbing this into the gourd to color it. Yellow clay might also be used for this. These colors were not lasting. Among the cibecue this was the only form of decoration.

Among the White Mountain, designs were burnt on the exterior of gourds, probably a case of Mexican or American diffusion. Common motifs were deer, butterflies, diamonds, crosses, moons, and half-moons. The White Mountain denied painting their gourds, painting being reserved for the pitched water basket. Dorsey ${ }^{103}$ writes that huge gourds were used for water storage among the White Mountain, which use is contrary to iniormants ${ }^{\text {I }}$ statements. Gifford 104 records large gourds grown by the Southern Tonto for water bottles, too large for journeys.

One informant had been told by her great-grandmother that the Apache formerly ate small gourds. Goodwin 105 lists a clan, the nàdìlkr à sỉkà. dù ("wild gourd growing people"), named from the habit of eating

103 Dorsey, Indians of the Southwest, p. 183.
104 Gifford, Apache-Pueblo, p. 105.
105 Goodwin, Western Apache, p. 623.
wild gourds.

Melons. Watermelons (Citrullus vulgaris), as nearly as could be determined, were grown only after the establishment of the Reservation. At Canyon Creek seeds were obtained from the San Carlos whites. Bourke 106 notes that in 1883 the Indians on the White Mountain Reservation were reported to have raised 20,000 watermelons, 10,000 muskmelons, and 10,000 cantaloupes.

Seeds vere selected and stored in the same manner as pumpkin seeds. Melons might be grown in a corn patch or by themselves; now the tendency is to plant in separate plots. Different varieties of melons were often grown together, but not in the same garden with pumpkins. Hills were planted two paces or so apart, about four to five seeds to the hill, at a depth of six or seven inches. Seeds were soaked the night before planting. Planting was done at the same time as corn.

In the $1880^{\prime}$ s one man at Oak Creek put horse manure in the water in which he soaked his seed and also planted the seeds with mashed horse manure. He always planted in the evening in order that the seed

106 Bourke, On the Border, pp. 457-58.
would remain moist. This man made beds four feet wide by ten feet long. He planted four or five hills of watermelons in the side of these by pressing the seeds into the earth with his thumb. Others did not follow this practice.

Melons were weeded and cared for in the same manner as corn. Vines were not broken off to increase production, but the Apache did thin all but five or six plants. Nelons might be moved to dry ground or brush placed under them to prevent them from getting wet and rotting. When picked, about an inch of vine was left on the melon. This was believed to prevent spoilage.

Watermelons were eaten as soon as they matured. No attempt was made to dry them. Melons were never stored by burial in sand, but might be covered with weeds and kept till November.

Tobacco. Most informants stated that tobacco (Nicotiana sp.) was never cultivated by the Apache, but spoke of wild tobaccos and substitutes which were used. One White Mountain man stated that tobacco was planted in the $1860^{\prime}$ s before the advent of the Americans. This was called Mountain Tobacco because they had to go far north to get it. It was very strong, "so strong one could smell the smoke across the valley, and tasted
better and smelled better than the smoke white people use."

Goddard ${ }^{107}$ in 1910 obtained an account from an aged San Carlos man to the effect that tobacco was planted.

Wild tobaccos (of unidentified species) were obtained on the north side of East Fork and in the Oak Creek area; very probably it existed in other areas, but inquiries on this subject were not exhaustive. At Oak Creek it was said to grow best if the plots were burned over before planting. In this connection, Gifford 108 has a note reading, "Tobacco cultivated...(San Carlos, Cibecue, White Mountain) wild-tobacco seed after burning brush where it grew, not on farm. (San Carlos) tried growing Mexican tobacco in Wheatfield valley near Miami, failure." An informant stated that no care was taken of the crop after it was planted.

Tobacco was obtained from Mexico during raids. It was a scarce and valuable commodity. A man lacking tobacco would trade a large hide or blanket for a small supply. At times those with tobacco shared it by passing a pipe from man to man.

107 Goddard, San Carlos Texts, pp. 364-65.
108 Gifford, Apache-Pueblo, p. 150.

Pipes were said to be of elbow type, though formerly tubular pipes had been used prior to the 1870's. One informant stated the last tubular pipe he had seen was one fashioned from white clay by a Tonto woman in the l890's. Pipe bovls were made of clay, and also from corncobs. A few were found in Pueblo ruins. Tobacco was smoked in corn husk cigarettes as well as in pipes.

Formerly young boys were not allowed to use tobacco. It was believed harmful if used in excess by young men.

Tobacco was often used in prayer. As an object of ceremonial importance, it was never handed careless1y. Throwing it from person to person rather than handing it gently was thought to bring bad luck.

Devil's Claw. There was no planting and cultivation in the usual sense of devil's claw (Martynia Iouisiana). However, the seeds of this plant were thrown in sandy places, washes, or beside a stream in order to have available stands close to the camps. The seeds were never stored, but always gathered from wild sources.

When devil's claw was found growing in a field it was allowed to remain unless the growth was too heavy. Only one informant, a cibecue, recalled devil's
claw being planted in a field. All others stated the seeds were broadcasted in places outside cultivated areas.

The black "hooks" of Martynia were used, after splitting, for decorating baskets. The material was strong, resisted wear, and in a rain softened instead of swelling and cracking. Martynia seeds were often cracked and chewed for their juice, which was "just like milk."

Sunflowers. The large single-headed sunflower (Helianthus sp.) was grown by the Canyon Creek (westernmost) band of the Cibecue Apache. Sunflowers were also grown in the upper Canyon Creek-Oak Creck area in the 1880's (there is no information as to whether they were present earlier than this) and in the Cherry Creek area in the $1870^{\prime}$ s and probably earlier. Bourke 109 wrote (in 1895) "...a quarter of a century ago, or less, the Moquis, Apaches, Navajoes, and Pueblos used to plant them; under cultivation, the seed-disks attained enormous dimensions;..."

Gifford ${ }^{110}$ records sunflowers as grown by the Northern Tonto and the Southern Tonto and in a note 111

> 109 Bourke, Folk Foods, pp. 47-48.
> 110 Gifford, Apache-Pueblo, p. 20. 111 Ibid., p. 665.
states that the Northern Tonto got their seed from the Hopi and that the San $C_{a r l}$ os got sunflower seeds from the Mexicans. As the San Carlos are recorded on page 20 as not cultivating sunflowers, it may be presumed that the "SC" (San Carlos) on page 665 is a misprint for "ST" (Southern Tonto).

The Canyon Creek Apache may have obtained their seed from one of the Tonto groups or from the Hopi or Mexicans (or possibly from the San Carlos or Mexicans if Gifford's "SC" on page 665 is not a misprint). Sunflowers were not grown by the Cibecue or Carrizo bands of the Cibecue or by either of the White Mountain bands. One man had seen them cultivated on the San Carlos Reservation, but others who had lived there did not confirm this.

Very few of the Canyon Creek band grew sunflowers. At Cherry Creek people were afraid of them because they "came from caves" (from the gan, mountain-cave dwelling supernaturals), and only people with supernatural powers grew them. These restrictions did not effect the Canyon Creek group.

A purple-seeded Helianthus of unidentified species grev to a diameter of fifteen to sixteen inches, "as big as my hat." They frequently were so heavy that they bent the stalk and touched the ground. Seed was
saved from the largest heads and stored in a vessel or hide sack.

Seeds were planted without prior treatment, an inch or so deep, and from one to two feet apart. At Oak Creek one family planted them around the edges of the watermelon patch, others in between corn rows or among beans and squash. At Cherry Creek they were planted only on irrigation ditches, as it was thought they would spoil other crops because of their "cave" origin. They were first watered when about eighteen inches high and subsequently if necessary. They required less water than the other crops. They might be weeded.

Sunflowers were harvested during September and October as they ripened. The heads were removed, placed on a sunny slope, and allowed to dry for about a week. They were then put on a metate and the heads broken into pieces and the seeds loosened with a heavy stick. Finally the heads and seeds were placed in a basket tray and winnowed.

It is doubtful whether the cultivation of sunflowers was ancient. The marginal position of the cultivated plant among the two Tonto groups and the westernmost band of the Cibecue (and possibly the San Carlos) would indicate a rather recent introduction, as would Gifford's information that seed was obtained from the

Hopi and Mexicans. Also, some of the Canyon Creek band and people who had lived among the San Carlos denied that sunflowers were over cultivated. This would indicate that they did not have a long-standing or a firm place in the culture. The best evidence in favor of some antiquity is the belief among the Cherry creek people that the seed of the large sunflower, together with the pumpkin and gan-dance headdresses, were given them by "the cave people" (gan).

At the present time perhaps half a dozen families raise sunflowers at cibecue, all living around the home of a Cherfy Creek man. The heads are not as large as they are reputed once to have been. In August, 1947, some immature ones measured seven to eight inches across the seed disk; the stalks up to seven feet high. In some patches there was an odd mixture of single headed stalks with large heads and multiple headed stalks with small heeds; the latter were identical with the wild variety of the vicinity.

The present plants at Cibecue may be from seed brought in some years ago by a missionary rather than from the old Cherry Creek or Oak Creek seed.

Small Grains. Prior to 1900, but after the military occupation, the Apache planted some oats, but
did not harvest this crop. It was used for forage. Rye was never raised.

Barley (Hordeum sp.) was raised prior to 1900 as the result of encouragement from agents and the military. It was sold to the government, traders, and freighters. Clum bought barley from the Apache at San Carlos in 1875, "the first time they had received money for their crops." After the barley harvest the field was immediately replanted to corn. 112

Reagan 113 states that "grain bins" in Pueblo ruins on the Fort Apache Reservation visited by him contained corn cobs and barley heads, from which the barley kernels had been removed by vermin. Possibly these heads vere intrusive from the period when the Apache raised barley, or Reagan erred in his ldentification, for all the ruins known in this area appear pre-European. The Apache stated that they vere first given barley by Americans.

Wheat was raised by some of the Western Apache prior to the American occupation. Lockwood ${ }^{1 l 4}$ quotes from the letter of a travelling Indian agent dated

112 Clum, Apache Agent, p. 163.
113 Reagan, Cliff Dwellers of Arizona, p. 296.
114 Lockwood, Apache Indians, p. 99.

August 7, 1859, that the Pinal and White Mountain Coyoteros raised wheat, corn, beans, and pumpkins in abundance. OId informants from the Cherry Creek, Cedar Fork, and East Fork districts stated that they had raised a little wheat prior to Anglo-Amorican times, and placed this definitely before the 1870 's. Oddly enough, one at East Fork stated the only old crops were corn and wheat. According to Cherry Creck tradition, their wheat had been obtained from the Mexicans at an early period.

Apparently only a small amount of wheat was raised in premilitary days. At Cherry Creek it was "always" raised, but only at one place. Wheat raising was a distinctive enough pursuit so that other Indians often called the Cherry Creek group "Wheat Field People." "Wheat Field Indian" was the regular name of the cibecue for the San Carlos Apache.

In early Agency days wheat was raised on the San Carlos, at upper Canyon Creek, at Cibecue, at Cedar Creek, at Forestdale, and on the White River. It was irrigated at all places except Forestdale. Sales to the government encouraged larger plantings. In 1883 the Fort Apache Reservation produced 12,600 pounds of
wheat. 115
Since the withdrawal of the military garrison wheat raising has practically ceased on the Fort Apache Reservation. One reason is undoubtedly the lack of a market. Another is that wheat is "too much work; nobody help." On the San Carlos Reservation, where there are binders and threshers, some soft spring wheat is still raised.

At San Carlos winter wheat was planted in November and harvested in the spring, after which the field was planted with corn. On the Fort Apache Reservation wheat was planted in March and harvested in July; no winter wheat was planted in this locality.

Wheat was formerly planted with a digging stick, the plants close together. Later it was planted with a hoe, the holes about four to six inches apart. No ashes were mixed with the seed. After the Agency was established wheat and other small grains were sowed broadcast, often ahead of the plow. After plowing a harrow, a piece of brush or a $l o g$ was dragged over the field. It was irrigated about four times, once to make it sprout, once when ankle high, once at blooming time, and finally when the heads were filling out. 116

115 Bourke, On the Border, pp. 457-58.
116 Reagan, Notes, p. 299.

Formerly heads were picked or pulled. Later scythes and sickles were used. The wheat was carried to a threshing ground. This consisted of an earth floor which had been wet and tamped hard. Here four or five horses were ridden over it for about an hour while one man stirred the wheat with a fork. After this, the straw was lifted and shaken with forks. Then the grain was thrown into the air with shovels to winnow. Finally women completed the winnowing process with baskets. Wheat grains trampled into the ground were scratched out with the fingers.

One man stated that forty years ago or so people might get from four to five one-hundred pound sacks of grain from their harvests; "people raised lots of wheat then."

Formerly women ground wheat on metates. Later some continued to do this. Others took their grain by packhorse to a mill established by the Agency at East Fork.

Reagan ${ }^{117}$ states that winnowed wheat was usually washed and dried. Informants denied that this was ever a common practice.

Green heads of wheat were sometimes picked and

117 Reagan, Loc. eit.
held over a fire, the kernels removed, placed in a pan, washed, and boiled with meat or bones. Ripe wheat was often parched in a frying pan, then ground and eaten without salt either in its dry form or after being moistened.

Whole grains of wheat were boiled with salt and meat. Old people without teeth ground this cooked preparation on a stone before eating it. Mush was made of wheat. Salt was added. This mush was sometimes made into a tamale with fat meat, but without cornhusk wrappings.

Salted wheat dough was pounded into a thick tortilla (without soda or baking powder) and cooked in ashes. When cooked, the ashes were removed by washing. This washing procedure did not cause the tortilla to become soggy, it was said, because the heat retained from the cooking dried it. Such tortillas were also cooked in modern Dutch ovens. Reagan 118 mentions a wheat flour bread baked in ashes in a wrapping of green corn husks, and also baking powder and soda bread in flat rolls which were baked in Dutch ovens. He also states that wheat flour was made into a biscuit bread fried in a skillet.

118 Ibid., p. 292.

Miscellaneous Crops. Whipple 119 states that cotton had been seen near the Western Apache rancherias. Gifford ${ }^{120}$ records cotton as formerly grown by the Southern Tonto. All the author's information was negative. It appears doubtful that much cotton, if any, was raised by the Apache.

The small black seeds of "Indian spinach," a small, red-rooted, large-leafed plant (probably lambsquarter -- Chenopodium leptophyllum (Moq.) or Nutt or Chenopodium incanum watson $)^{121}$ were formerly sowed broadcast in the vicinity of the camps. Its leaves were also eaten with soup or, uncooked, with mescal juice. The seeds were formerly ground and used as food and the sprouts boiled with meat, according to Reagan. ${ }^{122}$

Potatoes were not cultivated until the AngloAmerican period. Seed potatoes were obtained from the whites rather than selected from the previous crop. In the 1880's they were planted at the same time as corn and their care was very similar to that of corn. In

[^24]one case at Oak Creek a family planted one row of about ten hills, some fifteen inches apart, in the middle of the corn field, cutting half a potato per hill for seed. Potatoes were dug in October or November before the frost, and used quickly, as no way of storing them was knowm.

Potatoes now are planted in early April, usually in every second furrow of a plowed field. Not many are grown.

In 1883 there were 135,000 pounds of potatoes raised on the White Mountain Reservation, according to Bourke. ${ }^{123}$

Potatoes were boiled, with or without meat. An Oak Creek district informant stated that his group did not bake potatoes in ashes, fry them with grease, nor fry cakes of mashed potatoes until the $1890^{\prime}$ s.

The sweet potato was not known to the Apache except as an occasional store commodity.

Chili was not planted in aboriginal days, though at times some was brought from Mexico. At Oak Creek a small, red chili (Capsicum sp.) was raised in the 1880 's from seeds obtained from white ranchers at Pleasant Valley. It was grown on the sides of small earth mounds

123 Bourke, On the Border, pp. 457-458.
about six inches high and ten by four feet dimensions. The Apache now raise a small amount of green chili. Alfalfa is raised in irrigated fields, cut with agency mowers, and stacked or baled.

The Apache are not excessively fond of fresh vegetables. In the 1880 's at Canyon Creek cabbages (Brassica oleraces capitata) were the only vegetable raised, and those by only one man. Now some families raise carrots (Daucus carota), onions (Allium cepa), cabbage, tomatoes (Lycopersicum esculentum vulgare), cucumbers (Cucumis sativus), and lettuce (Lactuca sativa). They raise good tomatoes, and at one time raised a small ground tomato. It has been the Indian experience that the traders will not buy their vegetables or even corn, fresh vegetables being obtained outside the Reservation or from the school and missionary gardens. (The traders do purchase beef and beans from the Apache.)
Apple (Malus sylvestris), peach (Prunus persica), and other fruit trees were introduced after the military occupation. Fruit trees are still distributed by the government farmer, who makes certain that the holes in which to plant them are prepared before they are deIivered.

Miscellaneous Ritual. Many items of belief, tabu, and ritual comected with agriculture have been covered elsewhere and will not be repeated.

Agricultural rites, including prayers and songs, accompanied planting, irrigating, and cultivating. Sometimes old men walked around the inside of fields singing songs at the time the leaves of the corn turned dark, but before it had tasselled. They also walked around the edge of the field sprinkling pollen. According to Goodwin, ${ }^{124}$ the ditch bosses or other men with agricultural powers were called upon to perform a ceremony, just before the harvest, to hasten ripening.

Curtis 125 states that among the Apache ceremonies are "a rain dance, a puberty rite, a harvest or goodcrop dance, and a spirit dance."

Prayer feathers were used in fields. The White Mountain placed turkey feathers at the four corners of a field to prevent flood. No effigies were employed. The Cibecue placed a turkey feather at each corner of the field and one in the center when rain was desired; this was believed to bring rain and prevent hail.

124 Goodwin, Western Apache, p. 157.
125 Curtis, North American Indian, I, p. 133.

Bourke 126 wrote that when corn was planted the Apache medicine men buried eagle-plumes in the field, scattered pollen, and sang.

Rain-making ceremonies were conducted when rain was needed by medicine men with the requisite powers. A whole community might help pay for such a ceremony. The people probably participated with prayer and sons on these occasions, but information on the extent of this participation was lacking. A medicine man walked toward a rain cloud, made a buzzing noise, and talked and prayed for rain. Bourke 127 describes a procession at San Carlos in 1884 in which a long-handled cross was used and a rhombus twirled to imitate the sound of a gust of rain-laden wind. Palmer 128 wrote that the White Nountain tried to produce rain by lighting many fires in dead trees. This was not confirmed.

A medicine man in his late seventies stated that his powers of rain-making had been effective in all months except June. He can no longer bring rain, for he has already done it too many times and he is getting too old. When one of his sons reaches twenty-one, the

126 Bourke, Medicine Men, p. 502.
127 Ibid., pp. 476-477.
128 Palmer, Customs, p. 165.
old man may teach him rituals, but not before, since the power could be harmful to a young man. He would not teach the author, so he said, because a white man could not learn the procedure within the time limits in which it must be memorized, and it could not be written down. He himself had once learned a ceremony by writing down the names of gods and prajers and had been punished with pains in the hands and arms.

Solar eclipses were known to be caused by the position of the moon. These were thought not to hurt the crops, but everyone built fires throughout the camp and said special prayers to keep the darkness from becoming permanent.

Prayers may be said in a field to prevent hail. A medicine man may wave hail avay by holding the palms of his hands together in front of and above him, then parting them, this motion causing the hail to go to the sides. Fees of five dollars are still paid for such services. If hail started to fall on one's farm, it was stopped by chewing four hailstones, spitting them toward the cardinal points, and praying. An owner may also stand with yellow pollen or a piece of turquoise and motion clouds away from his field with the hand.

The Wite Nountain did not plant a field struck by lightning, for it was believed if a person ate the
corn his family would "dry up" with tuberculosis. People do not speak of lightning during the summer, nor will they anger it by going outside during an electrical storm or a heavy rain. Obsidian was put at the four corners of a field to keep lightning away and was also tied to children to ward off lightning and "bad things." At Cibecue a large, red, light-weight pumice stone was kept at one camp to ward off lightning.

Among the Cibecue a medicine man was said to have slowed down the progress of the summer sun by walking fast and attempting to cover perhaps fifty miles while he talked and prayed to the sun to go slow.

It was believed that raccoons could be prevented from entering the corn fields by covering their spoor with four "oyster shells," fossils. These were found in the Black River region.

It was thought to be a sign of good luck if white or silver leaves appeared on the corn stalks when they were about two feet high.

If a menstruating woman "with the blood of the underworld" or pregnant woman entered a field, it was thought the crop would spoil and turn "just like mash and rotten inside." Copulation within à field was also believed to injure the crop.

Some shamans had evil reputations and were said to use their power to ruin crops. They did this not for pay but for spite. Such men prayed for wind or frost. Later, if accused, they merely laughed and said, "No, I never did that." These men were not punished. One informant related how a medicine man had come and looked at a fine patch of watermelons. When he left, it rained on the nearby fields, but hailed on this patch of melons and ruined them. Another informant found four stalks of corn pulled from the center of his field and placed along its edge with roots toward the sun. He tracked the suspected shaman from the field to his camp. The plucking and placing of four stalks, when accompanied with the proper spell, was believed to cause a field to dry up. The victim did nothing to the shaman, but returned feeling downcast. He has had poor crops ever since.

The Cibecue believed that corn pollen would turn into or attract worms if it were not shaken off. The White Mountain denied this. Rattlesnakes were believed to come into the corn to collect and use the yellow pollen, and children would not run in the corn during pollination, for fear of being bitten:

In the girls' puberty ceremony, the girl formerly ground corn four times. This was cooked and distributed.

Goddard ${ }^{129}$ records an account of this ceremony in which a basket of corn played a part. The corn was poured over the crown of the girl's head. The spectators attempted to obtain a handful of this to plant, for it was reputed to increase crop Jield. Curtis ${ }^{130}$ gives much the same account, stating that the act of pouring corn over the girl's head was an invocation to the gods that the girl be blessed with fruitfulness. Cummings, 131 who observed this ceremony in the early 1930's, does not mention this, though his account of this ceremony is the most complete in the literature. The author did not observe this usage in ceremonies seen at Whiteriver in 1941 and 1947.

The crops and stored or cached food of a deceased person were destroyed or abandoned, though in the case of family crops or food only part might be destroyed and part left for the deceased's children. The farm of a dead person would be abandoned for two years or more. Among the cibecue crops were burned, and a horse would not be turned in to use them. The White Mountain, however, thought it proper to turn a horse onto a dead

129 Goddard, White Mountain Myths, p. 123.
130 Curtis, North American Indian, I, pp. 46-47.
131 Cummings, Apache Puberty Ceremony.
person's corn. The White Nountain also stated that they could plant over the spot once occupied by a camp in which death had occurred, which the cibecue would not knowingly do.

A kindly supernatural, Changing Woman, the mother of Slayer of konsters, has control over fertility and fruition of plants. 132

Summary and Conclusions. The Apache have practiced agriculture for at least two hundred years. Its antiquity is attested by oral traditions as well as by historical evidence.

While travelling south from El Morro, New Mexico, an Indian guide pointed out to de Vargas the mountain "Pena Lerga, in which, he soid, the Apaches Colorados had their rancheria, and that they plant maize; and it was skirted by a river or arroyo..." This was December 2, 1692. 133 The Apache mentioned may have been Navajo or Warm Springs Chiricahua, for both groups have occupied territory south of El Morro within historic times; or they may have been the Western Apache north of the Nogollon Rim, a group intermediate to or distinct

132 Goodwin, Religion, p. 26.
133 Espinosa, First Expedition of Vargas into New Mexico, p. 238.
from all these.
In the Descripcion Geografica de Sonora ${ }^{134}$ the Apache from the frontier of Sonora to the Gila are described as gatherers of wild foods "a escepcion de algunas partes de Xila y rio de San Francisco, como tambien en las vertientes de la sierra de la Florida y otras, donde suelan sembrar sus maíces las mujeres..." In the same work ${ }^{135}$ the discovery in 1737 of Apache rock granaries containing "semillas" was ascribed to a Spanish army. Another edition of this work 136 is translated by Guiteras to read that "corn" was found in the granaries in the year 1747 . The Apache here referred to were probably Warm Springs Chiricahua if that group occupied the San Francisco and upper Gila in the 18th Century as it did during the mid-19th. However, it is possible that the Western Apache, or an intermediate group, was in this area in the 18 th Century.

Zarate Salmeron ${ }^{137}$ states that in the Sierra Florida the heathen Apache "Siembran mucho maiz, frijol, 3, p. 564.

Documentos para la historia de Mexico, Series 135 Ibid., p. 503.
136 Guiteras, Rudo Ensayo, p. 126.
137 Salmeron, Relaciones, Documentos para la historia de Mexico, Series 3, p, 97.
calabazas, sandías, melones, beregenas y pepinos..." It is difficult to place the Sierra Florida of Salmeron. Bolton ${ }^{138}$ identifies the Spanish Sierra Florida, in parentheses and with a question mark after it, with the Santa Teresa mountains, the northern part of the Pinaleno mountains. There was a region called Florida by the Spanish which lay in the vicinity of the central. Gila river, 139 but there was also a Sierra Florida southeast of Deming, New Mexicol${ }^{140}$ and possibly other Sierra Floridas in New Mexico. In this case the Sierra Florida referred to was probably in southern Arizona, and the Apaches were the Western Apache (San Carlos?). If the information of Salmeron is reliable, then the earliest date for Apache agriculture is established as prior to 1626 and the number of crop plants utilized before the American occupation is greatly expanded. Possibly Salmeron's Apache are the practically unknown Apaches Mansos who eventually affiliated with the Spanish and Mexicans.

Father Bartolome Sanches 141 wrote in 1757 that

138 Bolton, Kino's Memoirs, map.
139 Documentos para $\frac{1 \mathrm{a}}{\mathrm{p} \cdot 95 \text { historia }}$ de Mexico, Series
140 Thomas, Forgotten Frontiers, p. 12.
141 Sanches, Letter in Documentos para 1a historia de Mexico, Series 4, Vol. 1, p. 92.
"Los apaches siembran milpas desde todos santos, por todo el rio Gila y en la cañada de Santa Lucía." This would apply to the Western Apache and also, possibly, to Chiricahua. In another letter 142 in 1758 Father Bartolome described a Spanish expedition which, with a captured Apache guide, penetrated north of the Gila. Here in an arroyo they saw some "milpas" and captured some vagabonds ("gandules") who stated that behind the continuous mountains was a river valley where "siembran mucho mais en él los apaches espirias ó rayados." This expedition entered Western Apache country, and the river valley referred to was not unlikely some tributary of the Salt.

A letter of Father Escalante ${ }^{143}$ narrates some details of a military expedition of 1747 in which, on the San Francisco river four days south of Zuni, there were "various rancherias of Apaches who cultivate the valley and with the aid of irrigation, harvest much yellow corn." These Apache were Warm Springs Chiricahua, unless Western Apache or an unidentified group held the region at this time.

The same letter ${ }^{144}$ included information of a

142 Ibid., p. 95.
143 Thomas, Forgotten Frontiers, pp. 155-56.
144
Ibia., p. 156.
pursuit of raiding Apaches from Zuni in 1754. Three days south of Zuni an Apache rancheria was attacked, near which "is a little river and on its banks various Apaches who do not roam about or have horses but much yellow corn." Escalante believed this river might be the San Francisco. If so, the Warm Springs Chiricahua are again indicated as the Apache probably encountered.

According to their traditions, the Apache acquired their crop plants from various peoples, both friends and enemies. Neighbors specifically named were the Hopi, Zuni, Pima, and Mexicans. Bourke 145 was told of traditional relations with Pueblo peoples on the Sierra Ancha, the Sierra Mazitzal, and the Rio Tonto. A Mexican who had been a captive of the Western Apache in the 18 th Century stated that these people were hereditary friends of the Zuni and occasionally bought a Zuni wife. 146 Prior to the Pueblo Revolt of 1680 the New Mexico Spaniards travelled through the Apache country to the Pimas, 147 and Cooke, 148 during the War with Mexico, met parties of New Mexicans trading among

145 Bourke, Early Navajo and Apache, pp. 289-90.
146 Dorr, A Ride with the Apaches, p. 45.
147 Bolton, Kino's Memoirs, II, p. 257.
148
Cooke, Journal, p. 137.
the Apache. Gregg ${ }^{149}$ also noted the New Mexico trade with the Apache in 1840. Old Apache had told an informant when a boy of Mexicans who had traded or given seeds to the Apache in former times.

Though the Apache have had long contact with the Navajo, sometimes friendly, oftener not, no informant mentioned corn or other plants being obtained from them. The Western Apache word for corn, nata', is similar to the Navajo word $n$ à. d $\underset{c}{a}$, which was analyzed by Sapir 150 as probably meaning "food of the enemy."

The earliest crop plants, on the testimony of Apache informants and on the evidence of associated ritual, were corn and pumpkins. Beans were much more recent, judging again from the testimony of informants and the lack of ritual associated with them; however, beans have been cultivated by the Apache for at least one hundred and fifty years. Wheat has been cultivated for at least ninety years. Cotton was probably cultivated only sporadically, if at all. Gourds were cultivated, and tobacco and devil's claw were semicultivated. The sunflower was probably cultivated only within the last eighty years and then marginally among

149 Gregg, Commerce, pp. 193-94.
150 Sapir, Internal Linguistic Evidence, pp. 228231.
the Tonto and Canyon Creek band of the Cibecue, though the evidence is not abundant. Other crops, if Salmeron's reference to "sandias", etc., be disregarded, were not known to be cultivated prior to the American occupation. No crop approached corn in importance. All who farmed planted more corn than any other crop. Pumpkins were not planted by all people, and those who did raise them did not plant them every season. They could be used only during the harvest season and prior to heavy frost, and they appear to have been considered a luxury addition to the diet rather than a staple. Beans were not highly regarded and were not planted by all. At a time shortly before the American occupation wheat appears to have been a more important crop plant than beans, though it was not planted by all and in no way rivalled corn.

> Prior to the establishment of the Reservation, agriculture was not as important to the Western Apache as either hunting or the gathering of wild plant foods. Its importance varied from group to group. Among the Northern Tonto, only the Fossil Creek band farmed a little. Many bands among the Southern Tonto and San Carlos groups did not farm. Perhaps sixty percent of the White Mountain farmed and eighty percent of the Cibecue, though the extent of farming also varied
greatly from local group to local group and from family to family. Among the cibecue the farming population varied from nearly one hundred percent in the cibecue band to about fifty percent in the Canyon Creek band. The proportion of agricultural products in the diet not only varied with the extent of farming, but differed from year to year and from season to season. Prior to the American occupation agricultural foods, principally corn, constituted perhaps twenty-five percent of the total foods used by the white Mountain and Cibecue groups. Perhaps thirty percent of the food of the Cibecue band was agricultural, while at upper Canyon Creek such food made up only about ten percent of the diet. It was impossible to form any estimates for the other groups. Goodwin ${ }^{151}$ states that the White Mountain diet formerly contained from twenty to twenty-five percent of domestic plant foods.

Informants generally rated meat (both wild game and livestock obtained in raids on Mexican settlements) as more important in their diet than corn. With some, corn formed a greater part of the diet than wild plants; with others it was used less extensively.

Though not the primary base of economic life as

[^25]among the Pueblo, agriculture played a significant role in the social values and attitudes of the Western Apache. There was a feeling of attachment to the agricultural home sites, which were always regarded as "headquarters." The ownership of farming sites conferred a certain prestige, and the products of the farm enabled an owner to play the highly respected role of the generous donor of food.

The ownership of farm lands was often identified with chiefs, "rich" men, or "big" men. Frequently owners were assisted in cultivating their farms by those without farms, such assistance being rewarded with food during the working day and later, usually, with a small part of the crop. Others who had not helped were often given farm products for the asking. In this way owners acquired the admiration and gratitude of those to whom food was paid or given, and a patron-client relationship was created. Agricultural products, which could be readily stored, added to the economic security and independence of farm owmers. They were able to maintain a higher standard of living and to offer better entertainment, further increasing their prestige and status in the community.

Attitudes toward farming differed from group to group and family to family. Some did not care to farm.

Among the White Mountain and Cibecue most people liked to farm, even though not all were farm owners. A good farmer, usually a woman, was respected for her ability and industry.

Because men were primarily engaged in the hunting quest and in raids, women did most of the farming and were generally regarded as the better farmers. Nevertheless, there was nothing degrading or demeaning in farm labor for a man, and many men participated actively in farming.

Agriculture did not force a sedentary form of life upon the Apache. These Indians frequently left their fields unattended while they moved to gathering or hunting grounds. Planting and harvest times were the only seasons which absolutely required residence at the farm sites.

Possibly the tendency of the Apache to live and operate economically in small extended matrilineal family units was reinforced by the possession of farm lands in the lineage. The labors of a son-in-law on the family farms were often needed and his affinal relatives felt themselves entitled to his services. Chieftainship was usually roinforced by the possession of farm lands, for it was highly desirable, if not essential, for a leader to be above the average in
economic status. A chief's economic independence and ability to help dependents with gifts of food were greatly increased by the ownership of farm lands. The evidence does not indicate that prior to the American occupation there was in progress any shift from hunting and gathering to a ereater dependence upon agriculture. Though new farming areas were developed, they were opened not as additional agricultural lands but as replacements for lands which, for one reason or another, had been abandoned elsewhere. Such displacement is recorded for the Bear Springs district, where the underground water failed, and at Carrizo Creek, where a quarreling clan fled from their enemies. With the advent of the American soldiers agricultural activities diminished until after the pacification was completed. The Apache were often too harassed and fearful to plant or to linger in the vicinity of their fiolds to tend them. The military practice of destroying Apache crops discouraged planting.

After military posts were established on a permanent basis in the Apache country, an effort was made to concentrate the Indians around these centers of American administration. Hunting and gathering excursions were discouraged or forbidden. The military
and civilian agents attempted to encourage agricultural development to occupy the time and energies of the Indians and to make them at least partially independent of government rations.
Agricultural activity at first was made more
difficult under military supervision by the enforced concentrations, for it was forbidden to leave the vicinity of the agency to cultivate the old planting grounds. 152 Frazer, 153 from estimates supplied by military agents, states that in 1883 there vere 875 acres in cultivation on the Fort Apache Reservation, but these figures include no estimates on the White River and Cedar Creek areas. For 1884, with estimates on all farming areas included, he states there were approximately 3000 acres cultivated by 1600 Indians (the Chiricahua on the reservation at this time were excluded from the estimates). Estimated crop yields for $1884^{154}$ were 40,000 pounds of barley, 2,000,000 pounds of hay ( 1883 figures), and 2,000,000 pounds of corn, in addition to which 300 acres of cabbage, beans, melons, and pumkins were raised. In 1886 an estimated 1469 White Mountain Apache were

152 Report, Commissioner of Indian Affairs, 1874, pp. 286-87.

153 Frazer, Apaches of the White Mountain Reservation, p. 14.

154 Ioc. cit.
reported to have raised "no wheat this year," 70,000 pounds of barley, and 120,000 pounds of corm. 155 In 1892, 1200 acres were cultivated on the White Mountain division of the Apache reservation. On this land 7143 bushels of corn were raised, no barley, no wheat. 156 In 1899 an estimated 1849 Indians cultivated 1240 acres, raising 321 bushels of barley, 2275 bushels of corn, and ten bushels of vegetables. 157

In the official annual report for 1947 by the Extension Division of the Whiteriver Agency the following agricultural figures were given. of a total 1019 acres harvested, 216 acres were in forage crops, 788 acres in corn, and fifteen acres in beans. An additional 16 acres of garden crops and the yield from 1648 fruit trees were harvested. Field crops yielded 397 tons of forage, 4707 bushels of corn, and 6300 pounds of beans. The unofficial census estimate of population on the Fort Apache Reservation in 1947 was 3350 .

All the foregoing figures are far from satisfactory. Earliest official statistics on acreages and crop

155 Report, Commissioner of Indian Affairs,
p. 41 . 1886, p. 41.

156 Ibid., 1892, pp. 802-803.
157 Ibid., 1899, pp. 582-83.
yields are but estimates, at best. For years the official reports of the Commissioner of Indian Affairs gave only consolidated figures on the Fort Apache and San Carlos Reservations, which included at various times Yavapai and Chiricahua as well as various badly scrambled groups of Western Apaches. Nevertheless, it will be noted from the above figures that agriculture on the Fort Apache Reservation has fluctuated greatly during the American occupation. Traders and missionaries who have long been resident on the reservation, as well as the Apache, confirm this. The reasons are various. Successive agents have alternately encouraged agriculture and attempted to divert Apache energies and resources into stock breeding. Irrigation projects have not withstood the effects of flooding, or have failed to supply the expected amount of water. Cash income from off-reservation employment, from government makework and relief activities, and more recently from military allotment checks has varied; as such income has increased, agricultural activities have declined, and vice versa.

Advantage has never been fully taken of the agricultural opportunities offered by the Fort Apache Reservation. Ioday, especially when one considers the improved agricultural tools and techniques accrued
through white acculturation, the Apache is making proportionately less use than ever of such opportunities.

## CHAPTER II

## HUNTING

Formation of Hunting Parties. Only adult males hunted large game. Often single individuals hunted deer; other game usually required the cooperative services of several men. Hunting parties might consist of as many as twenty men. The usual party, however, was made up of from three to five, except in an antelope hunt, for which more were needed. Old men not sufficiently active to accompany the young on raiding forays hunted in the vicinity of the camp sites.

All men participated to some extent in hunting as a matter of necessity, and every man knew the eustomary hunting methods and ritual. However, there vere a few with special hunting "powers" obtained by vision or through tutelage. These were specialists in one or more of the hunting fields and they were sought as leaders or advisors. Chiefs or headmen were often skilled hunters and led hunting parties. The White liountain stated that only religious practitioners with "bear power" could hunt that animal; this was probably duplicated among the other Western Apache. Girls accompanied adolescent boys at times on nocturnal hunts for birds. Other participation by women occurred in occasional quail drives in which the
young and old of both sexes joined. 1 They did not take part in rabbit surrounds and drives. Though women did not often accompany a hunting party, Goodwin ${ }^{2}$ records an incident in which a newly wed couple went on a five day hunting trip.

Areas and Migrations. Western Apache informants denied that there were individually or fanily owned hunting tracts. However, the Eastern White Mountain chief, Diablo, claimed an unmarked tract adjacent to his farm as his private hunting area and it was not trespassed upon. ${ }^{3}$ It was customary for strangers who wished to hunt near a farm settlement to ask permission of a local chief or influential man. 4

Goodwin ${ }^{5}$ delimits the general territories hunted over by some of the Western Apache bands. In general the favored spots were timbered or mountainous. Though hunters went north of the Mogolion Rim, they usually hurried southward again for fear of the Navajo. To the

1 Goodwin, Western Apache, p. 475.
2 Ibid., p. 332.
3 Ibid., pp. 149-50.
4 Ibid., p. 150.
5 Ibid. , pp. 12-44.
southeast parties sometimes journeyed as far as the San Francisco River in New Mexico. The eastern limits were the east slopes of the White irountains and the top of the Blue mountains, fear of the Navajo keeping them from going farther. To the northwest some of the Tonto ranged to the San Francisco Mountains. They hunted in the Mazatzals on the west and as far as the Hayes Mountains to the south. Eastman ${ }^{6}$ mentions a small White Mountain party which penetrated Mescalero territory on a buffalo hunt, but this was far outside the usual range.

Informants indicated that a majority of the Canyon Creek, Cibecue, and Western White Mountain bands wintered south of the Black-Salt rivers. Normally four to six months were spent in these areas. Winter camps were moved every fifteen days or so and the men spent their time, when not "just sitting around," hunting deer. According to Goodwin, 7 favorite winter locations for migrating Western Apache groups or families were along the foot of Natanes Rim or at places in the Gila Range, as well as lower slopes of the Graham, Santa Teresa, and Turnbull Mountains below the pinon-juniper

[^26]belt.
Goodwin ${ }^{8}$ stated that hunting parties never stayed out more than a few days, did not range far from home, and that women did not usually accompany such parties.

Seasons. Men spent much of their time hunting, but were particularly active during late spring and fall. In the spring, food supplies were low and the first wild food crops of the season were not yet available. The autumn was considered the best period for hunting, since meat and hides were then prime. 9 From the end of November until April hunting and raiding were practically the only economic pursuits. 10 Informants stated the best time to hunt was when animals could be tracked in the snow.

Boys' Training. A boy was encouraged to hunt small game as soon as he was old enough to leave camp by himself, usually around the age of eight. He was taught to shoot by his father or some older person. Boys' hunting parties set forth with slings and miniature bows and arrows. At the age of twelve, a boy

8 Goodwin, Social Divisions, p. 61.
9 Loc. cit.
10 Goodwin, Western Apache, pp. 157-58.
hunted quail, rabbits, squirrels, and woodrats. By the time he had reached puberty he was an accurate shot and adept at hunting small game. 11

At the age of fifteen or sixteen a boy was taken on his first deer hunt by his father, uncle, maternal grandfather, or other near relative. Occasionally several grown boys accompanied a party hunting large game, performing the camp chores while they obtained experience. They were given the less desirable portions of meat when it was divided. Knowledge was acquired more through observation than from direct instruction. ${ }^{12}$ Many youths did not hunt deer until after their marriage, and probably none bunted alone until marriage. Some ritual hunting practices, such as the method of skinning, and part of the songs, were learned early in the apprenticeship. However, actual hunting "power" was not gained before the age of twenty. "Hunting pover was dangerous and not a thing for a bungling youth to meddle with; his heart would not be strong enough to stand it; it could make him ill or even kill him."13

11 Ibid., p. 475.
12 Ioc. cit.
13 Ibid., p. 476 .

Pride and the fear of ridicule spurred a boy's efforts. Goodwin ${ }^{14}$ tells of rat hunts in which it was a rule not to quit once they had started after a rat; the older boys laughed if a rat vere permitted to get away.

A Canyon Creek informant told how, in the mideighties, his San Carlos father took him on hunts. He was only five or six when these trips began, and was taken on successful deer hunts over a period of three years. As he rode behind his father on the horse or trudged behind him when he stalked, his "father talked, 'this is the way they hunt. "" The boy was allowed to help carry the meat to the horse and was taught how to pit bake meat. At times his father would exhort, "Hunt. Don't be afraid of horses. Exercise every morning and make yourself strong or sometime you'll get a hard job and give up right away. If you exercise aIl the time, then you'll be a man. Some people just walk around, don't run, don't work, don't work their field, just look around. Some people just look at their wife-wonder what their wife is going to do. You help your wife; you go a long ways and hunt deer pretty good and carry it home. That's the way to help."

[^27]Later this informant hunted small game with other boys. Rabbits, birds, squirrels, rats, and mice were 211 hunted with the bow and arrow. Birds' nests were raided. Some boys made fires, cooked and ate their game, but this informant always dutifully took his home.

He was shown how to make bird blinds by his
father. An old man carefully taught him how to make a rock deadfall trap. Boys listened raptly to the tales of an old hunter.

A White Mountain man told of being sent to hunt by his foster-mother at the age of eleven when the family was in dire need of meat. This woman, a maternal aunt, was exceedingly proud of him when he brought back a wild pig. She distributed a portion of the kill to every household in camp, as was customary with the first of each species of animal a youth killed. Recipients of meat so distributed said a prayer for the young hunter's future sucess, "may he always be lucky." Among the White Mountain there was no tabu against a boy's eating his first kill. However, Gifford ${ }^{15}$ reports that Northern Tonto boys were not allowed to eat their first four kills.

15 Gifford, Apache-Pueblo, p. 9.
.2062 s \%

Weapons. The bow and arrow were the most important hunting veapons. The White Mountain bow was described by one informant as a flat self bow about three and a half feet long (the same length as the arrow) with a very strong pull. Some Indians wrapped sinew around the bow to increase its strength, but this varied with individual taste. The bow was said not to be backed with sinew, only wrapped. (Gifford ${ }^{16}$ stated* that the Wite mountain used a "trussed" bow with sinew cord down the back.) Buckskin was also wrapped about the bow by some Apache.

The tonto groups used a re-curved bov, but among all other it was nearly straight. 17

Informants stated the bow was made of mulberry wood. From the literature it would appear that Apache bows were also made of ash, 18 juniper, 19 willow, walnut, black locust, and other wood. 20

Gifford's ${ }^{21}$ description of bow lengths in terms

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\begin{aligned}
& 16 \text { Ibid., p. } 30 . \\
& 17 \text { Ibid., p. } 29 . \\
& 18 \text { Palmer, Customs, p. } 165 . \\
& 19 \text { Bourke, Vesper Hours, p. } 57 . \\
& 20 \text { Gifford, Loc. cit. } \\
& 21 \text { Ibid., p. } 119 .
\end{aligned}
$$

of "to armpit," etc. may be roughly interpreted to mean that lengths varied from three and a haif to four and a half feet, with the Northem Tonto shortest, followed by the white llountain and San Carlos, Cibecue, and Southern Tonto in ascending order. The Tonto (Northern or Southern undifferentiated) bow was described by both Mollhausen 22 and Smart ${ }^{23}$ as about five feet in length, the arrows being three feet.

All groups used sinew from the back and leg of the deer and two-ply vegetable fiber for bow strings, according to Gifford. 24 Informants stated that rawhide was also used by the Cibecue and White Mountain.

To make a bow, the Northern Tonto first removed the bark, then allowed the wood to season before shaping it with a stone knife and filing stone. They and the Southern Tonto heated the wood and bent it to the desired shape in a tree crotch. The San Carlos placed pitch on their bows to insure that they kept their shape, while the Cibecue painted the bow with creosote gum to straighten it. The White Nountain put mescal juice on the concave side of the bow to straighten

[^28] of such applications.) According to Gifford, 26 the bow was held horizontally, obliquely, or vertically by the Southern Tonto; vertically or obliquely by the Cibecue; vertically by the San Carlos; horizontally or vertically by the White Mountain. All groups used a hide wristguard, and all used the Mediterranean arrow release. 27 Cibecue and White Mountain informants indicated that the bow was held vertically, while the position of the arrow release might vary with the individual. Some Apache used a three-fingered pull on the bow string, with the arrow between the index and midale fingers (Mediterranean); others used a two-fingered pull with the thumb and index fingers steadying the arrow; others pinched the arrow between thumb and index finger and pulled it back against the string.

Bourke 28 stated that the range was "not much over 150 yards," but that the penetrative power of the bow was great.

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25 Ibid., p. 119.
26 Ibid., p. 30.
27 Ibid., p. 31.
28 Mason, Arrows, p. 73.
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Apache arrowis were made of reed, with a wrooden foreshaft. The reed used was called by the Apache "arrow grass."29 The Western Apache also used one piece wooden arrows made of willow or other woods. 30 Hands, teeth, and wrenches of stone, pottery, wood, and horn were used for straightening arrows. 31 Headless arrows were used for practice and for birds and small game. 32 Arrows with four cross sticks lashed to the point were also used for hunting birds. 33

Radial feathering with three feathers was used by all Western Apache, according to Gifford. 34 Smart 35 states that four strips of feather placed six or seven inches up the shaft from the butt were used by the Tonto. Tangential, double feathering was used by Northern Tonto, Southern Tonto, and San Carlos. All Western Apache groups used hawk and turkey feathers. Eagle feathers were used by the Southern Tonto, crow feathers

29 Ibid., p. 71.
30 Gifford, Apache-Pueblo, p. 30.
31 Ibid., pp. 31 and 121.
32 Ibid., pp. 30 and 120.
33 Ibid., p. 120.
34 Ibid., p. 31.
35 Smart, Tonto, p. 418.
by the Southern Tonto and, to some extent, by the Northern. Beside sinew wrapping, the cibecue also used pinon pitch to fix the feathers. 36

The fletched part of the shaft was painted in distinctive patterns by each group. Northern Tonto colors were blue and red, Southern Tonto black and red encircling bands on a yellow ground color, Cibecue red and black. The White Mountain used a black band at the base of the cane arrow, with a red band, made from red clay and pinon gum adjoining. The San Carlos used a lightning design. 37 Tonto foreshafts were colored as if with the blood of some animal. 38

Foreshafts were attached to the canes by gum. Smart ${ }^{39}$ stated that in some cases the foreshaft was also withed into position firmly, in others only lightly attached.

Bourke ${ }^{40}$ stated that heads were fashioned from obsidian, sheet-iron, hard wood, and beer bottles. He had noted many varieties in shape, often in the same

36 Gifford, Apache-Pueblo, pp. 31 and 121.
37 Ibid. p. 120.
38 Smart, Tonto, p. 418.
39 Ibid., p. 419.
40 Mason, Arrows, pp. 71-72.
quiver. The Apache produced a flint (chert?) or obsidian point in from five to eight minutes. 41 Gifford ${ }^{42}$ stated that stone arrowheads with a tanged base were used by the Southern Tonto and San Carlos; with a stemmed base by Southerm Ionto, San Carlos, Cibecue, and White Mountain; with a concave base by Northern Tonto, Southern Tonto, and San Carlos; with the base side-notched by the Southern Tonto; with a convex base by the White Nountain (no other group being asked); with serrate sides by the Northern Tonto and Southern Tonto. The serrate head was used by the Northern Tonto for the hunt only, especially for deer and bear; it was reputed to hasten death by lacerating the animal's internal organs. Detachable heads were used by Southern Tonto and White liountain. 43. The eibecue hollowed out the tips of mountain sheep horns with a heated stone point, sharpened them, and attached them to arrow shafts with pinon gum and sinew. Mountain sheep horn was said to be used for no other purpose. (However, Gifford ${ }^{44}$ states that

[^29]arrow wrenches of perforated female mountain sheep horn were used by the Northern Tonto, San Carlos, and Cibecue, the latter obtaining it by trade.)

Quivers were fashioned with separate compartments for bow and arrows by the Cibecue and White Nountain and also 45 by the Northern Tonto and Southern Tonto. The San Carlos and Cibecue also strapped the bow to the outside of the quiver with buckskin. 46

The most highly prized material for quivers was the skin of the mountain lion, which was reputed to keep the arrows dry and also, undoubtedly, was believed to have ritual significance. It was so highly valued that a horse was given in exchange for a pelt. Gifford ${ }^{47}$ also mentions the use of wildcat skin by the Southern Tonto, coyote skin by the San Carlos, and deer skin by the Southern Tonto, San Carlos, Cibecue, and White Mountain.

Gifford ${ }^{48}$ stated that a cased skin quiver was made by the San Carlos of coyote hide; that all groups made open-skinned, sewn hide quivers. In the latter

$$
\begin{aligned}
& 45 \text { Ibid., p. } 32 \text {. } \\
& 46 \text { Loc. cit. } \\
& 47 \text { Loc. cit. } \\
& 48 \text { Ibid., pp. } 32 \text { and } 121 .
\end{aligned}
$$

type the Tonto groups left the mountain lion tail on the quiver, the Southern Tonto cutting it open and painting the interior yellow. The Southern Tonto fashioned the quiver from a rectangular piece of buckskin. The bottom consisted of a left-over piece of hide. To insure rigidity a stick was sewed along one side. The diameter at the top was slightiy greater than at the bottom. 49

Quivers were carried on the back in order that an arrow could be jerked out over the shoulder.

Spears were used in hunting hibernating bears and also, at least by the White Mountain, occasionally in hunting elk and antelope. A Cibecue informant who, as a boy, had travelled in White Mountain and San Carlos country, stated that as late as the mid-eighties most of the "old" (elderly) people carried five or six foot lances with iron points. These points were a foot long and two inches wide. He had seen horses and cattle killed with them, but believed they had been used primarily for bear and in war.

Smart ${ }^{50}$ states that the Ionto used lances with a knife or bayonet socketed on the end of a "Iong" pole.

[^30]$0 g l e^{51}$ had been told by Barnes, a soldier at Fort Apache about 1880, that the Apache lance was fourteen feet long, made of agave stalk, reinforced at points of strain with deer sinew, and pointed with a bayonet head. Gifford 52 reports that the San Carlos used a one-piece spear of ash, eight feet long; that the Cibecue had a sotol stalk with an inserted two-bladed, hardwood point; and that some groups used stone and iron points. Several White Mountain and Cibecue informants denied that throwing sticks were used, though one Canyon Creek man stated that long (six foot) sticks were occasionally thrown at rabbits. However, Gifford 53 states that straight throwing sticks were used for hunting rabbits and small game by the Northern Tonto, Southern Tonto, San Carlos, and White Mountain.

A club was made by removing the bone from the upper end of a cow's tail, inserting a round stone, and sewing the skin over this. A White Mountain man stated that this club was used for dispatching an animal after it had been run down; Cibecue informants denied its use.

[^31]Gifford ${ }^{54}$ notes that all the Western Apache used a wet stick twisted in fur to pull rodents from their holes, that all except the Southern Tonto used a notched stick, and that none used a hooked stick. Bourke 55 observes that Apache boys used curved "rat-sticks." Some informants had used the notched stick, which was moistened with spittle. One had seen an old Apache man use a long stick with a sharpened hook on the end to draw rats and rabbits from their burrows.

Cibecue boys used the sling as a toy and for battles among themselves, not for hunting. White Mountain boys used it in hunting birds and small game, though not as frequently as the bow and arrow. The sling consisted of a diamond-shaped section of hide to which thongs were attached. The patch was cut from the neck of the deer "where thick", and the corners of the diamond were squared. The dimensions were about three to four inches by six to seven inches. Thongs were twenty-four to thirty inches in length. Onethong terminated in a loop which was placed over the middle finger. The other thong was held between the thumb and index finger until time for its release. The sling was

54 Ibid., p. 6.
55 Bourke, On the Border, pp. 129-30.
twirled around the head, sometimes once, sometimes several times. No knot or stick was used in the thongs to improve the grip. Gifford ${ }^{56}$ states that all the Western Apache used the sling for killing birds. The Northern Tonto sling was of yucca-leaf fiber. ${ }^{57}$ Informants believed the sling to be an old Apache implement. While rocks were usually obtained on the spot where used, they were sometimes carried in a sack. Cibecue boys used to carry four slings, one in the hand, an extra over the shoulder, and one or two tied to the legs.

A White Mountain informant claimed that antelope were once taken with the lasso, used from horseback.

Arrow Poison. Arrow poison was used to some extent by all the Western Apache. Gifford 58 states that the Northern Tonto and San Carlos used it for war only, that it was used both for war and hunting by the Southern Tonto, Cibecue, and White Mountain. A Canyon Creek informant stated that "a long time ago" all the Apache had used arrow poison, but that in more recent times

[^32](during the hostilities with the Americans) not all individuals had continued to use it. It appeared that the making of arrow poison varied not only from group to group but with the individual concocters. A Canyon Creek informant described the process as follows. A small internal organ "like a stocking" from the top of a cow's stomach was hung until it rotted. Wasps were caught and held against this rotted organ until they stung it. Then pigeon blood was added. The material was kept about two weeks, then mixed with burnt cactus spines. The substance was then placed on arrows and spears, both point and shaft, to a total length of four or five inches. It was used both in war and in the chase. A mere scratch by an arrow so treated was reputed to cause a deer to swell up and die.

An old White Mountain scout stated that only a few of his people could make arrow poison and that these kept their processes secret. His tutor had instructed him never to tell anybody how to make it. His poison was made from fixed proportions of different kinds of bitter roots. These were pounded, moistened, ground fine, and mixed with deer's blood. The substance dried like a powder. When used, this powder was moistened and rubbed on an arrowhead with two sticks. It was
highly prized and closely guarded. The poison was said to be effective only on animals, not on human beings. It could be swallowed without harm. A small scratch was said to be fatal to a deer.

Hoffman, 59 Palmer, 60 and Gifford ${ }^{61}$ describe some of the ingredients and processes used in the making of arrow poison by various Apache groups. All involved the putrefied inner organ of some animal; into this organ the venom of rattlesnakes and insects, and various plant substances were introduced.

Bourke, 62 who had an opportunity to observe the effects of "poisoned" arrows on men and animals struck by them, expresses a disbelief in their virulence. Dr. Hoffman ${ }^{63}$ states that wounds showed symptoms of septicemia rather than of rattlesnake (Crotalus sp .) venom, the poison supposedly used.

Pets. Information on pets was contradictory. Some informants, both White Mountain and Cibecue, denied

59 Mason, Arrows, p. 69.
60 palmer, Customs, p. 167.
61 Gifford, Apache-Pueblo, pp. 31 and 121.
62 Nason, Arrows, p. 74.
63 Ibid., p. 69.
that the young of any animals or birds had ever been kept. Others from both groups stated that prior to the arrival of the Americans, young turkeys were occasionally raised. Goodwin ${ }^{64}$ states that young turkeys were occasionally put in a "turkey basket" and kept as pets. Turkeys were fed grasshoppers and corn and became so tame that they "followed the people just like a dog." However, they nested away from camp and, after their young were hatched, disappeared. For this reason, and because the Apache were nomadic, turkeys were usually killed as soon as they attained full growth. Small feathers of the turkey were used for arrows, but the birds were always killed before being plucked. One man stated that wild turkeys could not be tamed, though his people had tried; only "those that came from white people" vould not wander off.

Several informants said that fawns were not captured alive because it was "bad luck" or "the gods didn't like it." Only one man, who had spent part of his boyhood with his father's San Carlos relatives, told of taming deer. He had been told that young deer were kept, both before and after the Americans came. They were fed a milky liquid made from hot water, dried

64 Goodwin, Myths and Tales, p. 54 f.n.
mescal juice, and crushed walnuts until they were old enough to graze. They were killed and eaten when a distant trip or change of residence was contemplated. The same informant stated that in pre-Reservation times people raised coyote whelps, but that these ran off as soon as they were large. Small rabbits, gophers, and squirrels were occasionally kept. Quall were also kept at times; these would run in and out the wickiup. The young of mountain lions, bobcats, and skunks were not tamed. The young of raccoons were not kept to maturity, for they "grew up too wild." In the late seventies a San Carlos man brought home a small owl and kept and fed it until it died, thereby frightening others because of the Apache belief that the spirits of the departed take the form of owls.

Goodwin ${ }^{65}$ relates that one of his informants
claimed only members of clans related to eagles had the right to tie young eagles in their nests, allow them to mature, then pluck and release them. Apparently this was the only informant of Goodwin's who knew of this method. The author's informants denied this and stated that an eagle was always killed before plucking.

65 Goodwin, Western Apache, p. 112.

Dogs. There viere few dogs among the Apache during the period of hostilities with the Americans, since it was feared their barking would disclose the location of camps to the soldiers. Prior to this time those exposed to raids from Indian enemies often took the same precaution.

One instance was told of a Canyon Creek man whose dog was so well trained that he would not bark when both dog and owmer hid from American soldiers. A few dogs were trained to catch and retrieve rabbits or other small game. Dogs were not trained to retrieve from the water.

Aside from the occasional running down of small game or quail or treeing of squirrels, dogs were not much used in the hunt. The White Mountain stated that dogs were used to run down deer only if the hunter had shot all his arrows. A Canyon Creek informant stated that dogs were occasionally used to trail and hold deer at bay until the arrival of the hunter. They were especially useful in tracking a vounded deer. To train a puppy for this purpose, the feet of a deer were split, heated over a fire, and then held forcibly to the nose of the "crying" animal. Gifford ${ }^{66}$ records that the Cibecue also placed the feet of turkeys and rabbits

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66 \text { Gifford, Apache-Pueblo, p. } 86 .
$$

over a dog's nose for the same reason.
Instances of castration of dogs were remembered by two Canyon Creek informants, but the practice was never general and was not held to be of value. (only one other instance of animal castration was recorded. In this case a San Carlos great-grandfather of the informant had castrated and raised a fawm until "big and fat" for butchering.)

Informants did not believe the dog was ever eaten. However, the cibecue at one time ate the wolf and coyote, though the White Mountain did not. Neither group ate the fox.

Herbivores. Deer (Odocoileus spp.), antelope (Antilocapra americana), elk (Cervus merriami), and mountain sheep (Ovis canadensis) were important food animals, particularly the first. Hunting methods were usually confined to individual stalking or to small drives, though large parties among some groups are recorded as using the surround and fire drives.

Mountain sheep hunters habitually worked in pairs among the Canyon Creek group, one in ambush while another drove the animals. The sheep were once numerous In the mouth of Canyon Creek, and were also at Tortilla Flat and in a canyon near Roosevelt. They are still to
be found in the latter place. The white Mountain used blinds of brush or rock in the Salt River canyon when hunting sheep. There appeared to be no tabus connected with the use of mountain sheep horn or skins, but the horn was used only for arrow points and the skin only for breech clouts. Goodwin ${ }^{67}$ records a tale which purported to account for the fact that mountain sheep must never be pursued or "buckskin" made out of its hide, but informants did not mention such restrictions. The antelope was said to have been numerous at one time in the vicinity of Cedar Creek and Fort Apache. Antelope were driven toward hidden hunters by horsemen waving hide robes. At other times relays of men would run them down on horseback. When hunted by horseback they were killed with bow and arrow and spear and even lassoed, according to a White wountain informant. White Mountain stalkers used the whole headskin of the antelope and painted their bodies with a mixture of yellow clay and white lime. When close to the game the man held his weapons against his chest. Another hunter attracted the attention of the antelope while the masked man crept within range. No game calls were used for antelope, but the antelope was said to

67 Goodwin, Myths and Tales, pp. 130-31.
stop at the sound of a loud yell.
Brush or rock blinds vere occasionally used in hunting antelope, as for mountain sheep and deer. Antelope were said not to be hunted with dogs or to be driven over cliffs. Gifford 68 reports the circle surround and corral drive for antelope among the two Tonto groups. The Southern Tonto were stated to surround only young antelope, which were caught by hand and killed by pressing the foot over the heart. The Northern Tonto appointed an antelope hunt leader. 69 Their antelope corral was an enclosure about 100 yards in diameter, built of juniper branches and trunks laid horizontally. The wing of the chute extended one-eighth of a mile and was built over a ridge. Two men were stationed at the juncture of the chute and the pound. Six or eight men howling like wolves drove the antelope toward the chute area. When the animals were impounded, four men went to the center of the corral and shot the animals, each shooting in one of the cardinal directions. One beast was released for good luck. ${ }^{70}$

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68 Gifford, Apache-Pueblo, p. 7.
69 Ibid., p. 84.
70 Ibid., p. 85.
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Cremony ${ }^{71}$ states that Chiricahua hunters dressed in the skin, head, and horns of the antelope and imitated the actions of the animal as they approached them. He also described the stalking of antelope by waving a red rag on a yucca stalk by the Mescalero. ${ }^{72}$ Western Apache informants denied the waving of flags or of legs to hold the attention of antelope. A Mescalero surround consisting of a double circle of ninety-six horsemen killed eighty-seven antelope. 73

With the exceptions noted above, antelope were hunted in the same manner as were deer.

The elk was formerly eaten by all people. Today the White Mountain or Cibecue will not hunt or eat the animal. This aversion to elk dates to a time some years back (subsequent to 1912) when a number of people became ill after eating elk flesh. Here is a conerete illustration of one manner in which a food may become tabued.

Among the White Mountain, groups of three, four, or five men hunted elk by circling and driving them toward one or two of their number in ambush. The antlers

71 Cremony, Iife Among the Apaches, pp. 28-29.
72 Ibid., pp. 291-92.
73 Ibid., pp. 204-205.
were never kept, but placed in a tree. The bones were not disposed of with any ritual. In general, elk were hunted as were deer. To avoid an itch, thought to be caused by eating elk meat, the fat of the animal was rubbed over the body.

The most important game animal of the Western Apache was the deer. Its flesh was the most prized meat, though not always mentioned as the tastiest. The hide and sinews vere used in the manufacture of clothing and containers of all kinds. Supernatural powers were attributed to the deer and considerable ritual was involved in hunting it.

At the present time there are black-tailed (0. hemionus hemionus), white-tailed (0. couesi), and small Mexican deer ( $\underline{0}$. hemionus canus) on the Fort Apache Reservation, the first being the most numerous. ${ }^{74}$ Comparatively few are killed today, as there is only a short hunting season in the autumn. The former hunting songs and ritual are forgotten by the present generation of hunters. Young men may stop at the sight of deer track and blow smoke ritually in the four directions, but they do not know the accompanying songs and prayers.

Formerly adult males spent much of their time

[^33]hunting deer. Hunting was done singly and in groups. If a group of men were involved, they spread out upon reaching the hunting area. Hunters left before sun up, usually on foot. Equipment consisted of weapons, and some yucca string to tie the meat. An ear of corn or a piece of mescal the size of the hand, or both, were carried for food. It was tied to the belt by grass string, not yucca. When the hunters were ready to eat, a fire was built and the corn cob spitted on the end of a stick and roasted. The burned parts were scraped and the corn eaten from the cob or shelled into the hand.

> The hunter would remain in the field for the full day unless successful in his quest. He never remained out overnight. He walked most of the time, with occasional interludes of sitting and resting. When a deer was killed it was hung in a tree until the slayer could return for it, the same day or the next, with a pack horse.

Stalkers preferred to conceal themselves behind grass, as it was believed deer and antelope could see through trees and brush. The disguise consisted of the headskin and antlers of the deer. Occasionally the hide of the deer was also draped over the shoulders. Goddara 75

[^34]states that antler masks in the condition of the season were used. The user of a deer or antelope mask had to be a man with a knowledge of special songs and prayers. Accordino to Goodwin, 76 insanity or some other inis fortune was expected to befall one who, without the power and knowledge of stalking heads, put one on or handled one.

Gifford ${ }^{77}$ indicates that all the Western Apache used deer calls and ${ }^{78}$ that the Northern Tonto lured the doe by imitating, by means of a leaf in the mouth, the cry of a fawn attacked by a coyote.

Informants stated that deer were fomerly run down, in the heat of summer or in the heavy snow of winter, by strong, fleet-footed men. The animals were dispatched with an arrow or club.

Several hunters frequently worked together as a team. In such cases part attempted to drive the deer to the ambushed archers. In the lower and more open country these sometimes concealed themselves behind brush or rock blinds. Gifford ${ }^{79}$ states that the Cibecue

76 Goodwin, Myths and Tales, p. 90 f.n.
77 Gifford, Apache-Pueblo, p. 5.
78 Ibid., p. 81.
79 Ibid., p. 84.
hid in stone-and-brush blinds in the saddle between two hills. At times, while three or four men drove, two archers were stationed on knolls between which ran a deer trail. 80 Archers were also stationed in narrow or box canyons up which deer were driven.

Gifford ${ }^{81}$ states that stick-covered pitfalls were used in narrow trails by the Southern Tonto and the cibecue. The cibecue used a straddilng Dan and a fence hurdle in the front portion of the pit. The Southern Tonto used pits in series; these pits were six to nine feet deep. Informants denied the use of any type of pitfall on snare for deer; two, howover, stated that the Chiricahua had used pitfalls with impaling stakes.

Deer were tracked when there was snow on the ground. At such time two men would circle far to the front, while others followed a straight course. The deer would run from the trackers to the hunters ahead.

Dogs at tiries were used to trail deer and bring them to bay. They were primarily used when the deer had been wounded.

Formerly deer were driven over a cliff in a canyon below Cibecue. In the summer, deer were some-

[^35]times encircled and driven toward waiting archers with the aid of fire. Gifford ${ }^{82}$ reports the surrounding of deer among the Cibecue, White Mountain, and Northern Tonto.

Parties of men went out for several days under the direction of a leader with hunting powers. This man might be a chief or head man, but not necessarily. Special ritual preceded and accompanied these hunts. Youths accompanied such parties as novitiates, doing camp chores as they learned hunting skills and ritual.

Carnivores. The flesh of wolves (Canis occidentais), coyotes (Canis mearnsi), or foxes (Urocyon sp, and Vulpes macrotis neomexicana)was tabled among the White Mountain, but they did eat mountain lions (Felid concolor) and bobcats (Lynx rufus). To what extent the latter animals vire eaten was not learned. The cibecue, on the other hand, could all partake of wolf or coyote flesh, but only a few shamans ate mountain lion or bobcat meat. The use of the skins of carnivores has been described elsewhere.

People once salvaged the carcasses of animals slain by carnivores and brought them home. Among the

[^36]White liountain such meat was eaten only by people who were past the child-bearing age. It was believed that if young people ate it they would become sterile.

The mountain lion was looked upon as a hunting deity. 83 The Western Apache prayed for Iuck to the mountain lion when deer hunting. A White Mountain man stated that the hunter prayed to it because the lion could run swiftly like the deer. The lion itself was killed whenever encountered. Occasionally hunters ambushed the beast at the spot where it had left a carcass.

Bobcats were not hunted but were killed if encountered.

Gifford 84 states that the Northern Tonto and Cibecue prayed to the wolf when deer hunting, while the White mountain did not.

The Cibecue believed that if a coyote barked near the hunting camp it was an omen of good luck. They said, "Hurry, hurry, coyote, let's show up the deer first thing early in the morning and you can use the blood and guts." A heavy rock deadfall baited with a mouse or rat was used for trapping the coyote. This

83 Bourke, Religion, pp. 438-39.
84 Gifford, Apache-Pueblo, p. 8.
was placed in trails not too close to camp, as it was feared young children might be injured by it. Coyotes viere also shot.

Gifford ${ }^{85}$ describes three types of deadfall traps used by the San Cerlos for coyotes. One was a heavily weighted stone or $\log$ deadfell held up by three sticks in unstable equilibrium. Another, used also by other groups and for all carnivores, was made with collapsible $\log$ side walls. Another was a type in which the coyote's neck was broken by a falling stone as the animal grasped the bait.

Bear. Bear (Ursus sp.) were treated by the Western Apache with considerable ritual respect. The animals were feared because they were known to attack and maul humans when suddenly encountered. On winding trails travelers sometimes shouted or sang in order to warn bears of their approach. Contact with the animal was also thought to cause illness. Springs contaminated by bears or around which bear track were found were left unused until all traces were washed away by rains.

Bear were hunted only by religious practitioners with the necessary "bear power." Nost informants

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85 \text { Ibid., p. } 82 .
$$

stated that bear were formerly eaten, though it was evident that not everyone ate bear flesh. It was not determined definitely whether the use of bear meat was restricted to those with supernatural powers, but probably it was not. One old bear hunter had told an informant in the $1890^{\prime}$ 's that his crippled, clenched and stiffened fingers, resembling a bear-like claw, were the result of eating bear in his youth.

Bear were saia to have been brown and black varieties. One old man, who apparently was not given to understatement in his Jarns, claimed in the last century to have seen a white bear in the White Mountains, possibly an albino.

A White Mountain informant with "bear powers" stated that as bears were dangerous they were hunted by a group of four or five men, either on foot or horseback. The hunters had to be medicine men. Gifford 86 states of the Northern Ionto that bear were killed with a single arrow if the hunter knew the medicine for killing; another hunter without such powers might use a hundred arrows without mortal effect. Bear were shot with the bow and might be dispatched with the spear if necessary.

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86 \text { Ibid., p. } 88 .
$$

When hibernating bears were hunted, one man was stationed in front of the den, others took positions on either side, and another, if possible, would stand above the den. The bear would be aroused by poking it on the nose with a stick. As the beast emerged, it was shot or speared in the heart.

A White Mountain hunter denied that the dens of hibernating bear were entered. However, a Cibecue informant had been told that hunters went into the den with a spear, and one old hunter had even claimed to have dragged a bear from its lair by the paw. A Cibecue informant who had himself hunted bear stated that people feared to attack bear with arrows, as the wounded beasts were dangerous, but that they would hunt them with a flintlock gun, shooting for the chest, not the head.

The White Mountain referred to a bear as "grandfather" (mother's father) and if one was encountered by chance it was told to "go away, grandpa." However, informants stated that when hunting, no words were said to the bear either before or after it was killed. Gifford ${ }^{87}$ states that the Southern Tonto, Cibecue, and White Mountain addressed the live bear and that the

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87 \text { Ibid., p. } 9 .
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Northern Tonto addressed the dead bear. His inquiries were limited to those groups and the Northern Ionto were the only group asked about addressing the dead bear. According to Gifford, 88 the Cibecue hunter said, "I am going to shoot you. I want you to die with the first arrow." Bourke 89 states that the Apache prefixed the respectful term "old man" to the word for bear. The Mescalero use circumlocutory phrases for the bear, believing that use of the regular word would cause the animal to appear and communicate a painful disease. 90 There viere ritual songs and prayers used for hunting bear among the White Nountain. A set of curing songs addressed to the bear was used for those who were constipated. The old man who knew this rite would not sing them, as he believed that if they were sung when no one was 111 it would bring bad luck to the well -that perhaps some of his children would become constipated.

Bourke ${ }^{91}$ states that the killing of a bear was the occasion for a war dance, in which the pelt was carried around a circle, first on the shoulders of the

88 Ibid., p. 88.
89 Bourke, Religion, p. 440.
90 Hoijer, Chiricahua and Mescalero, p. 217.
91 Bourke, Loc. cit.
slayer, then on those of other warriors. Elsewhere 92 he notes that much pollen, usually tule pollen, was thrown on these occasions, and that the dancing was frenzied. One such dance which he observed in the Sierra Madre in 1883 lasted all night with no cessation in singing and dancing.

Bear flesh was boiled alone or with pit-baked corn.

Small Game. Small game, cottontail rabbits (Lepus sylvaticus), jackrabbits (Lepus sp.), prairie dogs (Cynomys Iudovicianus), wood rats (Neotoma sp.), field mice (Microtus sp.), ground squirrels (Citellus sp.), and tree squirrels (Sciurus sp.) were hunted by boys. While men killed such game on chance encounter, they did not usually hunt it systematically except for occasional rabbit drives.

The jackrabbit was not considered choice meat because it was tough, but the cottontail was esteemed. Bourke 93 states that tule pollen was offered to the jackrabbit. Rabbits were run down by swift youths, especially when a heavy snow covered the ground. Dogs

92 Bourke, Medicine Mien, p. 505.
93 Loc. cit.
occasionally were used to mun them down. When rabbits hid in their burrows or in hollow logs they were pulled out with a wetted, notched stick twisted in the fur, or smoked out. Gifford ${ }^{94}$ reports that the San Carlos plugged rabbit burrovis a short distance from the opening and extracted the animals by hand when they sought refuge therein. Occasionally in a field, rabbits vere flooded out, as were rats and gophers. Deadfall traps were used for pabbits as for other small to medium-sized game, but there were no snares.

In stalking rabbits boys often worked in pairs, one behind the other. The first boy would continue straight ahead and therby hold the attention of the rabbit, while the second approached within shooting distance of the animal. Rabbits were killed with bow and arrow and, by the White Mountain, sometimes with the sling. Throving sticks were not used. Clubs (not throwing clubs) were used only when game was run dovn or encircled. Gifford ${ }^{95}$ refers to game calls used for rabbits by all Western Apache except the San Carlos.

Rabbits were sometimes hunted by large parties of males of all ages, who surrounded an area and closed

[^37]in or spread out and beat through an area. In summer on suitable terrain fire was used as an aid, a large segment of a circle being fired while a line of men closed off the unfired gap. Rabbits were killed with arrows or with yucca stalk clubs about six feet long. One informant stated that a fire circle might be as large as a mile in diameter; another had seen brushy level areas one-half by one-quarter of a mile in size fired. Women did not participate in rabbit drives. Gifford ${ }^{96}$ reports rabbit hunt masters appointed by the Northern and Southern Tonto; for the Southern Tonto these were temporary.

Gophers and ground squirrels were not eaten except in times of scarcity. Squirrels were shot from trees, where they were sometimes treed by dogs. The author saw one killed with rocks by a boy of fifteen whose dog treed the creature. Some groups are reported by Gifford ${ }^{97}$ to smoke squirrels out. Prairie dogs were eaten but were reputed to be "all fat, no meat."

Of all small rodents, the wood rat was considered the greatest delicacy. Rats were trapped with rock deadfalls; flooded, smoked out of their nests; and oc-

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& 96 \text { Ibid., p. } 84 . \\
& 97 \text { Ibid., pp. } 82-83
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casionally pulled out of holes with wetted, notched sticks, or dug out. One case of the use of a hooked stick was reported. An informant stated that brush nests were surrounded, while one boy or man removed the sticks on the nest until the rats ran out. They were then stepped on, stoned, clubbed, or shot with arrows. Bourke 98 observes that where rats had burrowed under mesquite or other brush and made several entrances to their nests, one boy would lay the curved end of a "rat-stick" across the mouth of one hole. Others would poke sticks into the other entrances. When a rat peered out of the one unobstructed hole, the rat-stick was pulled toward the holder, breaking the rat's back. Davis ${ }^{99}$ describes the firing of a brush-pile nest. The surrounding Indians killed the rats as they ran out with long, limber sticks.

Rats were prepared in several ways. They were roasted on hot coals and ashes. Soups were made from them. Boiled rats were mashed, except for the heads, teeth, and vertebrae. Sometimes they were placed in the fire whole and singed. Then the hair and hide were scraped with a stick, the body broken open with the

98 Bourke, on the Border, pp. 129-30.
99 Davis, Truth about Geronimo, pp. 64-65.
hand, and the entrails removed with the fingers or shaken out. Iiver, heart, brains, tail, "everything" was eaten except the intestines.

The White Mountain encouraged boys to hunt by telling them that the boy who brought in the most rats would get a wife. "One who filled a long pole with rats would get one, while lazy boys would not."

A story of the development of Apache culture is recorded by Goddard, 100 in which the condition of the people was depicted as originally so poor that they obtained food by setting fire to the nests of field mice at the base of sotol stalks and eating the singed mice that were left; only later did they learn of wood rats, rabbits, and deer.

Porcupine (Erethizon epixanthum couesi) Plesh was highly esteemed. The quills were removed with a stick tweezer, in modern times with tin tweezers. Goddard 101 recounts a tale in which a porcupine was pulled from its burrow with a stick twisted into its quills, then pit baked.

Beaver (Castor canadensis) meat was said by one informant to be the best he had ever tasted. The

100 Goddard, San Carlos Myths, pp. 47-49.
101 Ibid., p. 65.
animals were shot or taken with deadfalls. Raccoons (Procyon lotor) were also eaten. Mink (Lutreola vison) were not eaten. Skunks (Mephitis and other genera?) were said by the White Mountain and Cibecue not to be eaten. Gifford, ${ }^{102}$ however, states that the Southern Tonto ate skunks.

Information on eating badgers (Taxidea taxus) was contradictory, but old Cibecue and White Mountain informants stated that they were once eaten and even considered good. They were shot, clubbed, and trapped. At times they were dug out with digging sticks.

Today the White Mountain and Cibecue Apache do not eat or hunt the wild pig (Tayassu tajacu), though these are numerous in parts of their reservation. As the animal is known to attack humans it is feared. About five years ago a wild pig was killed by a boy who encountered it by chance. He sold it at a cibecue trading post. Observers of the seventies and later reported the Apache detested pork and were only with difficulty educated to the idea of eating issue bacon. ${ }^{103}$ Bacon, ham, and occasionally fresh pork is now purchased

102 Gifford, Apache-Pueblo, p. 90.
103 Bourke, Apache Campaign, pp. 30-32; Palmer, Customs, pp. 167-68.
by the Apache from the reservation stores. One informant told of being sent out to hunt during the seventies when meat was needed, and retuming with a wild pig, which was received with pleasure by his aunt.

Birds (and Eggs). Turkey, quail, pigeon, and dove were hunted and eaten by 211 the Western Apache. Water fowl were also eaten, though perhaps not all species. The White vountain stated that geese and ducks were eaten while two Canyon Creek informants stated that geese were eaten but not ducks. Ducks were said by one of these two men to be shot for their feathers, but not to be eaten even when people were hungry. Hunting on the water with the aid of gourd head masks, as described by Cremony ${ }^{104}$ for the Warm Springs Chiricahua about 1850, was denied. Although the White Mountain ate ducks, they were avoided by pregnant women. It was thought that if ducks were eaten the child would be born with webbed feet.

Eagles, hawks, turkey buzzards, cranes, crows, and owls were not eaten, nor were their eggs used. The blue jay (Cyanocitta sp.) was not eaten because it was thought to give warning of approaching enemies. Other 104 Cremony, Life Among the Apache, pp. 27-28.
birds than those named were eaten, but these were not identified. Birds' eggs, except those of the tabued species listed above, wero caten when found.

In 1879 turkey (Meleagris gallopano) in the vicinity of the Black River were reported ${ }^{105}$ to be "so numerous they seemed to cover a five acre lot." The birds weighed up to twenty-five pounds.

Turkeys were hunted during the day and also at night. In the daytime a "gobbler tail" was sometimes held as a mask before the hunter's face. This was said to attract pugnacious turkey gobblers. The favored hunting technique for turkeys was to locate a roosting place and return at night to kill the birds. On moonlight nights, especially when the ground was snowcovered, they were shot from the tree with arrows. At other times they were shot immediately after sunset, While there was still light enough to see. Others, but not all, among the Cibecue and White Nountain (and Northern Tonto and San Carlos also, according to Gifford ${ }^{106}$ ) hunted turkeys by the light of grass torches. Toward the desert the white luountain at times built fires under the roosts. The smoke was said to

105 Cruse, Apache Days, p. 45.
106 Gifford, Apache-Pueblo, p. 6.
blind and stupefy them and they would not fly away. Boys and girls went out together on such night hunts, the girls building the fires while the boys shot the birds. Sometimes a pole might be leaned against a tree before the birds went to roost. That night the hunter would return, climb into the tree, and attempt to kill turkeys with a stick, or to grab them by the legs or neck.

Dove and quail (Lophortyx gambeli?) were also hunted at night, with or without the aid of flares, and among the White Nountain, by building fires under the roosts. A very few hunters used dogs to flush quail in order that they would take refuge in trees. Gifford ${ }^{107}$ states that the San Carlos ran down quail when they were wet. Goodwin ${ }^{108}$ mentions occasional quail drives in which the young and old of both sexes joined.

The Gibecue hunted dove and other birds from blinds. A tree near a spring was chosen or an old dry tree was erected. Around these brush was piled after the manner of a wickiup. The hunters hid in these. As the birds lit in the tree the hunter shot them. An informant's father had helped him build such blinds when

107 Ibid., p. 5.
108 Goodwin, Western Apache, p. 475.
he was a boy, and a number of boys together often put up several such blinds.

Turkeys and quail were sometimes run down. 109
Frequently they were killed by accurately thrown stones. 110 Traps were sometimes used for quail. Three of these are diagrammed below. (Fig. 3.)

When eggs were found they were eaten even if partially incubated. They were boiled or roasted in hot ashes, never eaten raw. Gifford ${ }^{1 l l}$ reports that Northern Tonto and cibecue children did not eat quail eggs lest they have freckles; among the Cibecue this tabu was attributed to the greed of the elders.

Feathers from many species of birds were used for fletching arrows, ornamenting caps, or for ceremonial purposes. Tumkey feathers were easily procured and were perhaps most used for arrovis and caps. Fagle (Aquila sp.) and hawk feathers were used ceremonially and were usually handled, at least initially, by men with "eagle pover."

A White Mountain informant stated that eagle feathers were desired for "holy" things. The birds were

109 Bourke, Apache Campaign, p. 28.
110 Bourke, Vesper Hours, p. 59.
111 Gifford, Apache-Puéblo, pp. 10 and 90.

killed by anyone, but only members of clans related to the eagle could safely pluck the feathers. The plucker was obliged to leave some feathers on the bird. When pulling the feathers, the plucker faced to the west, then threw the first feather over his back toward the east. The next three feathers were thrown successiveIy to the south, west, and north. Thereafter the feathers were thrown first to one side, then to the other, but none to the front. When the plucking was completed, except for the feathers to be left on the bird, the Eagle Clan member tumed his back whlle the owner of the eagle picked up the feathers. Then the body of the eagle was placed on the top of a tree. Feathers of poisoned eagles were not used.

A hunter who acquired eagle feathers was expected to share them. Before anyone could use them or wear them they were "fixed" by a medicine man, one with eagle power. Thereafter they were used in various "secret" dances, worn in pairs on caps, or worn around the neck or under the shirt. Nen may still be seen on the Fort Apache Reservation with a downy feather protruding from the shirt and a cap decorated with eagle feathers was wom by an old man at a social dance in 1947. During the girls' puberty rite, a down feather was worn on the "debutante's" forehead; other feathers
were suspended from the staff used in the ceremony. Feathers were used in applying pollen to her face, and in the final morning ceremony she was drawn to the east by her male sponsor, who held an eagle feather vith each hand for her to grasp. Eagle foathers were suspended from the four-pole open lodge in which the morning ceromony was conducted, and from the elbows and wrists of the gan (mountain spirit) dancers who perform during the preceding nights. It was of interest that stones, blue (turquoise) for men and white (erystal) for women, the most efficacious of which were obtained from Pueblo ruins, could be used or worn in the same way as eagle feathers.

Reptiles, Fish, and Insects. With one exception, the Apache denied that they had ever eaten snakes or lizards. A Canyon Creek informant stated that the Eonto formerly ate a large lizard (probably the chuckwalla; Sauromalus obesus), but that no other Western Apache ate it; he did not know whether the Chiricahua or other surrounding Indians ate it.

Until recently the Apache were afraid to kill snakes, but now attempt to kill rattlesnakes Crotalus sp.). Snakes other than rattlesnakes were never molested. In the days when poisonous snakes were un-
harmed, a gray rattlesnake with black spots "the same color as the earth" bit many San Carlos Indians Iiving in the Salt River valley.

When snakes were killed, accidentally or otherwise, they were buried. This was done to prevent contact with snake blood or a dead snake. If such oceurred it was believed that the unfortunate person would become crippled.

It is also believed by the Apache that contact with lizard blood was dangerous. Persons stepping on a lizard were thought to get sore feet, rheumatism, or "black poison and cracked body." cibecue boys used to kill Iizards with rocks or sticks. A White Mountain informant stated that if one killed a lizard, bad luck followed unless something were given the creature to cover its body. A rag or a handkerchief would be placed over it with the words, "This is for you."

Ritual also followed the killing of a spider or scorpion by a White Mountain. On such occasions it was necessary to say, "Go bite my cousin (name of cousin)." Any paternal or cross cousin would do. No likes or dislikes were involved in the choice of cousin named.

The Western Apache did not use fish until after contact with the Anglo-Americans modified the prejudice against such food. Even today only the younger men fish
or make use of fish for food. Older people and women were said not to like them.

With one exception, informants denied the use of insects as food. A Canyon Creek man stated that a green worm seven inches long with a "horn on its tail" was gathered from the ground and "boiled with spinach." When dead the dried insect was also rolled up in the hands and smoked in cigarettes. The surviving Oatrnan girl, a captive of the rontos, stated that her captors ate worms, grasshoppers, reptiles, and all flesh. 112

As late as twenty years ago the White Mountain children chased "big black bees" with a fan formed from yucca leaves. When knocked down, the stinger was removed from the insect and the "sweet stuff" sucked out. This was said to be very good.

In 1948 small boys of the age of six or seven were observed shooting grasshoppers and other insects with cactus-spine darts fired from spring guns.

Butchering. Skinning and butchering of animals was considered to be men's work, while the care and preparation of meat and skins was the work of the women. 113

112 Stratton, Captivity, p. 98.
113 Goodwin, Western Apache, pp. 332-33; Myths and Tales, p. 163 f.n.

Large animals were usually skinned and butchered where killed for greater ease and convenience in transporting home. However, the whole carcass was sometimes carried home before butchering. Gifford 114 reports this as the usual Northern Ionto method.

The White Mountain preferred to skin deer on scrub-oak branches. If these were not available, grass and leaves were put under the animal. Juniper branches were not used because they made the meat bitter and pinon branches were said to give it an unpleasant odor. The animal was never skinned on the ground or hanging. The usual skinning procedure was to make an incision on the ventral side of the animal from chin to tail. Other incisions were made up the inside of the legs and around the legs just above the feet. The pelt, when removed, included the face and ears and tail. occasionally a small animal was skinned by cutting off the head and casing the hide. Gifford 115 reports that some San Carlos quivers were made of the cased skin of the coyote. The ritual of skinning required that the hide be laid four times in one direction by the Northern Tonto, one time by the San Carlos, Cibecue, and White

> 114 Gifford, Apache-Pueblo, p. 9. 115 Ibid:, p. 121.

Mountain. 116
The entrails of a deer were wrapped in the hide and carried home. These were considered the best parts of the animal, the cleaned intestines being a particular delicacy. Unwanted parts were not scattered, but were carefully piled on top of a near-by bush. Deer blood was preserved when possible and transported in the aniinal's stomach. Heat other than the entrails was wrapped into bundles and tied with yucca. Yucca cord was carried by hunters for this purpose. The udders of does with young were saved and the milk preserved, if possible.

At camp the meat was pounded and squeezed to extract the blood. Blood so squeezed, with that salvaged at the kill, was cooked about half a day in the stomach or boiled with fat, commeal, and wild onions. this "blood sausage" was said to be "stiff, just like ginger bread" and was sliced "Iike a chocolate cake." Doe udders and milk were cooked over coals. The milk was reputed to taste like cottage cheese.

An old Cibecue hunter, now dead, claimed that looking through the stomach fat of a deer caused trachoma. This belief was not known to White Mountain

[^38]informants. The feet were cut from the animal by the White Mountain as soon as they arrived home and thrown in any direction, as it was feared children would find and play with them, thereby incurring bad luck.

During the period when elk were still hunted the Cibecue cut out and threw away a gland under the tail. This was reputed to impart an odor to the meat if not quickly removed. It was thrown in the direction the wind was blowing.

Among the White Mountain when turkey were killed, the "red bag" under the neck was never cut or opened, but thrown away, lest a snake be found inside.

Skins. Skins were dressed both by men and women. 117 Women, however, more commonly cared for them. 118 Goodwin 119 describes the dressing of deer hide. The hide was first soaked in a grass-lined water-filled hole. The next day the hair was removed. Then the hide was placed over a post and scraped to remove all particles of fat or meat. Fleshers were made from the cannon bone of a deer. After this the hide was placed in the

[^39]hole and soaked, then removed and wrung dry. This was repeated several times. Deer brains were boiled in a pot and rubbed into the hide with dry veeds. The hide was then soaked again, this time in a basket. The process was completed by working the hide with the hands until it was soft. Goodwin 120 recounts a tale in which a woman made hoops of saplings on which to stretch hides. Hides to be used for blankets vere not dehaired.

Tools used in preparing hides in addition to the cannon bone flesher were oval flint blades for skinning (the same tool described as used in trimming mescal leaves) and sharp rib bone scrapers for de-hairing. A White Mountain woman stated that while dressing buckskin the worker may not drink liquids; violation of this tabu was thought to be followed by a hardening and drying of the skin.

Bear skins were difficult to dress. The "bear grease" was first rubbed off with a stone tool. Ashes were put on the inside and charcoal rubbed in with the hands. The skin was then pounded and scraped with stone tools. The scraping might consume two days, as the hide did not soften readily. Sometimes it was rubbed

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120 \text { Ibid., p. } 41 .
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with deer brains to aid the softening process. After the pounding and scraping process, the hide was stretched in the sun and pinned down with about fifty wooden pegs. When it dried it was removed and buried in damp earth. Then the hide was worked with the hands until it became soft. The hair was not removed. Hair was never removed from any hide except deer and occasionally elk.

The Apache considered buckskin the most valuable hide. Prom it they made all articles of clothing and footwear, blankets, carrying and storage bags, and other minor articles. Buckskins were a standard article of trade.

The thick skin from the sides of a deer's jaws was used for the soles of moccasins, skin from the middle of a deer's legs for the uppers. Sinev whas used for sewing. 121 Buckskin caps were made and ornamented with turkey, hawk, and eagle feathers. Large sleeved shirts and trousers were also made of this material. The trousers at least were a fairly recent article; pre-reservation dress for men consisted of moccasins, hip-length leggings, and breech clout.

A deerskin bag was made with an opening at one end. This was about eighteen by eighteen inches in

[^40]size and was flat when empty, round when full. The sides and bottom were sewn with sinev. A carrying strap of skin one inch wide was added. There was no ornamentation. This bag was carried by men across one shoulder and under the opposite arm or around the neck with a hand clutch. Women supported the carrying strap across the forehead. This bag was said to be ancient. It was used in the same manner and for some of the same purposes as the burden basket. Another type of buckskin bag had a cross slit opening in the center of one side, the load being distributed at the ends; this was similar to the present Apache saddlebag.

A White wountain informant stated that waterbags were occasionally made from deerhide. These were used on trips. A carrying strap was attached. They were not used in the pernanent camps. It was necessary to soak them overnight before using. A Canyon Creek man stated that, while water bags might be made of the paunch of a deer, the hide was never so used.

Buckskin had a variety of minor uses. Flour was stored in cased fawn skins. Buckskin thongs were used to wrap the bow, to secure the tops of the burden baskets, and to bind women's hair at the back of the head. For the last purpose a buckskin square was ornamented with painted pink or yellow dots or with brass nobs.

The hair below the binding hung loose.
Whole deer hides vere used as blankets, usually with the hair on, and at times as weatherproofing on the outside of the wickiup.

The hides of unwounded animals were used for ceremonial purposes. Animals viere run down, not shot. Such unblemished hides were given, with turquoise and downy eagle feathers tied to the forehead, to religious practitioners as a ceremonial gift. 122 Bourke, 123 who had seen attempts to capture a fawn alive, believes that buckskin for sacred purposes must be, whenever possible, that of a strangled animal. The Southern Tonto practice of surrounding young antelopes, catching them by hand, and killing them by pressing the foot over the heart, as described by Gifford, 124 suggests a possible ceremonial use for these hides also. A White Mountain woman stated that the skin of a deer fetus stuffed with grass was carried over the shoulders of the clown dancer. The clow may also dance with fir branches over the shoulders if such a skin be unavailable. This informant had been attempting to purchase a fetus hide

122 Goodwin, Myths and Tales, p. 115.
123 Bourke, Medicine Men, p. 580.
124 Gifford, Apache-Pueblo, p. 84.
for use in her daughter's puberty ceremony and had bid first five dollars, then ten for one, but the owner had refused to sell.

Elk hide was used principally for beds, blankets, moccasins (including the whole feet and leggings), and pack sacks. It also was tied on the exterior of the wickiup to break the wind. Elk hide was said to be good for nothing except the above-mentioned uses. Occasionally the hair was removed from elk skins in the dressing process, as it was "too coarse -- too thick."

A White llountain myth, "The Man Who Pursued Mountain Sheep," was said by Goodvin ${ }^{125}$ to account for the fact that one must never pursue a mountain sheep and never make a "buckskin" of its hide, but restrict one's self to killing and eating the animal. A Canyon Creek informant stated that mountain sheep siin was used for clouts, a two foot strip being passed between the legs and under a belt, front and back. The skin was considered good for nothing else, as it was "too thin -just like calico."

Buffalo skins were an expensive import well liked for robes and blankets. Two were sewed together to make a blanket.

125 Goodwin, Ibid., pp. 130-31.
















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Bobcat skins were made into blankets if enough could be obtained, or fashioned into small sacks, an everyday cap, or used like a scarf to wind around the neck.

Badger skins were used in making blankets, shirts, and caps. In the latter, parts were left hanging dow the cheeks.

Fox skins were made into caps with cheek flaps. Goodwin 128 reports that the white Mountain chief Diablo hunted gray foxes for blanket skins.

Skunk skins were made into blankets, shirts, caps, and moccasins. The tail was used for a head band.

The tails of raccoons and other tails were left hanging from caps or detached and wrapped about the neck.

Beaver skin was considered good material for sacks or clothing or "anything." It also was made into a. cap with the tail left hanging at the back of the head.

Squirrel skins were sewn together to produce blankets. The tails were left "sticking out." Blankets were also made from rat and gopher hides. Skins

[^41]of different animals might be used together in the same blanket. When using the blanket, it was spread flat if shared by more than one individual; othervise an Apache rolled-up in it.

Rabbit skins had various minor uses. They were used for baby blankets. In winter, they were wrapped around the feet inside the moccasins, the skin side next to the foot, fur side out. Occasionally they were made into caps. Their principal use, however, was for small sacks. Such a bag was fashioned by cutting off the head of the rabbit and casing the skin. This skin was rubbed with grease, reversed, and a strip of buckskin added for a handze. It was not ornamented. It was held in the hand or attached to a belt at the hip, and was used for tobacco, corn, or small personal items. No blankets were made of rabbit skins.

Meat Recipes. The choicest part of the venison was broiled over the fire or hot coals. Usually the select portions were cooked rare, though some preferred their meat well done. Neat was cooked by placing it directly upon hot coals, on a flat rock over the coals, or by spitting it on a stick. Other parts of venison were boiled, alone or with "pepper" leaf. Heat was not boiled solely for the purpose of softening tough cuts,






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for the Apache were very fond of boiled meat and of meat soups.

The favorite recipe consisted of boiled, macerated venison into which acorn meal had been pounded. A gruel was made of meat, soup stock, and acorn meal. "Butter soup" was a term applied to this dish by the whites because of its yellowish color.

Venison was boiled with corn and beans, also at times with wheat.

The recipes mentioned apply also to the meat of other animals than deer.

Pit-baking was a favored method for cooking some cuts of meat, some kinds of animals, and any meat while on the hunt or paid. Deer heads were wrapped in bear grass (in modern times in a wet gunnysack) and cooked overnight. Porcupine was invariably cooked whole in this way after first burning off the quills, Gifford ${ }^{129}$ states that the Northern Tonto cooked wildcat meat, and the Southern Tonto cooked coyote, wolf, wildcat, and horse and cow heads in this manner. For pit baking meat a hole no larger than necessary was scooped out, a fire built, and a small rock placed on the fire. The animal or bird to be baked was placed, usually with the

129 Gifford, Apache-Pueblo, p. 98.
hide or feathers on, upon the rock, then quickly covered with wet or green grass and earth. Whe Northern Tonto, according to Gifford, 130 covered their wildcat meat with pine needles and earth.

Entrails were, and still are, the first part of the meat eaten. Reagan ${ }^{131}$ states that beef intestines were washed inside and out and brolled over the fire, while the stomachs of edible animals were washed and cut into sections for broiling. Reagan states that formerly the intestines were eaten raw, without cleansing. This was denied by informants. Bloom 132 recounts a scene on the Gila in which Apache were purported to have roasted the entrails of a dead horse, containing all the filth, in ashes, then eating pieces with the "seasoning" funning dovm their faces.

Blood saved or pounded out of an animal's flesh was made into sausage. It was encased in the animal's stomach or intestines. Such blood, mixed with salt and fat, was either boiled or roasted over the fire.

Vertebrae and other bones were kept to make soup. If not used immediately, they were cut or broken and

130 Ioc. cit.
131 Reagan, Notes, p. 292.
132 Bloom, From Lewisburg to California, p. 169.
dried. Such stored bones were placed in saddle bags by the wickiup or in a tree, and would keep all winter. Gifford ${ }^{133}$ reports that the Cibecue, after first extracting the marrow, boiled bones four or five times for soup, and that they also pounded vertebrae and other bones with mescal juice and ate them without further cooking.

Bourke ${ }^{134}$ notes that the Apache scouts spitted heads, hearts, and livers of game and broiled them before the fire.

Live turtles were placed upon hot coals and roasted, after which they were portioned out to all in the camp to eat as "medicine."

Turkeys were roasted or boiled. A Cibecue informant stated that the feathers were always removed before cooking and sometimes the skin. The intestines were removed and the gall bladder thrown away; the rest of the fowl vas eaten. Other birds were cooked in the same manner or were pit baked.

According to Goodwin, 135 rats were placed in the fire and the hair singed off, then skinned and either

133 Gifford, Apache-Pueblo, p. 99.
134 Bourke, Apache Campaign, pp. 27-28.
135 Goodwin, Experiences, I, p. 35.
roasted or boiled. Santee 136 states that woodrats were strung together on a string and lowered into a can of boiling water without skinning or cleaning.

Neat was cut in strips, sun dried, pounded, and stored for future use.

A Mexican-type tamale of corn with deer or horse meat was bolled in corn husks.

Meat was compressed in the hand to form balls, one being made simultaneously with each hand. The use of one hand only was tabued, though the informant did not know why. These were bolled.

According to Palmer, ${ }^{137}$ green vegetables were never cooked with meat.

Chili was occasionally brought from Mexico. It was sprinkled over meat which had been broiled, and was also eaten with corn mush and beef jerky.

Since the introduction of frying pans meat is frequently fried. It is now often fried or boiled with potatoes.

Storage. Venison was stored by hanging in or placing on ramada-type platforms. One instance of a

136 Santee, Apache Land, pp. 11-12.
137 Palmer, Customs, pp. 169-70.
tree platform was reported. Meat tied between pieces of cedar bark for protection from moisture or tied in a tree was said to keep for three to four months. Meat was cached in this way when a family left its permanent home. Cround cachos vere not used for storing meat. Pemmican was made as follows. After being cut into thin strips about one foot long, meat was dried two days upon a shrub. It was then pounded on a flat rock with a cylindrical hammer stone. The pounded meat was put loosely in a deerskin sack or a carrying basket and covered with anything available. If hung in a cool place in the wickiup, it would keep for about a year. Meat was never packed with grease or berries.

Division and Trade. Among the Apache, generosity was an ideal. Successful hunters were expected to share their kill. All neighbors might be included in a division of meat; however, the, "poor" (meaning, in this case, those in need, or families without adult men to provide for them) were especially favored. There were also conventions under which others might share part of a. hunter's kill. A nunter's relatives by marriage had strong claims upon his game.

A11 informants insisted that in pre-reservation times everyone shared a kill or catch. The Apaches
were taught to divide and vere never selfish. If poople dia not stop a hunter as he carried his carcass home, the hunter would later cut it up and take portions to thom. He might give away all the meat at once, or wait and give some every day until it was consumed. Frequent contrast was made between this ideal condition of old and the ungenerous individualism of the present time. Incidents mere roported which shomed some deviations from the ideal of a division of meat. Though some people ("big men," "chiefs," "good men") always shared their meat with others, there were some "poor" people who rould attempt to hide food. Such men would conceal their venison by hiding it in a tree and go out at night to bring it in for their children. "Ioo many people tried to hide."

A recent hunting episode will illustrate the differing attitudes of the ideally generous Apache and the deviant. Mwo men went hunting together, one kil11ng five deer and the other, four. The more successful hunter hid two of his deer and brought in only three, While the other brought in all four of his. The kill was divided equally between the two hunters and the meat was later apportioned to relatives and friends. When the killer of four deer later heard that his hunting partner had hidden and kept for his individual use
two-fifths of his kill, he stated he was so angry that he would like to kill him. An old informant, survivor of pre-American days, stated that some people had always behaved in such a selfish manner.

Among the white lountain a skillful hunter was frequently followed at a distance by thosewho were less adept or energetic. Though such men knev they were being followed, they seem to have made no effort to elude their trackers or throw them off the trail. The followers approached if the hunter was successful and the kill was divided. In such a case the slayer had several options. He could tell them he was going to keep the hide and allow others to help him with the skinning; or he could tell one individual to skin the carcass, and this man would then recelve only the skin and head of the animal, no meat.

Goodwin ${ }^{138}$ states it was the custom for a companion, not the killer, to claim a deer. An anecdote In which a deer was claimed by others than the killer and the hide slashed so as to be unusable indicates that hunters did not invariably accede with good humor to other's claims. Giffor ${ }^{139}$ notes that among the

138 Goodwin, Experiences, I, pp. 67-68 and f.n.
139 Gifford, Apache-Pueb10, p. 9.

Northern Tonto and Cibecue a killer's companions obtained the hide. Gifford's information on the other groups on this point was apparentiy inconclusive. It would appear that whoever obtained the hide received also the head and brains and perhaps the spinal cord. According to Gifford 140 a Southern Tonto hunter divided all the meat he killed among his companions; only if another made a kill would he receive any meat.

Some chiefs among both Cibecue and White wountain sent out hunting parties. Although a portion of the meat would usually be given the chief and he would be glad to have it, it was stated that "he would not care" if he received none, as the hunters were sent primarily to procure food for their own families. In a local group at Cedar Creek a division of the kill of such hunting parties was made by a man temporarily appointed for that purpose. This would not be the chief and would not be the same man in every case. Of those who exercised this function "some were good men; some bad -- not to be trusted." The most. important item in the division was the skin.

Relatives by marriage received special consideration from a hunter in the distribution of his game.

140 Ibid., p. 89.

Even while courting, a hunter often brought small game as a gift to his sweetheart. 141 According to Goodwin, 142 a. man was expected to hunt and to share the kill with his in-laws; thus, a man might hunt deer especially for a new sister-in-law (brother's wife). A man's wife's sisters helped themselves to the meat which he killed. Game, when killed, was expected to be divided also vith the wife's brothers, and they might even help themselves to it without asking. 143

The small game hunted by boys was divided equalIy among the participants after a hunt. 144 . When boys accompanied adults on a hunting party, they received some of the less choice portions of the kill when the meat was divided. 145

A hunting partnership was sometimes formed with crows by a hunter who would say, "All right, I go to hunt deer now. I will let you have the guts. The deer is right close now. Where is he? You take me over there and I'Il let you have the viscera." The erow was

141 Goodwin, Myths and Tales, $p .94$ and f.n.
142 Ibid., pp. 76, 97, et passim.
143 Goodwin, Western Apache, p. 264.
144 Goodwin, Experiences, I, p. 35.
145 Goodwin, Western Apache, p. 475.
reputed to fly over to the deer. There the hunter would leave the unwanted portion of the carcass (little enough) for the crow and hide the meat in a tree, but the crow would "steal" part of the meat, nevertheless. Heat was occasionally exchanged for com, but there were no professional hunters. Buckskins were occasionally traded to the Ionto, Navajo, and Pueblo. A wide distribution of certain types of kills was expected. Thus, as mentioned in the section on boys' training, a jouth's first kill was divided among all the camps in a group. The White Mountain divided turtles among all families, as the meat was considered a "medicine" for whooping cough and other ailments. A successful eagle hunter was expected to share the feathers.

## Miscellaneous Ritual Associated With Hunting.

 There were standardized acts of hunting ritual, including prayers and song, which every man could learn. In addition there were extra hunting powers, usually exercised through prayer and song, which were acquired through contact with the supernaturals or, as proprietary rites, were acquired from the holder. Those with proprietary rites usually taught them to a relative, though others, for a fee, might arrange to learn them.Those with extra hunting powers were often sought to lead hunting parties, and hunting skill and powers added considerably to a man's prestige.

The Cibecue offered prayers to the Sun or to the gods, and made an offering of yellow pollen before deer hunts. They also used colored stones and effigies from Pueblo ruins, though exactly how was not learned.

It was believed that if an ovil hooted near the camp, many deer would appear in the morning. If a fox barked near camp, someone would sicken and die. Roadrunners which walked around and around the camp in the daytime and did not frighten betokened a death in the family of the hunter.

Strict tabus were observed on the hunt by the Cibecue. There was no joking, no talking of meat, no unnecessary conversation of any kind. In boiling meat the cook was careful not to expose it to view, but stirred it quickly. Neat was never thrown, to a dog for instance, but handed sIowIy. Neat was not thrown away. Any unwanted entrails vere piled carefully on top of brush. The Mescalero also thought it unlucky, apparently at all times, to throw food about or to handle it carelessly. Even bones were placed in a neat pile and disposed of at once, not thrown around. To do othervise was thought to risk the loss of hunting skill
and cause a shortage of food. 146 Hunters formerly could not take utensils along, or any meat for food. Today, however, these precautions are not followed. The Cibecue sweated in the sweat house and sang hunting songs both before and after the hunt. Hunters looked at the Sun and prayed, and the Sun shoved them where the deer were. At other times they prayed to a large, bright star at an engle of about 30 degrees above the horizon, probably the Morning Star.

The larger overnight hunting parties sang deer songs at night, at which time the hunters placed their guns against a tree. The medicine man in charge would sometimes predict that they would be lucky. At other times he would say, "Somebody has talked way back home; somebody has talked behind you; you will not see your deer." Both Cibecue and White Mountain believed the hunter would have no luck if his female pelatives or people back at camp talked about his quest. A wife, queried as to the whereabouts of her husband, would not answer that he vas hunting but, with a wave of the hand, sa, "over there." In the morning a medicine man might say that he had dreamed of blood on his hands or that his feet were bloody and continue, "I think that's

146 Hoijer, Chiricahua and Mescalero, p. 217.
lucky; how did you fellows dream?"
The White Mountain deer hunter prayed to the gan (mountain spirits) for good hunting and also to the deer and to the mountain lion because it could run swiftly like the deer. Women prayed to the goddess Changing woman. Night and morning prayers were said by the individual before the hunt and special deer or antelope songs sung. The day berore the hunt deer songs were sung in the sweat house.

There vere no offerings of meat, or pollen, or colored stones during the hunt by the White Mountain. Turquoise and other stones were left at home, for it was thought no animal would be killed if they were carried. No meat was taken along on a hunt.

Continence beiore the hunt vas not compulsory, but if it were not observed both man and wonian were obliged to say a special prayer. Goodvin 147 implies that continence was observed in an anecdote of a young married couple who went into the mountains on a five day deer hunt, sleeping together but remaining continent lest the deer be driven away by the hunter's smell.

When a White Mountain hunter first sighted a deer track he sat on a stone in a sunny spot and smoked

147 Goodvin, Western Apache, p. 332.
a pipe, watching the Sun. He first puffed smoke toward the Sun. This ceremony had to be performed in the morning in order that the first puff would be in an easterly direction. After puffing four clouds of smoke toward the Sun, the hunter repeated his action toward the highest mountains in the cardinal directions, beginning at the east and moving clockwise. Prayers and songs accompanied this ceremony.

When a group of animals was encountered by the White Mountain, one at least was allowed to escape. A slain animal was directly adressed in prayer. After kilins and butchering the deer, the meat was piled uron the hide and covered with the hide. This was patted four times for luck with the prayer, "I hope I'll be awle to kill all your brothers and sisters." White Nountain hunting parties might sing all night before the hunt. Before building a camp fire, a special poker about two and a half feet long had to be cut, or bad luck would ensue.

Animal fetuses were considered good, but were eaten only by the aged, as it was thought such flesh would cause young people to become blind before they grew old. Young people did not eat the heads of deer for fear that sores would break out on their heads.

Bourke 148 states that sacrifices were made in sacred caves before hunting deer, antelope, or elk. offerings consisted of baskets, branches of pine and juniper, stones, petrified wood, and prayer plumes. Women were not present at these ceremonies, for if a pregnant woman were to observe them it was believed her child would look like a deer. Fire was kindled by friction sticks, not with flint and steel or matches. The medicine men on these occasions attempted to propitiate the animal gods whose progeny they intended to destroy.

According to Bourke, 149 the Apache threw a pinch of tule pollen to the sun with a prayer before going out on the hunt. One such prayer went, "with the favor of the Sun, or permission of the Sun, I am going out to fight, hunt, or plant, " as the case might be, "and I want the Sun to help me." Another went, "Be good, O Sun, make me succeed deer to kill." Another account of a prayer ${ }^{150}$ mentioned that it was ended with a sharp, snapping syllable, "ek," as if to call attention. Tule pollen was offered to the bear, snake, and

148 Bourke, Religion, pp. 438-39.
149 Bourke, Medicine Men, pp. 501-502.
150 Ibid., p. 504.
jackrabbit. 151
Goddard ${ }^{152}$ records, in "Prayers for Hunting Deer," some Apache tabus and prayers. Menstruating women could not eat the head or heart of a deer or the hunter would lose his povrer to kill. A hunter represented himself as coming from an attractive house so the deer would wish to come. In one prayer the hunter spoke, "Gandilxil, you are my brother. Ifurry and bring me the one you like." "Ganljin, you are my brother. Hurry and bring me the one you like." "Panther Boy, there is food in you camp. Hurry and bring me the forked horn deer that you raise." "Bullsnake, bring me what you raise at your camp." Such prayers vere used when large deer were desired.

Ariother series of prayers ${ }^{253}$ ran as follows. "Djingona'ai, my father, I spoke to Jou. I am going after that which you look upon. You must bring it to me quickly. Bring me quickly the largest male deer upon which you look." Then, after sighting the deer, "Wind, my brother, do not warn him from me." After starting again to hunt, "I am going where my sister

151 Ibid., p. 505.
152 Goddard, San Carlos Tales, pp. 62-64.
153 Goddard, San Carlos Myths, pp. 62-63.
is walking. You must hurey, my sister. I said I would come to you before the sun is very high." Then followed a prayer to the wind, "My brother, "hurry" I said to you," after which the hunter killed a female deer which came to hin. After beginning to hunt the hunter prayed, "Ganowan, my brother, what will you do? You have some deer for pets. Bring me one of them anyway I ask of you." "Djingona'ai, I am your child." "Black Whirlwind, my brother, you must hurry to help me, I say." "I am after you, I say. It shall be the largest male deer and its body shall be large. It must not be looking around, because I have prayed to you."

Goodwin 154 states that the Gan, Wolf, and Mountain Lion were all believed to have power over deer.

In a tale recounted by coodvin, 155 two deer were laid back to back on the grass to butcher so that the hunters would continue to have good luck hunting. Goodwin ${ }^{156}$ mentions power known as bilgo dzo which was used primarily for creating the love impulse in humans, but which might also be used as an added hunting power for deer, antelope, and mountain sheep

154 Goodwin, Myths and Tales, p. 91 f.n. 155 Ibid., p. 41. 156 Goodwin, Western Apache, p. 304.
when the hunting power alone was insufficient.
A few ritual practices in the hunt mentioned incidentally by Goodwin 157 were the placing of shed antlers in a tree, praying to a raven flying overhead, and the setting aside certain internal organsas an offering to Raven.

Gifford ${ }^{158}$ states that the night before a hunt the Northern Tonto chief assembled hunters at his house, where they smoked about nine in the evening, sang four deer songs, and the shaman predicted the number of animals to be killed and when. Among the San Carlos five or six hunters, at the behest of the chief, discussed the hunt, sweated, smoked, and prayed to the gan spirit in charge of deer, "Nay I have good luck henceforth; and do thou let me have another deer. "If no deer were taken after two or three days, a singing rite was held at the initiation of the hunt leader. The Cibecue with pollen in the fingers prayed to the Sun who owned the deer and could see where they vere and also to the goddess Istlenatlehe, the co-owner of the deer.

157 Ibid., p. 476.
158 Gifford, Apache-Pueblo, p. 86.

Gifford ${ }^{159}$ reports that the Southern Tonto prayed to the "father" and "mother" of the deer asking for their "children." The burden of prayer was always for continued success, according to Gifford. 160 The Cibecue and white Mountain asked, "May I kill more." The Northern Ionto asked for the father, brother, etc. of the slain deer. The Southern Tonto prayed, "May I kill a deer again." The San Carlos asked, "May I have good luck everywhere."

Before leaving on a hunt, the Southern Ionto ate only mescal, no meat or salt.

The corral windbreak was used by Northern Tonto hunting parties, a campfire being burned therein at night, while the bows and guns vere placed on a $10 g$ pointing east and sung over. While the shaman sang, a gun might discharge. 161

The Tonto groups stated that deer were the "cattle of the gan," while the White Mountain held that they were the "horses" of these spirits. 162

After slaying a deer, the Northern Tonto oriented

$$
\begin{aligned}
& 159 \text { Ibid., p. } 8 . \\
& 160 \text { Ibid., p. } 88 . \\
& 161 \text { Ibid., p. } 87 . \\
& 162 \text { Ioc. cit. }
\end{aligned}
$$

it toward the hunter's home. The Cibecue and White Mountain oriented it toward the east. 163

The Northern Tonto plugged the nostrils of a slain deer so that other deer would be less wild. 164 Gifford 165 records that the Northern Tonto and Cibecue prayed to the wolf when deer hunting (the Southern Tonto and San Carlos were not asked).

Summary and Conslusions. Meat from game animals formed a major portion of the Western Apache diet. The White Mountain and Cibecue, which were the most strongIy agricultural of the Western Apache groups, depended less upon game than did other groups. The proportion of meat in the diet varied with the seasons (autumn to spring being the principal hunting season), with the abundance of the agricultural and wild food harvests, and with the success of raids upon the livestock of the Mexicans. Before the American soldiers discupted the hunting and raiding activities of the Apache, approximately thirty-five percent of the food consumed by these Indians was meat. This figure is at best an

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\begin{aligned}
& 163 \text { Ibid., p. } 9 . \\
& 164 \text { Ibid., p. } 88 . \\
& 165 \text { Ibid., p. } 8 .
\end{aligned}
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& .93 \cdot q \text { \& } .582 \text { tiot }
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estimate based upon the recollection of informants who were never accustomed to think in exact quantitative terms. Goodwin ${ }^{166}$ estimates that meat comprised thirtyfive to forty percent of all White Mountain foods in pre-reservation times, and opler 167 estimates that in the same period the diet of the White Mountain and Cibecue was thirty-five percent meat.

Venison was not only the most important meat quantitatively but also perhaps the most esteemed. Next, in the order of their quantitative importance, were other large game, antelope, elk, mountain sheep, bear; small game; and the burros, horses, and cattle taken in raids. It should be mentioned that antelope, elk, mountain sheep, and bear, particularly the last three, were not as dependable a source of meat as deer or small game and that they were not as regularly hunted; frequently small game became of more importance. Woodrats were mentioned almost as often as venison as the most tasty meat food; badger meat and beaver tails also received mention (once each) as the "best" of the former meat foods.

Though some were more adept than others, all

166 Goodwin, Social Divisions, p. 61.
167 Opler, Fort Apache Report, p. 35.

Apache men participated actively in hunting. The good hunter was highly respected. Often the affinal relatives of such a man would offer him a plural wife - a sister, niece, cousin, or clan sister of his first wife -- to indicate their esteem and to bind him more closely to the family. Hunting ability or supernatural hunting powers were not required for chieftainship, but such abilities or powers were frequently possessed by chiefs. The Westem Apache did not make the fullest use of the fauna available in their habitat. Carnivores and bear vere not universally eaten; reptiles, wi th the exception of the chuckwalla among the Ionto and the tortoise used for ritual purposes, were lghored; certain predatory birds and water fowl were avoided; only the Tonto utilized insects (a "horned caterpillar"); and fish were unused.

Within the period of the Anglo-American occupation there have been radical changes in the Apache attitude toward, and the use of, foods. The elk, once an esteemed source of flesh, has become a tabued animal within the last forty years. Fish, once unthinkable as an article of food, are gradually making their way into the Apache diet. The fondness for entrails as the choicest parts of an animal has persisted in spite of official attempts to discourage their use and the
cultural disapproval of the whites. With venison no longer available in quantity, there has been a shift to beef as the chief meat in the diet.

## GATHERING

Formation of Gathering Parties. The gathering of wild plants was often done by individual families or extended families separating temporarily from the larger group. Others might attach themselves for a time to a family party.

A local group functioned as a whole only in occasional mass movements to a gathering area. Ordinarily the family cluster or a party made up of individuals from several families acted as the economic unit in gathering and hunting. If a family planned a trip, others, hearing of it, might join to form a party large enough to travel safely. A chief, sub-chief, or headman would be in charge.?

Parties going to the lower elevations for mescal, mesquite, or saguaro, usually a trip of ten to fourteen days, were small and worked independentiy. In other important mid-summer food harvests nearer home, the stay was usually longer, and parties from the same or different local groups often made adjacent camps. Even after the harvest they might remain in the location for a while. Though gathering parties were commonly from

[^42]the same local group, a family or cluster might join a party from another group. If two local groups combined in a gathering venture, they usually remained in separate camps. The chief of a local group arriving late might direct his people to make their camps at a distance from others, and late arrivals would ask for their clusters or local groups. ${ }^{2}$

Youths and girls when courting often went in groups to gather seeds. The girls carried the baskets and beaters. After their retum, they cooked the seeds, later taking the food to the boys' camps to be eaten. ${ }^{3}$ Children of twelve or so took an active part in the procuring of foods. Usually the boys hunted simall game, while the girls gathered. Salt gathering trips were usually made by men, though women sometimes accompanied them.

Men took practically no part in the gathering of plant foods, except moscal. Here they performed the heavy labor of preparing the fire pits. One old man repeated the exhortations of his grandmother and widowed mother in his youth: "when you get big, you

2 Ibid., p. 159.
3 Goodwin, Myths and Tales, p. 123 and f.n.
will marry. If you are lazy, everybody will laugh at you. You hunt. You get horses. You go with your wife and $d i g$ mescal and pick up the wood and $f i x$ it for her. You pack it where the oven is. Don't go away - you afraid to stay -- come back while I talk to you. " Then when she finished, I would go play and forget everything right avray."

Migrations and Camps. Goodwin ${ }^{4}$ explains the semi-nomadic existence of the Western Apache on the bas is of their subsistence activities. According to him, agriculture, the hunting of large game, and the use of wild plants and small game all played an important part in their mode of life. Hunting and the gathering of wild plant foods kept them moving, because the food plants grew at different altitudes and in different seasons. Food gathering journeys took from ten days to a month. Pack horses vere used when available, but foot travel nemained general. Possessions were packed on the back in burden baskets when people were afoot. According to Goodwin, 5 most of the White Nountain left their fields when the corn was about three

[^43]feet high to gather wild plants, returning in September for a month of harvest. Informants stated that they not only spent much of the summer gathering, but that a majority of the people often spent the winter in the lower country south of the present Fort Apache Reservation.

After the agricultural harvests in fall and the local wild plant harvest, particularly acorns, had been gathered, families migrated south across the Black or Salt Rivers and remained in mescal areas until March or April. They camped at different places each year, because the mescal would be exhausted in previously harvested areas.

An upper Canyon Creek man described the anmual migrations of his family in the eighties in considerable detail. The family consisted of husband, wife, wife's mother, and a varying number of small children, of whom this informant had been one. Three horses vere taken. Small children sometimes walked, sometimes rode with a parent, sometimes rode a led horse. The grandmother walked. (Observation confirms the statement that "the oldest woman never rides a horse.") The equipment carried included one mano (but no metate), one burden basket, four pitched water bottles, one coffee pot, one frying pan, one bread pan, and one
butcher knife. The duffle was packed in skin and cloth saddle bags. (These are rectangular bags, usually half again as large as a gunnysack; the only opening is a slit across the center of one side. They are loaded through this slit, the load balanced equally in each end, and the bag slung across the saddle of back of the horse.)

The order of march was man, woman, and boy. An attempt was made to be careful that the trees on the trail did not rip the pack sacks. Nevertheless, this frequently occurred. According to Goodwin, ${ }^{6}$ on such marches the boys always carried the pitched water baskets and sometimes the juniper-bark torches for making fire. To make them strong and helpful they were also mado to carry other loads.

The family usually camped early in order to gather wood and water and to prepare beds. Beds were made of weeds and grass, and were placed near the fire. Occasionally they were made under a tree or between trees. Santee ${ }^{7}$ observed that the Apache always bedded under some kind of shelter, even if it was only a few bushes; the Indian would build a small individual fire,

[^44]rake away the coals when the ground was warm, then curl up on the warmed spot with feet to the hot coals.

The family arose before sunrise. Breakfast was cooked and eaten and the horses found, of the father might go after the horses while the meal was being prepared.

The Salt River crossing was made with some care. Men and horses swam it, swimming diagonally to the current. Children crossed on the horses. Whey were not tied to the horses, but were tied together with a rope which encircled all the children on a horse. Women were helped across by means of two ropes tied at the waist. A man held the end of each rope. The one in front swam ahead until he secured footing, then pulled the woman in, while the one in the rear paid out the other rope. Sometimes people crossed holding on to the tails of the horses.

After the winter camp grounds had been reached, mescal was prepared twice, once upon first arrival and again just before returning to the agricultural sites. Camp was moved every fifteen days or so for better grounds. People led a rather leisurely, pleasant existence. The men hunted deer; the women made baskets; the boys hunted small game, brought in the horses, and played.

The winter camps were temporary habitations. If rain threatened, a ramada could be erected by a man and wife in about two hours. If it vas windy, oak or mesquite or any kind of brush was piled on the north and south sides of the camp with a fire in the middle; this brush shelter might be put up alone without the overhead protection of the ramada. Wickiups were never built. These winter camps were warm during the day, but sometimes cold at night.

Implements and Techniques. Implements used in gathering included digging sticks, poles to knock off or hook down fruits and nuts, cactus tongs, seed beaters, knives, and carrying baskets or sacks.

Gifford ${ }^{8}$ describes the digging sticks used for tubers and roots as being eighteen to thirty-six inches Iong and one to two inches thick. The Gibecue and white Nountain sticks were chisel bladed. At times they were driven into the earth with a cobble. Western Apache mescal digging sticks were a.11 chisel-bladed and cobble driven. They varied from three to six feet in length.

All Western Apache used a special knife for trimming mescal leaves. 9 One examined was of readish

[^45]chert, oval in shape, three and three-fourths inches long, one and seven-eighths inches across the short diameter, and three-eighths of an inch thick.

Knives were also used in seed gathering. The Northern Tonto used an ash-wood knife for severing sunflower heads. The Southern Tonto had a single-bladed wooden knife sir to eight inches long, which was used only for sunflower heads; a stone knife was used for the same purpose. Cutting was by pressure, not by sawing. For sunflower heads the Cibecue used a stone knife. 10 All Westem Apache used long straight poles for reaching the branches of trees. For hooking saguaro fruit, poles with diagonal crosspieces were used. 11 The crosspiece was attached in such a way that two acute angles were formed; the fruit could then be caught and pulled off with one inside angle or pushed off with the other. 12 The poles were often of saguaro ribs lashed together to attain sufficient length. Both the White Mountain and the San Carlos used a stick for acorns, the latter an ocotillo stalk. Both collected pinon nuts, hoviever, after they had fallen to the ground. The

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\begin{aligned}
& 10 \text { Ibid., pp. } 95-96 . \\
& 11 \text { Ibid., p. } 11 . \\
& 12 \text { Ibid., pp. } 91-92 .
\end{aligned}
$$

Cibecue used a stick to dislodge both acoms and pinon cones. 13

Pruits of the small cacti were picked with tongs made from a split stick bent double.

Receptacles used in gathering included the twined burden basket, buckskin sacks, and occasionally old pitched baskets or basket trays, the lattor being used to catch seeds as they were beaten from bushes.

Gifford ${ }^{14}$ states the Northern Tonto beater was made of sumac stems. A White Mountain informant described the beater as being something like a tennis racket, only smaller, about eight inches wide, nather flat, and curved at the end. It was woven of bear grass.

A Tonto tool which served a multiple purpose is described by smart. 15 It was a stick about fivo seet long, hooked at one end, but otherwise straight. This was used to hook the fruit "Ieguara" and for loosening the earth in breaking into a nat's nest or rabbit's burrow. Such sticks are carried by elderly White Mountain and Cibecue men and women, who use them as an aid in walking; no other usage was described.

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\begin{aligned}
& 13 \text { Ibid., p. } 91 . \\
& 14 \text { Ibid., p. } 136 \text {. } \\
& 15 \text { Smart, Tonto, p. } 418 .
\end{aligned}
$$

The Southern Ionto and Cibecue sometimes climbed trees by means of a sapling leaned against the trunk. Among the Cibecue both men and women climbed trees. The men of the two Tonto groups did most of the climbing, while the women did most of it among the San Carlos and White Mountain. ${ }^{16}$

Gifford ${ }^{17}$ reports that patches of grass and brush were burned over to insure a better crop of seeds, etc, by the Northern Tonto, Southern Ionto and White Mountain. No information was obtained on this except that among the Cibecue patches of wild tobacco were burned over. Both Cibecue and White Mountain burned "trees" (probably willow and sumac) to bring out the young shoots desired for basket making.

Ownership and Marking. Trees and wild plants growing on farm land belonged to the owner of that farm among the White Mountain and the Cibecue. Other than this there was no restriction as to where one might gather or hunt so long as he remained in his group's territory. A case of ownership of wild plants at Spring Oreek among semi-band Two of the Southern Tonto

[^46]is reported by Gifford. 18 Here a large patch of an edible seed plant was owned. Only four women (of four families) were permitted to gather.

Though wild plants were not ordinarily owned, certain plants or products were frequently marked in some manner to indicate the claimant's right to gather them. This applied only for a single season. The discoverer of a honey tree could establish a claim to it by placing a pile of rocks by it. Groups of people claimed sunflowers by tying a bunch of heads together before the seeds ripened. A stick set in the ground or hung on a tree would mark a patch of plants or acorns. An individual could designate only a limited number of trees for use, "just five or six," and only the tree Where the stick was placed vas reserved. Even then aggressive persons would sometimes throw the stick away and harvest the products. Other individual methods of marking acorn trees were by the use of grass, soapweeds, and stones. At present, a aress, shawl, or ribbon is customarily used.

## Division of Products. Although the "poor" fre-

 quently asked the "rich people" and chiefs for agri-$$
18 \text { Ibid., p. } 167 .
$$

cultural products or for meat, they did not usually ask for wild plants, because there was enough available for everyone. The few who begged continually, even for wild plant food, were likely to be given it, but were regarded with mild contempt as lazy and worthless. People were very generous with their gathered foods. The first family to gather a newly matured wild plant crop distributed a portion to others. "Whoever got the acorn or mescal first, pretty soon everybody had it." Such donors would be remembered at another time by those who received food from them.

In one local group at Cedlar Creek the chief sent designated families to procure mescal, while others were sent to hunt or told to plant. The produce vas divided among all.

Trade. Wild food products were not infrequently traded or exchanged with other groups or with nonApache. The Cherry Creek people traded mescal (together with burros, baskets, and buckskins) to the Tontos and Yavapai. The White Mountain traded mescal (and also burros and baskets) to the Pueblo for blankets. The Navajo gave blankets to the white Mountain for mescal, wild berries, salt, and baskets.

San Carlos Apache visited Diablo, an Eastern

White Mountain chief, and gave him mescal and saguaro fruit. When they departed they bore presents of blankets, com, and buckskins. 19

Storage. Some wild food crops were stored in caves close to the area in which they were gathered, but most were carried home for winter use. Here they were stored in a ground cache, tree cache, or wickiup. The largest and most permanent wickiups were always built here and were called by the special name "ripe fruits wickiup," which referred to the plants stored in them. 20

The White Mountain scattered their caches in case of emergency. There were as many as five or ten to a family, some large, some small, some fór agricultural products, some filled with wild products. Some were near the permanent agricultural honesites, others were near the winter gathering grounds.

Tree caches were used for dried meat, berries, cactus and yucca fruit, and mescal. At the home site a platform cache might be built in a tree. Elsewhere the cached products might simply be hung from the branches.

[^47]Rock shelters and caves vere often used for storage. Goodwin ${ }^{21}$ notes that such storage was usually In olla-shaped baskets among the White Mountain. According to Gifford, 22 pottery and baskets were used for such storage. Among the baskets used by the Northern Tonto was a coiled storage basket with a three-rod foundation, the design in Martynia. Its top was covered with grass. The cibecue used a twined storage basket "so large that a woman had to get inside to make it." The Cibecue granary (for agricultural products?) was on a platform in a cave. To store seed, the Cibecue sometimes piled it on a cave floor. 23

In the ground caches were stored, in addition to agricultural products, pinon nuts, acorns, and sometimes dried mescal. The pits were lined with slabs, juniper bark, or grasses, and were sealed with grass or bark, slabs, and earth. The White Mountain, at least, tended to place them where the morning sun would keep them dry. Seeds were stored in pottery vessels or old pitched water baskets or gourds. Buckskin sacks or bags, storage baskets, and even old burden baskets were

[^48]Mescal. The most important vild food plant was mescal (Agave sp.). 24 Eaible species of agave grew close to Cedar Creek and also in the area between cibecue and Canyon Creeks. However, the preferred plants were obtained in lower country. One Cedar Creek informant stated that "the real good and big mescal is at Bylas Nountain." A Canyon Creek man said the best mescal was "where the big cactus grows" south of the Salt River. Goodwin ${ }^{25}$ reports that the southern slopes of the Natanes Rim and Mount Tumbull and the Graham Mountains were favored spots for mescal gathering by the White Mountain Apache. According to Castetter, 26 the species used by the Western Apache must have been Agave parryi, Agave palmeri, and Agave couesii. When other foods were not available, life was often sustained for weeks at a time by mescal. The Chiricahua were said by informants to have lived on nothing else for long periods. Bourke 27 states,

[^49]"Mescal was to the aborigines of that region (Fort Grant?) much what the palm is to the nomads of Syria." The crown of the mescal provided food, the juice was fermented into a drink, the thom with its adhering filament served as needle and thread, the stalk was used for a lance shaft, and a "fiddle" was even fashioned from the stalk.

The agave plant could be used at any season. Customarily, after the corn harvests, groups went to areas where the agave grew to prepare mescal for the winter. If the supply on hand was small, a new supply was gathered and prepared during the winter. In the fall and winter good edible plants could be selected by observing the leaf bases and the terminal shoot, a thickening of which indicated that the plant would bloom the following spring. the best time for gathering was in the early spring, usually in April, at which time some of the plants blossomed. At this season enough mescal was prepared to last through the summer or longer. The Canyon Creek parties which wintered south of the Salt River (a majority of the band) prepared mescal twice, once upon arrival at the winter grounds, and again just prior to their departure north, When enough was prepared to last until the following autumn.

Because of the difficulty of preparation, mescal gathering and roasting vas usually a cooperative enterprise involving from five to eitht women. The party might be composed of neighbors or of an extended maternal family or group of relatives. Small panties frequently left their local group for a few days for the express purpose of preparing mescal. often, however, nearly a whole group wintered in an agave area, the parties spreading out around their winter camps to gather the agave crowns.

A roasting place was selected in an area where there was a good stand of agave. From this the women of the party fanned out in groups of two or more, frequently searching a radius of a mile or more from the roasting pit to find suitable plants.

Implements needed in gathering were a mescal
chisel and a mescal knife. The chisel was a straight stick of oak or other suitable wood, two and a half to three or more feet long, one and a half to two inches in diameter, with a wedge-shaped end. The chisel end was placed under the crown of the agave and the shaft driven with any convenient stone to sever the root of the plant. After the plant had been cut or pried loose, the leaves were trimmed with the mescal knife. Prior to the introduction of metal tools, this was an
unhafted chert blade (described under Skins in the section on Hunting).

When severed, the crowns, weighing as much as twenty pounds each, were carried to the roasting pit. A head was carried in each hand by the leaf bases. The burden basket was not used for this, because the sticky juices of the plant would penetrate a sack or basket and cause the packer's body to swell and itch. However, Curtis ${ }^{28}$ implies that the White Mountain women carried the heads in burden baskets. Several days might be required to gather the requisite number of plants, depending, of course, on the amount desired and the accessibility of the plants. Forty or more crowns were commonly roasted in a pit at one time.

The labor of preparing the roasting pit was considered men's work. While the women gathered the plants, the mon dus an earth oven or cleaned an old one, the dimensions varying from three to twelve feet in diameter and froin two to four feet in depth. After digging or clearing the pit, they filled it with wood laid in a criss-cross pattern. The fuel was invariably oak, for pine or other woods were said to spoil the flavor of the mescal. Over the wood was placed a layer of stones.

28 Curtis, North American Indian, I, pp. 17-18.

These were round, not flat, and five to eight inches in diameter. While any available stone could be used, vesicular lava was preferred, for it was thought to retain the heat.

When preparations had been completed, the fire pit was ignited in a prescribed ritual manner. This was done exactly at sunrise by a "Iucky" person fone whose participation insured success). This man or Woman prayed that the mescal might be well cooked, then lit the wood successively at the east, south, west, and north sides of the pit. According to curtis, 29 it was necessary to make fire with a fire drill, not with matches. Goodwin 30 recounts a White Nountain myth which purports to give the origin of the lighting ceremony and prayer. Coyote set fire to the wood in the pit and said the prayer now used, "I am going to light this fire from the Sun. Fire which never goes out, Black Sun, his fire, he sets fire to it." Black symbolized holiness. It is the belief of all the Westem Apache that if any of the participants indulge in sexual intercourse while the mescal is being cooked, it will be underdone

29 Loc. cit.
30 Goodwin, Myths and Tales, pp. 56-57.
and inedible. 31 A White Mountain woman reported that the old people who lit the fire at the mescal pit or corn roasting pit, where the same tabu applied, invariably enjoined those present not to break the tabu. They apparently delighted in embarrassing the Jounger onlookers, who would turn red in the face and squirm on such occasions.

Gifford ${ }^{32}$ states that among the Northern Tonto, Southern Tonto, and White Mountain, the fire was lit by a summer-born person. Gifford ${ }^{33}$ also notes that the Northern Tonto women used a scratching stick for two days while cooking mescal.

When the fire was lit, it was allowed to burn until the fuel was completely consumed. Mescal could not be placed in the pit if the fire were still smoking. When the fuel had burned, green or wet vegetation, brush, grass, rushes, or leaves were hastily placed in layers over the white-hot stones, the mescal crowns were placed on these and in turn covered with other layers of vegetation. The whole was covered with a foot or more of earth. Informants agreed that a surface fire was

31 Gifford, Apache-Pueblo, pp. 12 and 93.
32 Ibid., p. 12.
33 Ibid., p. 93.
never placed on an earth oven and that mescal was alvays cooked two days and nights, a total of nearly fortyeight hours. However, Reagan 34 states that a fire was built on top of this mound and kept burning and that the cooking time was about twenty-four hours. Gifford 35 records that a fire was used on top of the oven by the Cibecue during part of the cooking time.

On the second morning after the fire-lighting, the mound was opened and the cooked mescal heads removed. The means by which each woman recognized her own mescal varied. Sometimes each threw her plants into a different part of the pit. The San Carlos, according to Gifford, 36 marked a place in the mescal pit. A White Mountain man stated that the women manked their mescal with different kinds of grass, some using blue grass, some bear grass, etc. A Cibecue man stated that the women did not attempt to separate their mescal in the ovens but "branded it, just like cutting the ear of a cow" by trimming their heads in characteristic patterns, one leaving one leaf on, another two leaves, etc.

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34 Reagan, Notes, p. 293.
35 Gifford, Apache-pueblo, p. 15.
36 Ibid., p. 12.
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The cooked mescal was pounded flat with stones into sheets an inch or two thick and two or three feet in diameter. It was dried by placing it near a fire and turning it, or by placing it on specially constructed drying racks or stones to dry in the sun. A mescal drying frame was constructed like a miniature ramada. It was about two feet high, with a surface area of about three by four feet. Bear grass was placed on top of the rack.

The dried sheets of mescal were rolled and tied with bear grass, some five or six sheets to a bundle. When dried in this manner, it was said to keep well for a year. One man stated it would keep six years. When mescal was transported, bundles were wrapped in grass and carried in a network of yucca. Two bundles were attached by cords of yucca and placed across the back of a horse in the manner of a pack saddle. Four bundles were carried on a horse.

Mescal was said by more than one informant to have been his favorite food. While preparing it, the Apache always chewed a piece. The heart of the crown, the sweetest part of the plant, was usually reserved for children, who were given slices of it to eat "like candy."

Mescal was eaten both fresh and dried. Curtis ${ }^{37}$ tates it was usually made into a gruel and that berries of aromatic sumac and wilnuts were crushed and added to give it flavor.

Palmer 38 states that one of the choice dishes of the White Mountain Apache consisted of ground walnuts and dried roasted mescal. This was eaten with corn bread.

A fermented drink made from the heart of the mescal plant was described by Curtis 39 and Reagan. 40 According to them, the cooked mescal crowns were left in a heated pit until they began to ferment. Then they Were ground and boiled or boiled first and then ground, and the liquor poured off and allowed to stand until fermented. A Canyon Creek man stated that it was fermented entirely in a vessel, not in a pit. He $21 s 0$ described a mescal drink in which the juice of the mescal was strained and mixed half and half with tulapai water (the liquor of fermented maize) and allowed to stand in a vessel for five or $s i x$ days. At the end of this time

37 Curtis, North American Indian, pp. 17-18.
38 Palmer, Customs, p. 168.
39 curtis, op. cit., p. 20.
40 Reagan, Notes, pp. 293-94.

It was a stronger drink than tulapai. According to him the present generation of Apache are unfamiliar with this process.

A sweetish liquid was shaken from the flowers of agave after a rain, usually in mid-June. This liquid could be used with tortilla bread or with coffee, or it could be drunk. The fluid was emptied from the flowers into a basketry or pottery cup.

The agave flower stalk was baked when young, but not too young, and chewed for juice. At the present time a. few Apache grow sugar cane and use the stalk in the same manner. It is said to taste the same. The agave stalk, used at one time for lance shafts, is today frequently fashioned into hoe handles.

A light brown paint was obtained from the hardene mescal juice which covered the pit stones after a baking. This was used by young girls to daub on their cheeks, and mas also occasionally used to paint stripes on buckskin. Bourke 41 notes that the Apache scouts painted their faces with the juice of the roasted mescal or with red ochre or deer's blood as ornamentation and protection from sun and wind. The hardened juice had only to be moistened before being applied.

41 Bourke, Apache Campaign, pp. 26-27.

Gifford ${ }^{42}$ states that the stalk and butt of sotol (Dasylirion sp.) were roasted and eaten by all the Western Apache. Other uses noted by him were the eating of the flowers by the San Carlos; eating of the seeds by Northern Tonto and Southern Tonto; and as a detergent by the San Carlos. The author's only information is that "the mescal with thorns" was not used when "other mescal" was available.

Acoms. The acorn (Quercus sp.), if not as important as mescal among most of the Western Apache groups, was at least second to it. The Northern Tonto, according to Gifford, ${ }^{43}$ rated it their most important wild crop.

Several varieties of acorns were used. Among the Southern Tonto there were four oaks, according to the native classification, these being, in order of preference, Gambel's (Quercus gambelii), Emory's (Quercus emoryi), scrub (Quercus undulata), and another type (Quercus Sp.), the last two being about equally the third choice. The San Carlos used the scrub-oak acorns (Quercus arizonicus), but did not like the acorn of the 42 Gifford, Apache-Pueblo, p. 13. 43 Ibid., p. 92.
"blue oak" (Quercus sp.). 44 Reagan identifies the acom used on the Font Apache Reservation as from Quercus undulata, var. 45 Acorn "coffee" is made by the White lountain from the parched acorn of an unidentified oak. It was said to be less greasy than the former. Acorn "tea" is made in May from the leaves of still another unidentified oak.

The acorn matured in late July and August. Today (1947-1948) the acorn is the only wild plant for which large gathering excursions are made; many families at Cibecue still travel to Pleasant Valley, west of the Reservation boundary, and remain for a meek to gather them. This area had always been a favorite acorn ground of the Cibecue Apache. The Cedar Creek and East Fork groups of the White Mountain gathered acorns along the Black River or south of the river. Goodwin 46 states that the best acorn grounds were along the southern face of Natanes Rim from Blue River to Arsenic Tubs, in the vicinity of Eagle Creek farm site, and in the gap between the Graham and Santa Teresa mountains. Trees with promising crops were frequently reserved by

44 Loc. cit.
45 Reagan, Plants, p. 148.
46 Goodwin, Western Apache, pp. 156-57.
marking them.
Straight long poles vere used to dislodge acorns. The White Mountain and Cibecue also climbed the trees and shook the acorns to the ground. ${ }^{47}$ large parties usually participated in the acorn harvests, sometimes Whole local groups. 48 Women and children usually did the gathering, transporting the nuts to camp in sacks or baskets.

Acorns were stored shelled or unshelled, in burden baskets, pitched baskets, buckskin sacks, gourd or pottery vessels. Giffor $4^{49}$ states that none of the Western Apache stored acorns in skin bags, but a White Mountain tale recorded by Goodwin 50 indicates storage in buckskin sacks, and this was confirmed by informants.

Acorns, as other foods, were cached at times in rock shelters, but not in ground caches, because they easily became damp and rotted. Though difford 51 reports that the White Nountain stored their acorns shelled, lest they become wormy, two White Mountain

> 47 Goodwin, Experiences, I, pp. 33-34.
> 48 Goodwin, Western Apache, pp. 156-57.
> 49 Gifford, Apache-Pueblo, p. 12.
> 50 Goodwin, Myths and Tales, pp. 60-61.
> 51 Gifford, op. cit., pp. 92-93.
informants indicated a preference for storing them unshelled. They stated that if shelled before storing, they developed a bad taste. If the unshelled acorns were dried in the sun three days to a week prior to storage, they would not become wormy.

The sweet variety of acorn was eaten whole and raw. Usually, however, acorns were ground on a metate for use without further preparation. Though metates of vesicular lava were preferred for other uses, sandstone metates were regarded as most desirable for acorns. Stone mortars were also used to grind acorns, at least by the Southern Tonto ${ }^{52}$ and by the White Mountain. Acorn flour was eaten dry or moistened, mixed with soups, pounded into meats, and sprinkied on foods. Whole acorns were boiled like beans by the Southern Tonto, according to Gifford, 53 who also reports that acorn meal was boiled in soup by the Northern Tonto and Southern Tonto. White Mountain and Cibecue informants gave no recipes in which acorns were boiled and stated that boiling them produced a disagreeable taste.

Acorn bread is reported for the Southern Tonto

52 Ibid., p. 12.
53 Ibid., pp. 11 and 12.
by Gifford, 54 and for the White Mountain or Cibecue, probably Cibecue, by Reagan, 55 who states that acorn meal was mixed with wheat flour in the proportion of one to five. Confirmation of Reagan's acorn bread recipe was not obtained.

Gifford ${ }^{56}$ reports that there was no roasting of acorns on coals or parching in wooden or pottery bowls. However, parching was reported by the white Mountain.

A universal Western Apache dish was meat stew to which was added uncooked acorn meal. This was said by some to have been and, even today, to be their favorite food. The recipe had only to be mentioned, particularly among a group of old men, to start a nostalgic reminiscing on the tastiness of their former foods.

Acorns and corn were sometimes parched, then ground, and eaten dry by the pinch. Ground acorn meal, unparched, was eaten dry or moistened, mixed with soups, and mixed with boiled meat or ground with it. Ground cooked meat and acorn meal was as popular as the stew mentioned above, and was indeed only a dry variation of it.

54 Ibid., p. 12.
55 Reagan, Notes, pp. 294-95.
56 Gifford, op. cit., pp. 11-12.

Mesquite. The pods of the mesquite (Prosopis chilensis $)^{57}$ were esteemed as food, out they were secondary in importance. Goodwin 58 states that they were not sufficiently important to induce a concentrated harvest movement.

Mesquite grew abundantly only at lower elevations, along the Gila and Salt River Valleys. Scattered specimens are to be seen at Cibecue (elevation 5000 feet), but all were said to be near old camp sitos and to have had their origin from seeds spat out or thrown away after people had brought pods from the Salt River. The Cibecue beans are not plentiful and they were said to be of poor quality. The plants themselves were described as growing "here like a bush -- down at the Salt River like a tree."

The mesquite ripened in late August. Parties from Cibecue and Canyon Creek went to the valley of the Salt in september and October to gather the pods and brought them back in skin sacks. Goddard 59 writes of the pods falling from the tree and being picked up by

57 For the distribution and use of mesquite in the Southwest, see Bell and Castetter, Mesquite.

58 Goodwin, Western Apache, p. 157.
59 Goddard, San Carlos Texts, pp. 364-65.
the San Carlos Apache, and Hrdlicka 60 reports that the partial spoiling of the pods by worms did not prevent their use by these peoplo.

After being gathered, the pods were either reduced to flour by pounding while fresh or were dried and stored. Accounts in the literature of Apache usage are brief and confusing, and the accounts of informants equally so. However, it appears that when the fresh pods were pounded, the seeds wore left in and pulverized with the pod; that if the pods were dried before being used, the seeds were discarded.

An informant from Cherry Creek stated that the mesquite beans were pounded in a hole in the earth, the bottom being lined with slabs of stone. A long stone pestle was wielded with two hands, and pod's and seeds were ground together. In the pounding process as described by an upper canyon creek informant, a bedrock mortar was used ("they made a well in a flat rock"). Pounding was done with a round stone pestle, and the seeds were discarded before pounding.

Reagan ${ }^{61}$ states that the pods and seeds were crushed on metates. Hrdlicka ${ }^{62}$ reports that the San

60 Hrdlicka, Medical Observations, p. 258.
61 Reagan, Plants, p. 145.
62 Hralicka, Ioc. cit.

Carlos pounded the pods to a pulp in a rock cavity, or that they dried the beans, discarded the seeds, and pounded the pods. Gifford ${ }^{63}$ notes that the beans were pounded in a stone mortar and the seeds removed by all Western Apache. He also states that no WestemApache ground the pods on a metate; however, a White Mountain informant averred that this was sometimes done.

Palmer 64 reports that the ripe beans were ground fine on a metate, mixed with water, and made into cakes which were baked in the ashes or dried in the sun. He does not indicate whether this was for storage or for use.

The pounded pulp of the newly gathered beans was often squeezed for the juice, which was drunk, and the fiber discarded. The pounded bean was said to make "pretty heavy food." It wils drunk "thick and white, just like milk."

Stored aried beans of the mesquite vere chewed and the pulp and seeds expectorated. Children liked to chew them between meals. They might be pounded into flour. Nesquite flour could be "eaten as candy" or mixed into a mush and eaten. A drink vas also made

63 Gifford, Apache-Pueblo, pp. 12 and 93.
64 Palmer, Customs, p. 169.
from the flour by mixing it with "warm water, not too hot."

If mesquite flour was to be stored, it was moistened and allowed to harden into cakes in a basket tray. Then it was stored in a large basket. The cakes would keep a jear or two. The white Nountain frequentIy made a hole in the center of the mesquite cakes and strung them on a cord. In this way they could be conveniently transported.

Mesquite pitch was chewed as a substitute for gum, especially by children. It was also used to attach arrow points to shafts. The San Carlos mere said to have used mesquite almost exclusively for firewood, for which it is excellent.

The screw bean (Prosopis pubescene) did not grow in Western Apache territory. A Cibecue informant had long preserved a bean brought back from Mexico by his father, a scout, and placed it in his ear for earache. This remedy he believed had been recommended to his father by Mexicans or Chiricahua hostiles. Gifford 65 states that the juice of the screw bean was used by the Warm Springs Chiricahua for earache and that the Warm Springs, Mescalero, and Lipan gathered the screw bean

65 Gifford, Apache-Pueblo, p. 93.
from the Rio Grande area and prepared it like mesquite.

Cacti. Saguaro (Carnegiea gigantea) ${ }^{66}$ was a relatively unimportant wild crop, and few people went to gather it. In the low country in the Gila valley, it ripened in July. 67 The White Mountain often vent to the Arivaipa territory in the San Pedro Valley, where the Arivaipa chiefs allotted them part of the gathering grounds. 68 According to Hrdlicka, 69 the San Carlos stayed two or three months at the saguaro grounds until all the fruit was matured and gathered. Bourke 70 states that the Apache went out to gather pitahaya and at the same time make war on the pima and Papago. A long pole, usually fashioned by lashing together saguaro ribs, was used to remove the fruit. usually a crosspiece was tied at one end so that two acute andes were formed with the pole; the upward projection of this crosspiece was pushed, the downward projection pulled to detach the fruit. The Southern

66 For the distribution and use of saguaro in the Southwest, see Castetter and Bell, Tall Cacti.

67 Goodwin, Western Apache, p. 156.
68 Ibid., p. 54.
69 Hrdlicka, Medical Observations, p. 257.
70 Bourke, Folk Foods, p. 52.

Tonto and San Carlos used a pole with an end hooked to an acute angle. 71

The saguaro fruit was eaten raw or dried and made into cakes. The juice was expressed by squeezing before the fruit was placed on a rock to dry. The liquid was drunk. The seeds were washed and ground.

Bourke 72 states that the Apache women made a preserve by boiling the saguaro pulp.

The Cibecue parched the seeds in a basket. They sometimes pulverized them with maize. ${ }^{73}$

The dried pulp was kept throughout the year and used as a sweet or mixed with mescal juice.

Hrdiicka ${ }^{74}$ states that the dried fruit cakes became wormy after six of seven months but still preserved good color and odor, and were eaten by the women and children. The seeds were roasted by the San Carlos, ground, mixed with water, and eaten as mush. Gifford75 notes that the Cibecue and White Nountain wrapped the saguaro cakes in willow bark for transport and for

71 Gifford, Apache-Pueblo, pp. 11 and 91.
72 Bourke, Folk Foods, p. 52.
73 Gifford, op. cit., p. 94.
74 Hrdlicka, Medical Observations, p. 257.
75 Gifford, Loc. cit.
cleanliness. A White Mountain woman stated that mesquite bark, not willow bark, was used to wrap saguaro and mescal.

The saguaro burls were used, two together, by the Cibecue as containers for caked dried fruits and also as vessels in which to soak the dried fruit. ${ }^{76}$ These burls were very hard and shaped like a cup, for which they were often used.

A drink vas made. from the saguaro fruit by the White Mountain. The whole fruit, seeds and all, was mashed with the hands, water added, placed in a jar, and buried in a dry place for two days. When removed it was drunk immediately and was said to be better than tulapai. Seeds were saved and ground with corn into a pudding.

The fruits of many kinds of cacti were used by the Apache. A white Mountain woman named nine kinds used by the Apache in the East Fork area. Of these nine varieties, five were early ones, four were large ones, one was designated as "eagle" prickly pear, and there were five different colors of fruit. Reagan ${ }^{77}$ states that "a great variety of cactus fruit is found

[^50]in the (Fort Apache) region, ranging from sour to sweet." Gifford 78 records the fruit of two kinds of cacti used by the Northern Ionto, four by the San Carlos, seven by the cibecue, and eight by the White Mountain. At one time long journeys were made to gather cactus fruit. The women gathered the fruit with tongs of split sticks and removed the spines with a grass brush, with weeds, or by rolling it about on the ground. Reagan ${ }^{79}$ reports that the spines were rubbed off with a piece of buckskin; no informant had seen or heard of this method. The gathered fruit was packed in a burden basket.

The fruit of the prickly pear was peeled and eaten raw, except for a sweet variety which was made into a kind of butter. 80 seeds were eaten with the fruits. The seeds of some varieties were so large that children who ate them often had difficulty with elimination; an informant shook with laughter as he told how a boy after eating these would "cry and cry."

The fruit was also "split like peaches" and

[^51]dried on a rock, then stored for later use. Curtis ${ }^{81}$ states that seeds and pulp were ground together into a paste. Gifford ${ }^{82}$ notes that the Northern Tonto dried the fruit and stored it in round, thick cakes similar to cheese.

All White Mountain and Oibecue informants denied the grinding of prickly pear seeds except one Cherry Creek man, who stated that cactus seeds were used; but it is not certain whether his statement applied only to saguaro or also to prickly pear. Gifford ${ }^{83}$ indicates that the Southern Tonto ground Opuntia seeds and mixed them with acorn meal, but denies the use of the seeds by the other Western Apache. 84 Hrdlicka ${ }^{85}$ states that a high branching cactus which he tentatively identified as Opuntia arborescens Engelm? or Opuntia whipplei Engelm? was used by the San Carlos. They parched, ground, and boiled the seeds into a mush, or ate the flour of the seeds washed down with water.

The sap from prickly pears was reputedly a cure

81 Curtis, North American Indian, I, p. 19.
82 Gifford, Apache-Pueblo, p. 95.
83 Ioc. cit.
84 Ibid., pp. 13 and 94.
85 Hrdlicka, Medical Observations, p. 257.
for sores. The "leaves" were opened and placed on burns.

One variety of small-seeded prickly pear was said to have been brought north to the cibecue area from the salt River valley, and to have obtained its start from seeds expectorated by those eating the fruit.

Bourke 86 states that "The Apaches say that the use of this fruit (tuna or nopal) must be attended with some precautions, as it predisposes to fevers."

Cholla (Opuntia Sp.) was reported by Gifford 87 not to be used by the Western Apache, though the Northern and Southern Tonto were not included in his inquiry. However, its use was affirmed by both White Mountain and cibecue informants.

A White Mountain woman stated that the yellow cholla fruit was usable if gathered during a certain limited season. It was pit-baked for one day, water being added to the pit to steam it in the same manner as green corn was baked. When dried it would keep for a. year. It was boiled with fat or in soup. The seeds were left in the fruit and were never used separately.

A Canyon Creek man stated that cholla fruit was

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\begin{aligned}
& 86 \text { Bourke, Folk Foods, p. } 44 . \\
& 87 \text { Gifford, Apache-Pueb } 10, \text { p. } 13 \text {. }
\end{aligned}
$$

picked when it became jellov, fully ripe, in the fall. The fruits were placed in a fire and cooked. They were dried, cracked, and the seeds removed. The seeds were then roasted in an open pan "like roast coffee," mixed with soft corn, and ground. The cholla seeds were never ground alone, always with com. The ground meal was placed in the mouth dry or after it had been moistened with a little water and salt.

The informants had never heard of cholla. "joints" being used for food, only the fruit and buds, but cholla had some medicinal uses among the canyon Creek band. The peeled stalks were used for burns. The boiled roots were said to make the best laxative for a baby or simall child. A tablespoonful would cause the bowrels to move; on the other hand, if movements were thin and frequent, it was also used.

A small multiple barrel cactus was stated to produce edible fmuit. This was gathered by the basketful in mid-June. The fruit was said to look and taste like a long strawberry. It was eaten rav and never preserved. The plant was also used for burns.

Barrel cactus was occasionally cut and pounded to obtain water, according to informants, but was never used as an improvised cooking vessel.

Hrdlicka ${ }^{88}$ reports that the San Carlos parched, ground, and boiled into mush the small black seeds in the yellow fruit of Echinocereus wislizeni, and that when extremely thirsty they used the insipid juice of the plant.

Yucca Baccata. The fruit of the Yucca baccata 89 matured in early Soptember. 90 Informants stated the fruit must be cooked before drying, or it would spoil. After roasting, the fruit was split, the whole seed ribbon removed, and the fruit dried on bear grass. When stored, it was wrapped in bear crass and treecached. With such open storage it would keep indefinately. Dried yucca fruit was prepared for use by soaking and working in water. An informant denied that it was ever boiled, as reported by Reagan. 91 Gifford 92 reports that, in general, the very ripe fruit was peeled, split, seeded, and the pulp eaten fresh. It was also sun dried and stored. The fruit, if not very

88 Hrdlicka, Medical Observations, p. 257.
89 For the utilization of yucca in the Southwest, see Bell and Castetter, Yucca, Sotol, and Beargrass.

90 Goodwin, Social Divisions, $p .62$.
91 Reagan, Notes, p. 294.
92 Gifford, Apache-PuebIo, p. 94.
ripe, was roasted in ashes, then immersed in water, peeled, seeded, and either eaten or dried and stored. The roots of the Yucca baccata were preferred as a soap over other species of yucca; however, because these roots caused the skin and ejes of some people to swell, they were utilized less than the root's of the bear gras (Nolina microcarpa). Nolina or Yucca baccata roots are still the preferred source of soap on the Fort Apache Reservation.

The seeds of the Yucca baccata were never used. Neither were the blossoms nor the flower stalk used for food. The leaves are split for cordage. This cordage, and that made from the leaves of other yucca species, is still the most commonly used on the Fiort Apache Peservation. Split sections are tied together by square knots to make the desired lengths.

Yucca fruit and juniper berries were pounded together to make a "gravy." Goddard 93 recorded a San Carlos tale in which ripe fruit was boiled and stirred with water, apparently to form a beverage.

Yucca (Other Than Baccata). Yucca elata grows throughout the Fort Apache Reservation at elevations

93 Goddard, San Carlos Texts, pp. 362-64.
below 6,000 feet. The fruit of this species was not used, but the plant was esteemed for other purposes.

The blossoms were utilized for food. They were said to be bitter unless picked by a "Iucky" person who knew the proper time to gather them. They vere boiled, often with a small black seed (unidentified). They were also boiled with fat or with bones. Por storage they were dried on the top of a wickiup and then sacked and kept in a dry place, such as the coiling of the wickiup.

The leaves of Yucca elata vere used for the headshade of the cradleboard and for cordage. They were better suited to the latter purpose than Yucca baccata, for the leaves were longer.

The fruit stalk of Yucca elata was often charred over a fire and eater like sugar cane. A curing rite was described in which the religious practitioner fashioned a peeled yucca stalk into the shape of a short snake, heated it in the iire, and ate it, spitting fragments at the sick person as he chewed.

Yucca elata roots were used for soap, though not so well liked for this purpose as those of Yucca baccata and Nolina microcarpa. The red roots of this species were also used in basket decoration.

Gifford 94 states that the flowers of the "narrowleafed yucca" were eaten boiled by the Cibecue, white Nountain, and both Tonto groups, and that the Northern Tonto, Cibecue, and White Mountain ate the roasted stalk and butt.

Reagan 95 reports that the leaf of the Yucea glauca, as well as that of Yucca baccata, was used for strings, cords, and game counters, and that its roots were pounded for soap. Yucca glauca appears to be the plant identified by Kearney and Peebles ${ }^{96}$ as Yucca elata.

Palmer ${ }^{97}$ states that Yucca augustifolia was used as an emulsion in the cure of insect and snake bites.

Nolina. The young stalks of bear grass (Nolina microcarpa) vere cut in May and June when they had reached a height of about thirty inches. They were placed in the fire for about half an hour, then peeled and eaten. They were said to taste like "some kind of fruit, soft and sticky." This was the only information obtained as to the use of Nolina for food. Gifford ${ }^{98}$

94 Gifford, Apache-Pueblo, p. 94.
95 Reagan, Plants, pp. 147-49.
96 Kearney and Peebles, Flowering Plants, p. 198.
97 Palmer, Customs, p. 164.
98 Gifford, op. cit., p. 13.
states the stalk and butt were eaten by the Cibecue, White Mountain, and both Tonto groups and also 99 notes that the fruit was eaten by the San Carlos, the seeds parched by the White liountain, and the flowers eaten by the Southern Tonto.

Nolina was said to provide "the best soap used." For this the crown and base of the leaves were pounded together and mixed with water.

Spoons were frequently fashioned of bear grass leaves. The leaf had only to be detached from the crown, for the base had a small spoon-like depression. Only dry grass was used for this purpose, because the green grass tasted like soap. Iucca leaves were also used as spoons in this manner. 140ar grass was greatly esteemed as a thatching material for wickiup or ramada and as wrapping material for foods to be transported or stored. The women gathered the plant by severing the crown and leaves from the roots with a sharp rock. Now an axe or a pick is used. Sharpened chisel-sticks such as were used for mescal were ineffective, because the bear grass roots were too tough. The detached plant was carried home intact. For thatching, green grass and dry were equally
good, and a thatch of this material would last ten to fifteen years. The whole temporary cradle-board was made of Nolina leaves.

Sunflowers. Sunflower (Helianthus Sp. $)^{100}$ seeds ripened in the fall. Groups of people established ownership of a stand of sunflowers by tying bunches of heads together before they ripened. When the birds began to flock around them, they were picked.

The person gatherins this plant had a basket hung over his shoulder. A beater, twro feet long with an oval-shaped basket-head about four to six inches wide on the end, was used to knock the seeds from the heads into the basket. At other times the whole heads were picked and sun dried. Water the seeds were shaken loose.

$$
\text { G1fford } 101 \text { states that knives were used by some }
$$

Apache to sever the sunflower heads; the Northern Tonto used an ash-wood knife; the Southern Tonto used a stone knife and a single-bladed hardwood knife six to eight inches long, for severing; the Cibecue used a stone

100 For cultivation of sunflowers, see the section dealing with this plant in the chapter on Agriculture.

101 Gifford, Apache-Pueblo, pp. 95-96.
knife. According to Gifford, 102 the Southern Tonto tied sunflower stems into bundles, dried them, and shook out the seeds; only the San Carlos dried the heads over a fire.

Sunflower seeds were parched in a basket tray. They were ground "just a little bit, not fine." Then they were ground a second time to a fine iheal. Com was then mixed with the sunflower meal and put into hot water. It was eaten not too moist and without salt, as a. pasty bread. An industrious woman could grind and propare such a dish in about an hour. Sometimes com and sunflower meal were boiled with salt into a cereal, "just like oatmeal."

The army scouts, when preparing to leave on an expedition, had their wives grind about twenty-five pounds of sunflower seeds for rations.

Sunflower seeds and corn were ground together into a flour which was eaten by the pinch. Children were not allowed to play or laugh while eating the seeds, for it was believed that children might choke on them.

Another method of eating the seeds was to parch them, then grind them with dried mescal. Ihis mixture

$$
102 \text { Ibid., p. } 96
$$

was said to taste "just like candy."
Palmer 203 states that parchea grass and sunflower seeds were made into flour and prepared either as porridge or shaped into thin cakes and baked in the ashes.

Pinon. The pinon (Pinus edulis and Pinus monophylla) furnished one of the staple foods of the Apache. Pinon was plentiful north of Natanes Rim, but less common on the Graham mountains. 104 Late fall was the season when the nuts ripened. Informants claimed they were harvested from October to as late as December. Large parties, sometimes a whole local group, would leave to gather them in the areas where trees vere bearing.

The nuts were gathered from the ground and shaken or knocked from the trees. They were usually gathered in the cone, unless it was late in the season. Cones were dried or fired to dislodge the seeds. One family expedition was described in which the green cones were roasted in a brush fire, pulled out with a stick, and then pounded between two stones and shaken to free

103 Palmer, Customs, p. 169.
104 Goodwin, Western Apache, p. 157.
the seeds. A labor-saving means of gathering was to rob the caches of rodents in the ground or in the piled brush.

The nuts were eaten raw or were roasted. Pinon nuts were parched with corn and ground into flour which was eaten by the pinch. Gifford 105 states that they were hulled on the metate and winnowed by the Northern Tonto, Cibecue, and White Mountain; these groups and the Southern Tonto, he also reported, made a "butter" of the mashed hulled seeds, while the Tonto groups made a "butter of the whole mashed seeds. Reagan 106 reports that pinon nuts were ground to a flour, hulls and all, and made into soups and also baked like bread cakes. Both the grinding of the hulls and the use in soups or as bread cakes were categorically denied by a Cibecue and a White ilountain informant. The nearest thing to a soup they knew was a mixture of pinon and corn flour cooked into a mush.

Nuts were stored in baskets or pottery jars and also, according to Goodwin, 107 in buckskin sacks.

Pinon pitch was the favorite chewing gum, at

105 Gifford, Apache-Pueblo, p. 13.
106 Reagan, Notes, p. 294.
107 Goodwin, Myths and rales, pp. 54-55.
least among the White Mountain. This pitch was also used to water-proof baskets. Heated pitch, or a heated pitched basket, was applied to the face by some to remove facial hair.

Pinon pitch was gathered in June. This was also the time for gathering pinon pollen, which was often used to supplement the supply of tule pollen. Curtis 108 states that the Apache, probably the White Mountain, made a drink from the green or dried inner bark of the pinon tree.

Walnuts. Walnuts (Juglans sp.) were considered by the cibecue to be better if they fell naturally, but they sometimes climbed trees and shook them loose. 109 Among the White Mountain group the hulls were removed by pounding vith a rock or, according to Gifford, 110 in a bedrock mortar. Then they were washed in a basket in a running stream. Washing was also practiced by the cibecue.

The White Nountain used the juice of walnut hulls "like sheep dip" on their horses and cattle. It was

108 Curtis, North American Indian, I, p. 19.
109 Gifford, Apache-Pueblo, p. 91.
110 Ibid., p. 95.
also considered good for clearing maggots from wounds. One or two tablespoons were administered internally to dogs as a cure for worms.

Walnuts were never boiled, according to informants. They were pulverized and mixed with mescal juice, producing a liquid of a light creamy color, having the consistency of tomato juice. This was said to taste like sweatened milk. It was eaten by dippins com bread into it. Walnuts vere said to be the only nuts eaten with the sweet mescal drink. They were also parched with corn, ground, and eaten by the pinch.

Reagan 111 reports that walnuts were mashed fine, kernels, hulls, and all, then boiled with water. From this a white, milky liquid was filtered and drunk.

Palmer 712 states that valnuts were ground with dried mescal. The inner partition shells were ground In this dish and were said by Palmer to act as an aid to digestion.

Reagan 113 notes that walnut kernels and green corn were mashed together on metates and baked in cake form.

111 Reagan, Notes, p. 292.
112 palmer, Customs, p. 168.
113 Reagan, Plants, pp. 148-49.

Juniper. Juniper (Juniperus sp.) berries were an important food. They were plentiful in the intermediate elevations north of the Natanes Rim. 114 The gathering season extended from October to December.

The berries were picked from the tree when fully ripe or were gathered after they had fallen and dried on the ground. According to informants, only the meat of the berry was used, not the seed, and this was boiled and eaten unseasoned.

Goodvin 115 records that the berries were partialIy dried, boiled until soft, then ground to a pulp on a metate or flat stone. The pulp obtrined was molded into a ball and stored. Palmer 116 states that at times the whole fruit, including the seed, vas pounded and made into bread. One of Goodwin's tales 217 includes an incident in which yellow juniper berries were parched in a basket.

Juniper ashes were mixed with com mush for color and flavor. Particularly favored was the greenish color imparted by the ashes.

114 Goodwin, Western Apache, p. 157.
115 Goodwin, Experiences, I, p. 34.
116 palmer, Customs, p. 169.
117 Goodvin, Myths and Tales, pp. 54-55.

To cure pneumonia juniper branches were heated, placed in a protective wrapping to prevent a burn, and applied to the back of a patient.

Torches viere made of dried juniper bark. The bark was rubbed between the hands until the fibers were separated. A thick strand was produced by twisting. This was then wrapped from top to bottom and tied up and down its length with yucca string. The torch made a. Iight like a small camp fire and would last four or five hours. If it died down, it had only to be shaken to flare anew.

A non-intoxicating, greenish-colored drink was made of juniper berries. The berries were soaked overnight, then pounded with the fruit of Yucca baccata or dried mescal. After mixing with water the seeds and heavy part of the pulp were screened and the fluid drained into vessels. The juniper berries and yucca fruit could also be pounded together to produce "gravy." Juniper berries were also mixed with roasted agave crowns, similar to their use with yucca fruit, to make a beverage.

## Miscellaneous Seeds. Aside from seeds specifi-

 cally treated here, such as pinons, acorns, cactus, and sunflower seeds, the Apache used many additional smallseeds for food. Curtis 118 states that many such seeds were gathered in baskets, ground on a metate, and shaped into an oily ball with the hands. It was said that a Iump twice the size of a fist, when eaten with wild greens, could sustain a man for two days.

Informants mentioned that, in general, the seeds of many grasses and herbs were formerly eaten. Such small seeds have apparently not been gathered during the last ten years and are novi known only to the older people. Specifically mentioned was a two-foot grass, whose stem was aIso used as comb and broom material. This plant Reagan 119 identifies as Bouteloua gracilis Lag. The reddish seeds of a two-foot "feather" grass, possibly the same plant as that identified by Reagan, were ground with corn and eaten.

Reagan 120 names several grasses, the seeds of which were once ground and made into bread. These include, besides Bouteloua gracilis Lag., such grasses as Eriocoma cuspidata Nutt., Sporobolus strictus (Scribn.) Merrill, and Epicompes rigens Benth. The grass seeds

118 Curtis, North American Indian, I, p. 15.
119 Reagan, Plants, p. 155.
120 Ibid., p. 149.
enumerated by Reagan ${ }^{121}$ as being edible, together with seeds from other unnamed bunch grasses, were ground and made into bread. The ground seeds were also inixed with corn meal and water and made into a mush or into a pone which was baked in husks or in ashes.

A number of foods are mentioned in the tales collected by Goodwin: 122 "'iyá aí" seeds were ground and made into a mush and "na djicyu•jer" seeds were parched and ground; ${ }^{123}$ na•ajizba•ye was another edible seed. 124

Hrdlickal ${ }^{125}$ notes two seeds used by the San Carlos. One, called "kloh-tzo," was said to look like rye but to be smaller. It vas a grass which grew in the mountains where pines were found. After being ground, it vies boiled a short time, then eaten with salt, like mush. The other, named "nap-tzi," was also a mountain grass. This was roasted, ground fine, mixed with hot water, and eaten as a. mush.
121. Ibid., pp. 148-49.

122 Goodwin, Myths and Tales, passim.
123 Ibid., pp. 54-55.
124 Ibid., pp. 51-52.
125 Hrdlicka, Medical Observations, p. 259.

Gifford 126 states that chia was basket-parched by the San carlos, Cibecue, and White Nountain, and was eaten dry by all the Western Apache, as well as wet, at least by the cibecue. "It was called "nadiskit" by the Northem Tonto. ${ }^{127}$ Possibly this was a species of Salvia.

Seeds of the devil's claw (Martynia sp.) were cracked and chewed for the juice, which was "just like milk."

Seeds when gathered were shaken into a basket or detached vilth a beater. Women nommally did the gathering, but Goodwin 128 states that boys and girls when courting formerly went off in groups to gather seeds, making a social event of it.

Seeds vere stored in pottery, gourd, ar old
pitched water basket receptacles and cached under ground or in caves and rock shelters. Gifford 129 states that the Cibecue sometimes piled seeds on a cave floor.

Berries and rruits. A plant with red berries

126 Gifford, Apache-Pueb10, p. 14.
127 Ibid. p. 96.
128 Goodwin, Myths and Tales, p. 123 and f.n.
129 Gifford, on. cit., p. 99.
(possibly Rhus trilobata) wias said to grow "everywhere" but to be larger and more abundant at elevations higher than 5,000 feet. The red berry of this plant was gathered in June. It was usually ground, but was sometimes chewed raw for the juice. The seeds were never used. The ground berries were stirred in warm water to make a colored, non-intoxicating drink. A drink tras made by adding dried mescal juice. After American supplies became available, sugar vas often substituted for the mescal juice. The drink, when mixed with mescal, was said to taste like sugared tomatoes and to look like canned tomatoes. The stalks were used for baskets, being split into three sections of else peeled directly of the bark. The pitched water basket was always made of this material, which was also used, though infrequently, for making the round burden baisket. The berry was gathered in sacks and would keep two or three years.

Several references in the literature appear to be made to the above plant. Gifford ${ }^{130}$ states that the San Carlos made a beverage of crushed sumac berries ("sinkoye"). Hrdlicka ${ }^{131}$ reports that a red berry used

130 Gifford, Apache-Pueb10, p. 96.
131 Hralicka, Medical Observations, p. 258.
by the San Carlos vas washied, crushed and dried, ground, stirred with water, and drunk or eaten as thin mush. Palmer 132 notes that "Squaw berries" were washed to get rid of an acid exudation, insects, etc., then dried and pounded for food.

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\text { Palmer } 133 \text { states that cooking and carrying }
$$ baskets were made of the twigs of Rhus aromatica.

A "wild grape" (Vitis arizonica) was picked when ripe and eaten raw. The berry was also pounded, dried on the ground in the sun, and stored in sacks in modern times; it was never stored in a vessel. Another modern usage was to boil the juice from the berries to make wine.

Among the White llountain Apache both wild plums (Prunus Sp.?) and wild Cherries (Prunus virginiana) were eaten raw, though Gifford 134 states that neither was used by the Western Apache. According to Bourke, 135 however, Apache foods included the wild cherry and the wild strawberry (Prageria sp.?).

A six foot shrub was shown near Grasshopper from

132 Palmer, Customs, p. 169.
133 Loc. cit.
134 Gifford, Apache-Pueblo, p. 14.
135 Bourke, on the Border, pp. 129-31.
which brown berries "just like a little apple" were obtrained. These were ground, the seeds discarded, and mixed with mescal juice. The pulp was also eaten raw and was said to make one "fat and happy," though no longer inch used. They were also preserved with or without grinding.

Manzanita (Arctostaphylos pungens) flowers and fruits were used. Gifford 136 states that the Southern Tonto diging stick was made of the wood of manzanita. Hrdlicka 137 notes two berries eaten by the san Carlos. One, Canotia holocantha, was called "sas'-chil," meaning "soft wood." the other was a small, black bercy called "chi-ln-tlézh."

Reagan ${ }^{138}$ states that there were not many berries In the Fort Apache region. These were gathered by the women and usually served raw.

An old Cedar Creek man stated that the Navajo at one time used to bring rugs to the Whiteriver area to trade for "baskets, mescal, and wild berries."

The same man named mescal and venison as his favorite foods, and added that he had never cared much

136 Gifford, Apache-Pueb10, p. 91.
137 Hrdlicka, Medical Observations, p. 258.
138 Reagan, Notes, p. 294.
for berries, though when extremely hungry he had often eaten them.

Greens. The Apache vere fond of greens. Giffordl39 states that 217 the Western Apache ate greens bolled and that the Cibecue and White Mountain also ate them raw. Palmer 140 notes that the white liountain women gathered large baskets of greens daily when in season, primarily species of Amarantus and Cheropodium. Dried mescal was soaked, beaten and added to the greens when they were almost cooked. Salt was added to all green vegetables, but they were never cooked with meat. Formerly they were stone-boiled in baskets. 141

The White Mountain and Cibecue used "wild onions, " "wild potatoes," and "Indian spinach" (Lambsquarter, Chenopodium leptophyllum (Moq.) Nut't. and Chenopodium ineanum Watson). 142 Though Iambsquarter grew wild in abundance, the black seeds were broadcast around the camps so that they mould come up thickly near at hand. The plant is still widely used on the Fort Apache Reservation. It is called "eetón."

139 Gifford, Apache-Pueblo, p. 14.
140 palmer, Customs, pp. 169-70.
141 Ioc. cit.
142 Reagan, Plants, p. 156.

Probably this is the plant mentioned by Hrdlickal43 as used by the San Carlos, who called it "i-tan'," and ate it raw, or chopped up, mixed with a little fat and salt, and boiled.

The Rocky Mountain bee plant (Cleome serrulata) leaves and whole young plant were used as greens by the Carrizo and Cibecue bands. An informant stated it was brought to Cibecue prior to 1900 by Indian Cooley, who obtained seeds from the Carrizo and threw them on a sandy place near Lower Cibecue Mission. The plant has since spread along the roads, but is not abundant. It is not used for dye and was said to have no uso other than for "spinach." The plant is also evident in scattered stands on the road between McNary and Whiteriver. Mr. Schroeder, the forester of the Whiteriver Agency, believed the plant to be a recent introduction. Kearney and Peebles ${ }^{144}$ state that the plant appears to have been introduced into Arizona.

Roots, Fungi, and Miscellaneous. The inner bark of pine (Pinus sp.) was used as a food. 145

143 Hrdlicka, Medical Observations, p. 258.
144 Kearney and Peebles, Flowering Plants, p. 371. 145 Bourke, Apache Campaign, pp. 30-32.

Many varieties of fungi fumnished food, 146 though only corn smut and mushrooms were mentioned by informants.

A White Mountain woman stated that at one time very young and green wild gourds were eaten. A statement by Goodwin, 147 that the nàdìk ${ }_{0} \frac{1}{0}$ sikà. dn' ("Iwild gourd growing people ${ }^{\prime \prime}$ ) were nàmed from the habit of eating wild gourds, indicates that the Tonto possibly once ate gourds. Dr. E. F. Castetter ${ }^{148}$ believes it improbable that wild gourds were ever eaten, as they are very bitter.

A wild gourd (Cucurbita foetidissima) was used "Iike sheep dip." It was mashed, stem, leaves, and roots, and soaked in hot water until soapy. The liquid was then applied to the sores on a horse's back. It was said to sting like turpentine and was never used on humans. Reagan 149 states that the leaves of a gourd which grew on the surface of the ground and which he tentatively identified as Cucurbita perennis Gray was ground and used as a green paint in sand paintings.

146 Curtis, North American Indian, I, p. 19.
147 Goodwin, Western Apache, p. 623.
148 Personal communication.
149 Reagan, Plants, p. 148.

Blossoms of a number of plants were eaten. The use of Yucca elata blossoms has been covered elsewhere. "Wild rose" blossoms were aried or "barbecued" by the White liountain. Though informants denied that pumpkin blossoms were ever eaten, a White Mountain tale in which the mother of Slayer of Monsters sent her daughter-inlaw out to gather "squash" blossoms for boiling indicates that they were once used. 150

The White Nountain stated that from the mountain tops they gathered small "wild potatoes" (Solanum fendleri or Solanum jamesii), which smelled and tasted like the commercial Irish potato. They also gathered "wild onions" (Allium spp.). "Wild tomatoes" (Iycopersicum Sp.?) were found plentifully along the Black River.

For rheumatism and colds the white Mountain fried greasevood in fat until it began to turn green, then rubbed it over the patient.

Hrdlicka" 151 states that "Dickleostemma, var. Bordiaca, Capitata pauciflora," which grew on the San Corlos Reservation, was eaten in the spring. The small blue flower of the plant was eaten raw, and the bulbs were eaten either raw or cooked.

150 Goodwin, Myths and Tales, p. 28.
151 Hrdlicka, Medical Observations, p. 258.

Reagan 152 reports that the dried root of Euphorbia serphyllifolia was preserved in sacks and used, after being cheved, as yeast for the "green corn ash wedding cake." Informants aid not know of this usage.

Bourke 153 states that the bulb of the wila hyacinth (?) was eaten either raw or cooked and tasted like raw chestnuts. Me also noted that the tule (Mule amarilla? -- probably typha sp.) bulb was eaten, being always roasted between hot stones. Bourke 154 believed that tule pollen was an ancient food of the Apache, and that it was offered on sacrificed and used with prayer for this reason. Gifford 155 records that the tips of tule shoots were eaten by the white Mountain and by the Northern Tonto, and that the stem bases were eaten by San Carlos, Cibecue, and White Mountain. The cibecue ate the tule flover buds and the blue-flowered corm raw, and the tule stem bases were eaten by the San Carlos children. 156 Tule (Typha sp.) pollen is still

152 Reagan, Plants, p. 148.
153 Bourke, Medicine Men, p. 520.
154 Ibid., p. 518 et seq.
155 Gifford, Apache-Pueblo, p. 14.
156 Ibid., p. 96.
regularly gathered north of Cibecue and at the swampy lakes in the Mcliary area. June is the gathering season. Because the gathering places are somewhat distant and snakes are reputed to be numerous in the tule areas, many do not gather the pollen but prefer to paj others twenty-five cents or more for a small bottle of it.

Honey. Several Cibecue and White Mountain informants spoke of honey gathering. The oldest stated that the White Nountain were not familiar with honey until after the white Americans arrived.

Only men gathered honey. When wild honey was discovered in a hollow tree, the observer marked it with a pile of rocks. This designation of prior rights would be rospected; if another porson, failing to notice the pile of rocks, cut the tree down, the honey would be divided if the original discoveror claimed it. Formerly the Apache built a fire to smoke the bees out and then detached the comb from the outside of the tree. When metal axes became available, the tree was cut down. The honey vas transported in ordinary or pitched water baskets. It was eaten immediately, not stored.

The chief $0-1$ in the $1890^{\circ}$ s used to harvest the honey systematically from four or five rock hives near the winter camping grounds south of the Salt River. At
one hive he would remove a rock from the sandstone crevice in which the bees inested, dis out the honey, then replace the rock. At another he would make a yucca brush fire to smoke out the bees, placing a rock over the fire so it would burn slowly and make a great deal of smoke.

Honey was also gathered from big black bees (bumble bees?) which made their hives in agave or sotol stalks. The stalks were punctured and then split open to expose the honey. This was rernoved in the form of little lumps of "candy" which wras "sometimes swreet, sometimes not, and tasted like chocolate." It was often eaten on the spot.

Bumble bee honey was gathered from the ground by the Northern Ionto, San Carlos, and Cibecue. 157 when a Northern Tonto stepped on a bumble-bee nest and was stung, he told a chief, who sent men and boys with digging sticks to take the honey. Only the honey was eaten, not the grubs. 158

A sweet substance was sucked from the large red flower of a small herb by the cibecue and White hountain. It was never gathered, but the interior of the

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\begin{aligned}
& 157 \text { Ibid., p. } 10 . \\
& 158 \text { Ibid., p. } 90 .
\end{aligned}
$$

flower was pulled out and sucked where found. Children would hunt for this.

Salt. Salt was gathered by a few volunteers and shared with others upon their return. The Cibecue obtained it from two caves near the Salt River, on the north side. Probably these were the two caves mentioned by Gifford ${ }^{159}$ as being on Salt River near the confluence of the cibectue Creek, where he stated the Southern Tonto obtained it, and near the confluence of the Salt River and Cariizo Creek, where he stated the Cibecue and White Nountain got it.

A Cibecue informant reported that all the Western Apache, but no other people, used the two caves on the Salt River. The salt stalactites were knocked one with a. stone axe or the salt was scraped off into a sack or basket. About fifty pounds was gathered at a time, and this supply was said to last two years. Gifford ${ }^{160}$ states that the stalactites were shot down with arrows by the Cibecue, who also obtained a rediish salt from the cave floor.

The salt was ground on a metate, then moistened

159 Ibid., pp. 96-97.
160 Ioc. cit.
and made into a ball, flattened on one side. It was then placed on grass and dried by the fire. About twenty-four hours were required to harden it.

The San Carlos obtained salt from a cave on the Black River and also at a point about twelve miles east of San Carlos. 161 The Southern Ionto got crystallized salt from the damp soil near the edge of the Little Colorado River. This salt was molded into a cylindrical cake around a stick and carried by yucca cords. The White Mountain obtained crystallized salt on the ground near a salt spring on Carrizo Creek. It was molded around a stick, which was then removed and a carrying rope inserted in the hole. 162

Ritual attended the gathering of salt. A special prayer was said at the cave on the salt River, accompanied by the offering of a red, yellow, blue, white, or black stone. This stone had to be tossed in the cave before entering. An individual dared not enter the cave alone, for it was thought an old man with a dog would appear to unaccompanied persons. At one time the cave was said to contain a footprint of the goddess Changing Woman, which people who went there

161 Gifford, Loc. eit.
162 Ibid., p. 97.
were required to lick.
Bourke ${ }^{163}$ states that the goddess "Ya-yennas ganne," also called "Maria Santissima," was probably the godiess of Salt; that such a goddoss was adored bJ the Zuni; and that the most sacred ceremonies of the Apache ritual were celebrated in caves at the Salt Springs on the Rio Prieto (Salt River). A White Mountain informant on the salt ritual, a Catholic, translated the name Changing Woman as "Our Blessed Hother." Gifford ${ }^{164}$ reports that, when obtaining salt from the Salt River -- Carrizo Creek cave, the Apache prayed to Changing Woman, to her son, and to "the one who made salt." He also stated that timbers were in the cave vhich indicated an old suin.

Salt was occasionally traded by the White Mountain to the IVavajo for blankets and rope.

Salt was sometimes stored in a gourd vessel. The common method, however, was to retain it in ball form. In this form it could be held over a vessel of cooking food and the desired quantity scraped off with a rock.

Comestible Clay. The use of clay is reported

163 Bourke, Religion, p. 446.
164 Gifford, Apache-Pueblo, pp. 96-97.
briefly by Bourke. 165 He states that comestible clay was used only as a condiment to relieve the bitter taste of the wild potato, in the same manner as it was known to the Zuni and Hopi. In the same place he mentioned that clay was scarcely used any loftger by the Navajo.

Gifford ${ }^{166}$ notes that the Southern Tonto goddess, Changing woman, forbade eating clay or other "airt" with the crops she gave mankind.

Condiments (Other Than Salt and Clay). Juniper ashes were mixed in corn meal mush by the White Mountain and the Cibecue to give it a greenish colon and to add flavor. Gifforal 67 states that the Ieaf ash of Yucca baccata was added to maize mush by these people.

The leaves of a two-foot plant with a purple daisy-like flower somewhat resembling the Rocky llountain bee plant were used by the cibecue for seasoning boiled meat. Possibly this plant was a mint. It was said to be "like pepper."

Another plant boiled with meat was also said to

165 Bourke, Medicine Men, p. 540.
166 Gifford, Apache-Pueb10, p. 97.
167 Ibid., p. 15.
season it like "black pepper." Two or three of these plants were boiled and the liquid used for cough medicine. It was taken mixed with water.

Surmary and Conslusions. The amount of wild plant foods utilized fluctuated with the abundance of the agricultural harvests and with the success of hunting and raiding expeditions. Wild plant foods were gathered more intensively if there was a shortage of other foods. A greater use vias made of wild plants by the Northern Tonto, Southem Tonto, and San Carilos groups than by the more agricultural white lhountain and Cibecue groups. Prior to the Arerican occupation, the Western Apache probably depended upon wild plants for approximately forty percent of their food. Whis Itgure is an estimate based upon informant's recollections of the 1870's and traditions of earlier times. Naturally, it would vary considerably from group to group, year to year, and season to season.

From the standpoint of volume used and continuous dependability, mescal was the most important Western Apache wild plant food. The Northern tonto must be excluded from this statement; to these Indians the acorn was a more important food than mescal, which was procured through trade or by long gathering excursions
outside their territony. Among the White Mountain and Gibecue, and probably also the Southern Ionto, the acorn Was a close second to mescal in inportance. The san Carlos made as much, or more, use of mesquite and saguaro fruit as they did of acorns.

In the order of their relative economic importance, wild plant foods used by the White llountain and Cibecue were mescal, acorns, sunflower seeds; other wild seeds and nuts, including pinon and valnut; yucca fruit, priekly pean fruit, juniper berries, mesquite, and saguaro. In addition to these, various roots, greens, and berries were used. Favorite foods, or at least the foods spoken of host ofton, were the niescal and acorn, though sunflower seeds and pinon nuts viere close pehind In favor. Solle foods, such às the saguaro, vere relished, but were more in the nature of seasonal luxuries or occasional foods which provided a change of diet. Juniper berpies, though enjoyed, were something of a. "hard times" staple.

Goodwin 168 estimates that thirty-five to forty percent of all pre-reservation White Mountain food was from wild plants, staples being mescal and acorns (the two most important), sacuaro fruit, mesquite beans,

168 Goodwin, Social Divisions, p. 62.
yucca fruit, sunflower seeds, fruit of the prickly pear, pinon nuts, and juniper berries.

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\text { Opler } 169 \text { estimates that the pro-reservation diet }
$$

of the White Mountain and Cibecue consisted of sixtyfive percent of veretable products, but does not differentiate between wild and cultivated plants.

Bourke, 170 writing undoubtedly of both Ohiricahua and Western Apache, names mescal, yucca fruit, the mesquite bean, "nopal" or Indian fig (cactus fruit), sunflower seeds, several unidentified grass seeds, wild potatoes, wild cherries, and wild strawberries as the principal vila plant foods of the Apache. Of these, he considered mescal the most important. Bourke's observations were made in the eighth and ninth decades of the last century.

In 1890, Palmer ${ }^{171}$ listed the following as White Mountain Apache plant foods: greens (mostly species of Amarantus and Chenopodium), sunflower seeds, grass seeds, mesquito pods, acorns, "squaw berries," juniper borries, mescal, walnuts, and wild potatoes.

169 Opler, Fort Apache Report, p. 35.
170 Bourke, on the Border, pp. 129-31.
171 Palmer, Customs, pp. 169-70.

Reagan, 172 who made his observations in the period 1901-1902, includes walnuts, mesquite beans, mescal, berries, cactus fruit, pinon nuts, jucca fruit, and acorns in the wild plant foods used on the Fort Apache Reservation. In his piants Used by the white Mountain Apache Indians of Arizona, 173 Reagan Iists forty-eight species of wild plants used for food or beverages by the White Mountain and Cibecue Apache. Hrdlicka ${ }^{174}$ in 1908 stated that wild plants used by the San Carlos were cactus seeds, cactus fruits (of which saguaro was the most valuable), mescal, yucca fruit, berries, seeds, acorns (which were but little used), and a few roots, bulbs, and leaves.

Coodvin 175 in 1935 wrote that a 800 a many wild plant foods were still in use among the white mountain Apache, especially acoms and mescal. Whe use of such foods has declined to the point where today (1947) only a few families with a taste for some of the traditional foods make any effort to gathor them. The one wila crop still harvested to any extent is the acorn. Women will

$$
\begin{aligned}
& 172 \text { Reagan, Notes, pp. 292-95. } \\
& 173 \mathrm{pp} \cdot 155-160 . \\
& 174 \text { Hrdlicka, Nedical Observations, pp. 257-59. } \\
& 175 \text { Goodwin, Social Divisions, p. } 64 .
\end{aligned}
$$

gather greens or berries or fruits growing conveniently near at hand, but distant trips requiring overnight camping or expeditions by large parties are made only to the acorn grounds. Even the knowledge of the uses of plants is rapidly being lost. Part of the disuse of wild plants may be attributed to the concentration of population and the restriction of movement enforced by the soldiers when the Apache were being pacified; part to the enforcement of compulsory school attendance, which prevents the former winter migrations; part to an increasing familiarity with and fondness for American foods; and part to removal, through cattle checks, Govemment worlk, and off-reservation jobs, of the necessity for gathering.

Prior to the coming of the white Americans, the Apache appear to have made excellent use of the natural plant resources of their territory. Because of the great ecological diversity of their region, there was a wide variety of plants which matured at different seasons, and in videly separated places. This made the Apache migratory from spring until fall.

## CHAPMER IV

## FOODS

Utensils and Implements. Utensils and implements used in the preparation and consumption of foods by the Western Apache were few and simple.

Water was usually obtained and stored in pitched baskets. Bourke ${ }^{l}$ records the use of cow entrails by the Chiricahua for this purpose. Occasional use was also made of gourds as water containers, or even of deerskin bags, according to informants, though tho last does not seem practicable.

For boiling, plain black pottery, tall in proportion to diameter and pointed at the base, was used. The only decoration was a narrow band of aiagonal indentations an inch or two below the lip of the jar.

Infommants deelared that stone boiline in baskets was practiced only by men on raids and hunting trips, since pottery was too much of an encumbrance to carry along. However, palmer2 states that stone boiling was formerly done and $\operatorname{Smart}^{3}$ reports that he saw no earthen viare among the Tonto, the only utensils used in

1 Bourke, Apache Campaign, p. 100.
2 Palmer, Customs, pp. 169-70.
3 Smart, Tonto, p. 419.
preparing food being "shallow vessels of closely netted straw." Use of pottery was reported among the Tonto by the surviving Oatman firl. 4 there was no stone boiling in skins.

Cooked food was transferred to baskets for serving. The tale of "The Deer Woman" 5 relates that cornineal mush 'was dipped into a basket and boiled deor meat taken from a pot and put in a basket. In former times, corn mush and other foods were eaten from a basket with the fingers or with the base of a beargrass leaf, which served as a spoon.

Informants denied the use of horn for vessels. Goddard, 6 however, records a tale in which an eagle offered a hom vessel of boiled com to a lian.

Small wooden bowls vere made for soups. Soups vere also drunk from gourd dippers.

Basket trays were used for parching grain and seeds. Fast movement prevented burning. Palmer ${ }^{7}$ states that parching trays were thoroughly moistened before being used.

4 Stratton, Captivity, p. 97.
5 Goddard, San Carlos Myths, P. 52.
6 Goddard, White Mountain Myths, p. 133.
7 Palmer, Customs, pp. 169-70.

Metates were not carried on trips. Some were cached in several places in the winter grounds. Small manos were carried on trips to grind seeds. Usually a woman was equipped with but one mano and one metate. The Westem Apache used no stationary grinding bin like that among the Pueblos.

Wooden slewers vere used to hold meat or ears of com over the fire. They were also used to remove meat or dumplings from the pot and to turn food in the coals. Com dumplings were eaten from a small stick. Iwo small sticks were held together in the hand for stirring cooking food. It was necessary to stir with two sticks, for it was believed that the use of only one would cause death to a member of the family.

## Kitchens and Fires. Cooking was by broiling,

 either over open fires, in hot coals or ashes, or on hot rocks; by pit-baking, parching, and boiling.Boiling was done in pottery vessels, except by parties out hunting or on raids, who stone-boiled in baskets. As the Apache were fond of soups, cooking by boiling was a favorite method. According to a White Mountain woman, her people used four stone pot rests, the Chiricahua only three. Gifford ${ }^{8}$ records three

[^52]stones used by the San Carlos, none by the other
Western Apache grouns.
For parching, a basket tray and hot coals were used. Corn cobs were the preferred fuel for charcoal. Gifford ${ }^{9}$ reconds pot-parching among the Southern Tonto.

Pit ovens for green corn were located near the permanent agricultural sites.

In inclement weather cooking was done over a small rock-enclosed fire pit in the center of the wickiup. During good weather it was accomplished outdoors, often within a brush windbreak or under a ramada. Those Apache who today have frame houses, still a minority, usually fumish them with very cheap tin cook stoves. Griddles and Dutch ovens have changed the manner of making bread, but some women still make "ash bread" in hot coals and ashes. Even those families with frame houses and stoves usually move into a wickiup or ramada for the summer season. One worman whose family is fonder than most of the old Indian recipes cooks all her Indian foods in her wickiup or ramada, though she has one of the best-furnished houses on the reservation.

Fire was made with a drill. A stalk of yucca or bear grass as thick as a finger was split and grooved

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9 \text { Ibid., p. } 15 .
$$

on one edge to form the hearth. This was placed on a rock. Juniper bark and grass were shredded between the hands, then placed with a little dust and dirt into the groove of the hearth. The drill consisted of yucca or wood. The end was placed in the bark and earth in the hole of the hearth, and the drill was twirled between the palmis with a strong downvard pressure. Fire making tools were carried in the quiver or in a buckskin bag attached to the back of the belt.

A "strong man" could start a ifre with one twirl of the drill (that is, vithout readjusting the hand position to the top of the drill). After one twirl, the smoking bark could be picked up and blown into flames. Others required as many as six twirls; these would laugh at their Iack of proficiency. As late as the 1890 's, school boys wagered marbles on other objects on how well they could make fire, proficiency being measured by the number of times they had to move their hands back to the top of the drill to twirl it. Grown men wagered belts of cartridges or money on the number of twirls it would take them to make fire. Hough ${ }^{10}$ states that the Apache could make fire within three-fourths of a minute, and adds that Bourke had

10 Hough, Apache and Navaho Fire-Making, p. 585.
stated the Apache could grind out fire in ten seconds. Flint and steel were used for fire-making after the acquisition of metal. This method was often preferred because the materials did not get wot and because a piece of flint, a small bit of file, sponge wood, and juniper bark could easily be carried in a small buckskin bag at the belt. Minder was obtained from the heart of a dead oak. This was compressed in the fingers and held in the left hand next to a piece of flint. Sparks were struck off the flint onto the tinder with steel held in the right hand.

Children's Foods. Children were nursed whenever they cried. There was no apparent embarrassment about nursing in public places. Hrdlickall peports that the Apache baby for the first five or six months received only mother's milk, then a little food. Nursing continued until the child was able to walk or until another pregnancy occurred. Pregnancy, however, did not always cause an interruption of nursing, and on rare occasions a mother nursed both her latest and a previous infant at the same time. Red pepper was placed on the nipple when it was desired to wean a child.

11 Hrdlicka, Medical Observations, pp. 76-77.

It appeared that Apache children, as soon as they were able to eat solid food, were fed the same foods that adults ate. They were at times given tulapai, a mildiy intoxicating corn beer. Indian Service officials were frequently appalled at the heavy, starchy diet given infants. Efforts to promote the use of milk or canned milk for children, or for babies whose mothers were unable to nurse the children, have not met with success except in the cedar creek area. Here a greatiy beloved and respected school teacher induced the Apache to use canned milk in great quantities not only for children but for adults as well. Parents were very indulgent with their children, buying them soda pop and candy at the stores even when they could ill afford it.

Ownership. Food was generelly considered the property of the wife, because she had gathered it or prepared it. A husband could not dispose of wild plant foods without consulting his wife, as he had had little or no part in procuring them. However, he might give away farm produce, for he often participated in the farm work. Neat brought to camp by the husband became the property of both spouses and either could dispose of it without consulting the other. In the husband's absence a wife could have one of his animals slaughtered
without his permission if she needed meat. If he vias at home, she could request him to butcher an animal. 12 Theft was not comon. It was said that only those who were poor stole food. Usually cases of thert involved stealing from a food cache or field. Hen were not inclined to participate in arguments over stolen food, for these were regarded as women's quarrels. Boys who filched products from the fields might be caught by the owmer in the fiold and whipped, or their parents might be told. 13

Social Customs. Formerly the Apache ate whenever they were hungry. There was no set time for meals. Usually hot meals were eaten in the morning and evening. If people became hungry during the dey, they chewred dried berries or mescal or other readily available foods. At the present time meals are prepared in the morning and evening, and 2150 , by many, at midday. Those who work for the government and those who have had close contact with the whites regularly eat a miday meal.

In former times children were said to have eaten apart, while man and wife ate together. Today children

12 Goodwin, Western Apache, p. 334.
13 Ibid., p. 384.
eat with their parents unless there are guests, in which case the children wait and eat what is left. Children are always given as much as they desire of what the family can provide. Stratton 14 states that the Ionto meted out their foods when these were in short supply, and that they vere always meted out to captives. He notes further that the Ionto vere "disDelievers in the propriety of treating female youth to meat."

Meals were eaten in the vickiup during inclement weather. At such times a man and wife would sit together on one side of the fire with the children across from them. If there were many, a third group might be placed to form a triangle around the fire. Meals vere alvays taken outdoors during good weather, sometimes within a windbreak or under a ramada.

Small individual bowls were used for eating soups. Solid foods, such as cornmeal mush, meat, or meat-mush combinations, were dipped with the fingers, from a common basket. Even today food is often eaten from a common vessel, now of metal or crockery. Meat was placed in the mouth and held with one hand while a bite was cut off with a knife. Grease was rubbed from

[^53]the hands on the arms and legs and was believed to impart strength by "feeding" them.

The Westem Apache were a hospitable people. Friends and relatives made frequent visits, and they were welcomed and fed as long as they cared to remain. Even strangers could expect to be well received and to be fed and allowed to spend the night. Goodvin 1.5 describes the great consideration with which guests were received; usually they were spared conversation until they had satisfied their hunger. Bourke 16 notes that scouts, as they prepared their meals, invited neighboring Americans to partake of their food. Palmer ${ }^{17}$ states, "it is always customary for ono who has anything which others have not, to share as long as it lasts," and that the more thrifty found it difficult to accumulate anything because their hungry friends visited them at all hours.

Today the Western Apache do not eat with one another as they once did. Hospitality is not so freely extended. The only occasions on which large numbers of people eat together are the girls' puberty ceremonies,

15 Goodvin, Western Apache, pp. 545-46.
16 Bourke, Apache Campaign, pp. 27-28.
17 Palmer, Customs, p. 168.
at which times the families of the participating girls provide all visitors with food.

> It is uncertain what, if any, indications of appreciation of a meal or of a host's hospitality vere considered proper. Apparently a guest ate as much as he desired, there being no compulsion that he either partake sparingly or consume everything set before him. A Cibecue informant stated that there was no manner of showing appreciation or of expressing thanks. A White Mountain informant (through a woman interpreter) said that thanks was tendered by the expression, "I thank you ever so much."

Since women did the cooking, they also set the food before their husbends, thereby waiting on them to some extent. 18 women took food to men at the sweat bath. Large meetings vere accompanied vith sweat baths and food. 19

There vere special occasions when the Western Apache were expected to provide food. The puborty ceremony, mentioned above, was one. Food was also provided for holpors at planting time. Food had to be provided for all who offered their services upon a

18 Goodwin, Western Apache, p. 335.
19 Coodwin, Myths and Tales, p. 116.
death in the family. Such individuals were feasted again at the first annual anniversary of the death.

## Relative Importance, Preferences, Attitudes.

Food had social and religious significance in the life of the Westem Apache. "Superficial veneration" was accorded mescal, corn, beans, pumpkins, mesquite, yucca, and sunflower. 20 Bands and local groups were sometimes named in accordance with their predominant food. The Cibecue band were often called "com-feeds-the-peoplefolk," the San Carlos "wheat-field-Indian," and the Cherry Creek local group variously "wheat-feeds-the-people-folk," from the wheat they raised, and "meat-feeds-the-people-folk, " because of the great numbers of Iivestock captured from the Mexican settlements, to which they were closer than any other Cibecue group. There was groat stress on diligenco in procuring food supplies. 21 Prestige was acquired from ability to procure food and also from generosity in giving it away. 22 The exchange of food between families of newly-married couples and the ability of a man to

20 Bourke, Religion, pp. 448-49.
21 Goodwin, Myths and Tales, p. 142 .
22 Loc. cit., Western Apache, pp. 542-43.
provide meat for his in-laws were of great importance. 23
A woman sometimes tested her new daughter-in-law by giving her corn to grind. Pailure in such a test might be used as a reason for separation. 24

The Westem Apache belleved that the spirits of the dead attempted to entice the living with food. Once a mortal partook of such food, there could be no return to the land of the living. A witness told of a dying Cedar Creek girl lapsing into a coina in 1948, then reviving long enough to say that she had talked with her dead grandfather, who had wanted her to eat, but "she did not want to eat their food."

Poods contaminated by such animals as bears, coyotes, hawks, and eagles were believed capable of causing ilinoss and death. One man told of an opportunity he had had to attend school at Carlisle in 1893. Many older people urged hinn not to go, saying "Iou'se too small to go; people back there eat all kinds of snakes and fish -- youtll come back and make everybody sick."

The Western Apache evaluation of other peoples was colored by the attitude of such people toward

23 Goodwin, Myths and Tales, pp. 76, 94, 97, et passim.

24 Ibid., p. 108.
native foods and food customs. A man who had been at Fort Apache when negro troops were stationed there was asked how the negro had been regarded. He replied that his people had said, "The nigger is a pretty good friend of the Indian. Some white people are different. Indian like the nigeer, nigger like the Indian. The nigger eats everything; he eats the Indian food and likes it." Informants usually mentioned venison, mescal, and corn as being among the most important and highly favored of the pre-reservation foods, though often they spoke of such delicacies as woodrats, and combination foods prepared with acorns and sunflower seeds and walnuts as favorites.

Iivestock taken in raids on sedentary peoples formerly were an important source of animal food. Horse and burro meat, espec土ally burro, was formerly preferred to beef if the animals were plump. Cozzens 25 observed meat being cut from live burros by the Chiricahua in the belief that meat taken from a live animal was more tender than that from a dead one. Although practically all the meat from game animals vas used, the entrails were especially esteomed. In describing a fight in which Chiricahua women tore

[^54]and scratched at each other, Bourke 26 states, "The entrails were the coveted portions, for the possession of which the more greedy or more muscular fought with frequency." Santee ${ }^{27}$ also notes the Apache fonaness for entrails, describing a feast of them and an affray In which two old mon drew knives over a paunch. In $1892^{28}$ the San Carlos agent wrote, "Brutality in the butchering of beef cattle has been done away with; women are not allowed near the slaughter-house while the butchering is in progress, and the animals' intestines are not permitted to be given to the Indians, but are destroyed." The White llountain still eat entrails of a beef first because they relish these parts most. Santee ${ }^{29}$ states that the Western Apache of thirty years ago had voracious appetites. He observed that they feasted all day and far into the night when meat was made available to them in plenty. Hrdlicka 30 notes that San Carlos school children did not eat immoderately. Workmen who ate at Kinishba in 1939 were
$\qquad$
26 Bourke, Apache Campaign, p. 90.
27 Santee, Apache Land, pp. 2-3.
28 Report, Commissioner of Indian Affairs, 1892, p. 220.

29 Santee, Loc. cit.
30 Hrdlicka, Medical Observations, p. 22.

In no way gluttonous.
Today on the Port Apache Reservation the principal article of food is beef, whenever the Indians can afford it. On the Reservation it is one of the comparatively cheap foods. Beef is sold at Reservation trading posts fifty percent cheaper than at Phoenix or Albuquerque. On the other hand, most canned goods and bulk foods sell for ten to twelve percent highor on the Reservation.

Beer is invariably ordered by the Western Apache In terms of money value rather than by weight. The usual purchase is "fifty cents worth of beef" or "a dollar's worth of beef." It is only rarely that a customer requests a special cut rathor than "beef." ivutton and pork, the latter in the form of chops or bacon, are sola on the neservation, but not in any quantity. Iinned beef and fancy canned meats are purchased by them if they have the money.

They care very little for mutton. All efforts to introduce sheep in the early 1900 's failed, and the Whiteriver Agent/unhappily reported, "They can not be induced to take care of sheep."31 Today the only sheep on the Reservation are those run by white permittees. Part I, pp. $158-59$.

There were perhaps half a dozen goats in 1948.
Aside from beef, the most important item in the modern diet is the wheat flour tortilla. Potatoes are used to some extent, also beans, particulanly camed beans. Western Apaches with very small cash incomes will buy fancy canned fruits, candy, and watermelon at twelve cents a pound. They will pay ten cents a bottle for soda pop, preferably of a red color, which is usually purchased during their shopping trip.

They are not fond of fresh vegetables, though they pick wild greens and use green squash. Few of them care for milk, fresh or camned; in the cedar Creek area, however, the trader sells many cases of evaporated milk, and adults there drink it directly from the can. One man, a cattle owner who had lived in boarding school, liked inik but would not keep a coll because it was "too much bother; people come home tired and late and no milk -- cow run away." one couple who had learned to like milk at school kept a cow for a brief period, but stopped when neighbors taunted them with "trying to be like white people." In still another case a progressive voman with considerable property had kept and milked cows and stated she would do so again; this wo man did not care what others thought and was probably never troubled with reproaches of any kind,
for she was notably independent and also respected as a generous giver of food.

Most elderly people expressed a preference for their former foods -- mescal, acorn, sunflower seed, walnut, yucca fruit, and com $a^{2}$ shes -- over modern American foods. The old chief Baha once spoke with great appreciation of all the new and appetizing foods which the whites had brought, and $R 25$ stated that when the Western Apaches were dependent upon wild foods their diet was often meager and monotonous, but these were exceptional attitudes.

An old scout at East Fork, who for years received the largest government pension on the Fort Apache Feservation and frequently carried several hundred dollars around in his pockets, refused to buy the packaged and easily prepared American foods he could so easily afford. Instead, he made his wife grind corn daily and prepare Apache dishes. This angered her so that she sometimes told other women, "I would like to kill that man."

Upon returning home, a young veteran of the Nev Guinea and Philippine campaigns expressed a great distaste for American foods and made his wife prepare only Indian dishes. This she did, grinding corn on a metate, although she possessed a metal grinder, because "it
tastes better if the iron doesn't touch it." Other young people stated that their favorite dish was boiled meat with acom meal mashed in it. Most had not tasted a great variety of Westem Apache pecipes.

Though the former generosity in giving away food no longer prevails, people with property, particularly cattle, and those steadily employed usually feel an obligation to help support their indigent relatives and in-laws. Employed Indians with good credit at the trading posts are eternally pestered by relatives and friends for permission to charge on their accounts. The pleas will be, "All I want is a little flour," or, "All I want is a little coffee." Some of the traders stated that a large percentage of such charges were paia, not by those who obtained the goods, but by the individuals in whose names the accounts stood.

A young war widow vith four minor children received insurance and pension checks totaling over two hundred dollars a month. Mer local trader stated that her relatives ate up practically all of it each month, leaving her little for personal needs.

Most Western Apache vere said by the Whiteriver home extension agent and by local traders to spend their whole income, no matter what the amount, as soon as they received it. The largest portion was on food,
as would be expected of a people with low income. The trading posts carried many good credit risks for months at a time until cattle checks were distributed. Elderly and middle-aged Indians had an enviable reputation for integrity and dependability with the traders. Wheir word was accepted as a contract. The younger people were not considered so reliable; many were poor credit risks if not deliberate defaulters.

Por a man to have to cook for himself was considered something of a misfortune. Aside from the inconvenience of performing an unaccustoned task, cooking placed a man in the awkward position of doing women's vork, and subjected hin to the pitying fidicule of $h i s$ fellows. At cibecue a number of widowers were in this predicament. One, an elderly scout, had tried repeatedly to find a wife, offering his seventy-five dollar pension to a woman who would foed him and talke care of him, but all had laughingly refused his proposals. The western Apache rarely questioned or quibbled over prices in the trading posts. On one occasion when a man protested that sugar was too expensive, an old Indian clerk rebuked him, saying, "What's a little plece of metal when you can get sugan? Where olse would you get anything so sweet and good for your coffee?"

Miscellaneous Ritual Associated With Foods. Bourke ${ }^{32}$ states that they had a tabu against tasting fish, fish-eating birds, domesticated dogs, and, at times, porcupines and peccaries. Various food tabus and dislikes have been covered in the discussion of particular classes of animals.

Food tabus among the western Apache have changed within historical times. The elk, once a food animal, is now no longer hunted or eaten since a groun of peonle became sick from elk flesh. Fish, once untouchable, are now relished by some of the younger men, though by no means all. Because of the issue of army pork rations in the Seventies and Eighties, the Indians gradually lost their repugnance for pork. Some tabus apparently vere restricted to local groups or families, such as the tabu acainst the bear, whose flesh was eaten by some and refused by others. Goodvin ${ }^{33}$ describes several tabus which had varying force from family to family.

Among these were several which prohibited newlyweds from using certain foods lest their use affect their children unfavorably.

32 Bourke, Gentile Organization, p. 124.
33 Goodwin, Western Apache, p. 330.

Goddard ${ }^{34}$ states that menstruating women could not eat the head or heart of deer, for such an act would make the hunter unable to kill the animal in the ruture. Goodwin 35 writes, "In the old days on the first war party a boy was not allowed to eat the insides of any animal, only the good meat." If the boy ate intestines, it was believed something would happen to him and he woula not be able to travel vell. It may be suspected that this tabu may have been imposed because the viscera were regarded by older hunters as the "good" meat.

Food bitten or even visited by a coyote or a dog was though to give the eater "coyote" sickness. 36 only elderly people among the white Mountain could eat corn which had been chewed by bear, coyote, and predatory birds. It was thought that young people who ate such food would become sterile. For the same reason only the old ate the carcasses of animals which had been killed by predators. Only very old people ate any kind of fetuses, for it was thought that younger people who ate such meat would grow blind when they

$$
34 \text { Goddard, San Carlos Myths, p. } 63 .
$$

35 Goodwin, Experiences, Part I, p. 48.
36 Ibid., Part II, pp. 33-34.
became old. The eating of deer's heads by a young person, it was believed, would be folloved by an outbreak of sores all over his own head.

The cibecue were carerul not to eat corn from a locality in the field where eagles or hawks had eaten their prey. Children were thought to die from this breach.

Goodwin ${ }^{37}$ reports that unmarried girls did not slice meat unless they happened to be orphans. The reason for this restriction was not learned.

Meals and Menus. The Western Apache stated they had no preference for certain foods at cortain periods of the day, comparable to the American preference for bacon and eggs for breakfast or for soup at dinner. Anything available was prepared for the hot meals, and berries or dried foods were eaten at other times.

On the whole, the spring was the time when grass and weed seed's, stored acorns, and jerked meat were eaten, though there might be fresh meat to boil.

During the summer there was green corn, green corn tortillas, beans pumpkins, watermelons, mesquite, acorns, but not much meat.

37 Goodwin, Western Apache, pp. 472-73.

In the fall there was an abundance of acorns and other wild food plants in addition to the harvested crops.

During the winter there was an abundance of mescal and meat. Stored acorns, wialnuts, berries, and corn were also eaten. An attempt was made to have some corn with every meal, or at least once a day. Dried summer berries were also made to last through the winter.

The menu for a typical day might consist of hot corn meal mush in the morning, corn bread and boiled deer meat in the evening, and perhaps snacks of sunflower meal, berries, mescal, corn bread, or liquefied mescal and walnuts during the day. other daily menus described by informants included every native recipe, alone or combined with other foods.

Drinks. Coffee was drunk by practically all Western Apache, young and old, when they were able to obtain it. The army issued coffee as part of the Indian rations in the last century. one oldman recalled when coffee beans were first issued. They were boiled for hours without result, and it was not until a year later that a soldier showed them how to grind and use the beans. Milk was not ofteh used with corfee, and
because the people did not have much sugar, they drank coffee readily without it.

Tea was rarely drunk. An informant could think of only two men, neither of whom drank coffee, who had liked cocoa.

In fomer days milk from the udders of fresh does was cooked, usually in the udders. Goodwin 38 pecords a tale in which a grandmother sucked the milk out of fawns' stomachs when her grandsons brought them from the hunt.

The Western Apache are fond of the white man's intoxicants. An old informant told how, as a sick man fifty years ago, he had visited relatives on the San Carlos Reservation. These had kept him liberally supplied with wiskey to make him Strong," and loaded him down with several bottles for his return trip. The whiskey, he believed, had cured his ilness.

The most common intoxicating drink of the Westem Apache was, and still is, tulapai ("yellow water"), made of corn with frequent additions of such ingredients as wheat, sugar, yeast, and wild roots. other items occasionally added to give "kick" or "medicine" are Copenhagen snuff and canned mincemeats which advertise

[^55]a rum or brandy flavor.
Tulapai is variously termed tesvino or tiswin by neighboring peoples. Informants all claimed that the White Mountain and Cibecue obtained the drink from the Chiricahua, who in turn had received it from the Mexicans. One Cibecue man stated the first Western Apache use of it "must have been 1850, maybe." Hrdlicka ${ }^{39}$ states it was introduced within the memory of white Mountain men of middle age (in 1904) by a fellow tribesman called "Brigham Young," who brought it from the Chiricahua. It is possible that the use of tulapai is older. An old White Mountain informant stated that it was obtained from the Chiricahua and that this story dated back for four or five generations.

A Cibecue informant described the manufacture of tulapai as follows. Corn is soaked for one day, then placed in a gunnysack and hot water poured on it. After two or three days, it sprouts and is ground on a metate. It is then placed in a pot or five-gallon can of water and boiled until the liquid is reduced to within about five inches of the bottom. Water is added. It is then strained, and the corn particles either fed to horses or thrown away. The strained liquid is kept in a vessel

39 Hrdlicka, Method of Preparing Iesvino, pp. 190191.
for one day and then drunk. The Cibecue sometimes add sugar to increase alcoholic content. About one-half inch of the poot of Datura metaloides is invariably added. Another root added by some was not identified, but from the description it was obtained from the salt River valley and from a "four-square cactus." An old root was said to be bigger than the arm or hand, while a young root was as large as a finger. The roots of still another unidentified plant were used in tulapai by some of the cibecue, who learned about this plant, Which had no other use, from the Chiricahua. Two or three roots vere crushed very lightly, then boiled in the arink. The plant was callod "gan (mountain spirit) arrow."

Hrdlicka's ${ }^{40}$ description of Western Apache tulapai is the most complete published. He states that the White Mountain soaked their corn overnight, placed it in a hole in the ground blanketed with yucca leaves, covered it with a gunnysack, and sprinkled it once a day for about a week. By the end of this time the corn had sprouted about two inches. It was then spread on a blanket for one day to dry somewhat, and the next day It was ground, mixed, and kneaded Iike dough. About

[^56]ten pounds of corn dough was mixed in an earthen pot with about four gallons of water. This was stirred, and boilod until reduced to half its original quantity. While the liquid was cooking, roots of Datura metaloides were added. After the first boiling, water was added to replace that lost through evaporation; the new liquid was again boiled and reduced by half. It was then strained through a perforated can, cooled until lukewarm, and poured into a pot which was never washed and was used for no other purpose. Coarsely ground wheat was added and allowed to float on top. In about eighteen hours it was ready to drink, and if not consumed in a. short time, it would soon take on a strong and acid taste.

Reagan 41 mentions in his description of tulapai that after the first boiling of several hours, the corn mash was strained and recrushed on the metates, then retumed to the liquid for reboiling. At the end of this time it vas set aside to ferment for from sixteen to twenty-four hours. This recrushing process was confirmed 15 y a white mountain voman, who stated that the second boiling continued for only about half an hour.

This same woman stated that "real" tulapai was

41 Reagan, Notes, p. 298.
not intoxicating but a nutritious com-food beverage, that it was made intoxicating by the addition of sugar, raisins, prunes, and yeast. She also stated that the Apache of the East Fork area no longer used Datura root in their tulapai.

Besides Datura metaloides, Reagan 42 states that various perennial plants and roots were added to tulapai, including that of the Euphonbia semphyllifolia Pers., the root-bark of the "Iignum-vitae" tree, 43 some "Ioco weed" (not Datura, which is in the same place given separate mention), the peyote bean, and the juice of Datura metaloides or the powdered root of the plant. Inquiries falled to confirm that the peyote button or any part of a cactus plant, except possibly the roots, had ever been used in tulapei or that the Gibecue or White mountain had ever used peyote.

The bad effects of tulapai drinking are described at length by Reagan. 44 Hrdlicka ${ }^{45}$ states that the effects of tulapai might induce vomiting and produce

42 Reagan, plants, p. 151.
43 This is doubtful according to Dr. E. F. Castetter, personal communication.

$$
44 \text { Reagan, op. cit., pp. 151-52. }
$$

45 Hrdlicka, Medical Observations, p. 177.
headache and weakness for half a day. He saw nursing infants that became ill from the milk of mothers who had been drinking, On the Fort Apache Reservation today tulapai drinking is recognized by both whites and Indians as economically wasteful and as a cause of most of the quarrels resulting in bodily injury.

Summary and Conclusions. The Western Apache were catholic in their food tastes. They liked a variety of foods, a mixed diet composed of meat, agricultural products, and wild plants. They were so fond of all these three classes of food that they missed any type when it was not available. Although no type of food was strongly favored over another, meat must be Iisted first among their food preferences, with agricultural. products a close second, and wild plant foods third. Food preparation was comparatively simple. The dome-shaped oven, batteries of metates, and elaborate bread recipes of the Pueblo were lacking. Even the pit ovens were constructed on a simpler principle. Western Apache techniques of food preparation, though adequate, lacked the refinements and elaborations of more sedentary societies.

The former foods have been partially replaced by American foods obtained from the traders. Women
prefer the easily prepared canned and packaged store foods over the laboriously gathered and prepared traitional foods.

## CHAPTER V

## CONCLUSIONS

I. CULTURAL POSITION OF THE WESTERN APACHE

## IN THE SOUTHIWEST

Distributional studies in the Southvest and over a wider area have been made by Spier, 1 Beals, 2 Hill, 3 and Gifford. 4 Gifford made an analysis of representative Southwestern groups in which 2,990 traits were considered. In this study he used only one informant per group in most cases and recorded only information derived from informants. Though the limitations undor which Gifford worked necessarily affected the completeness of his recordings, they are relied upon heavily in these conclusions.

Traits presented here are classified in terms of non-agricultural and agricultural. These are in turn subdivided into groups of traits which appear to be universal to the Southwest, those which have wide distribution, and those which appear to be common only to the

1 Spier, Havasupai.
2 Beals, Comparative Ethnology.
3 Hill, Agricultural Methods.
4 Gifford, Apache-Pueblo.

Western Apache and limited groups. Traits which appear to be unique to the Western Apache and traits not present among the Western Apache are listed at the end of both the non-agricultural and agricultural sections. In compiling these distributions, Gifford was followed closely. It should be emphasized that many of his traits listed as Southwest universals are found widely distributed in North America, and are therefore of limited diagnostic value. The selection of other traits was arbitrary and the indicated distribution is only a sampling. Even where an attempt was made to completely cover the literature -- in the area of agriculture - the data was so incomplete as to give the appearance of a very scattered and haphazard distribution. If information had been complete, many traits here listed would no doubt be seen to have a much wider and more continuous distribution than is indicated.

The following non-agricultural traits were listed by Gifford ${ }^{5}$ as Southwest Universals. It will be readily apparent that many are widespread throughout North America. Others have a distribution extending outside the limits of the Southwest.

[^57]Stalking game
Stick twisted
in fur to exbract rodent
from burrow
Surround method
in communal
hunting
Slain animal
skinned lying
Turkey vulture not eaten
teat sliced and dried

Dried venison
pulverized
farrow extracted
Hawks killed
Ph ale fentulchos 2 lucked

Skinning by
cutting down
polly
tide soaked
before de-
pairing
Scraper drawn edgewise in dehairing hide

| Hide over leaned- | Hardwood digging |
| :--- | :--- |
| over pole in de- | stick for bulbs |
| hairing | Dicing stick 18 |
| Dehaired hide | to 36 inches |
| softened with | long and lo 2 |
| brains and | inches thick |
| marrow | Spanish bayonet |
| Hide twisted to | yucca fruit |
| express water | eaten |
| and to soften | Tuna (prickly |
| Rawhide used | pear) eaten |
| Self bow | fresh |
| One-piece | to eat boiled |
| arrow without | Snow used for |
| foreshaft or | drinking and |
| head | cooking |
| One-piece arrow | Kitchen outside |
| of willow | house in summer |
| One-piece arrow  <br> feathered Meat roasted on <br> Arrow feather- coals <br> ing radial lieat boiled <br> Arrows three- Boiling in clay <br> feathered pot <br> Hide wristguard Simple fire drill <br> Quiver open Dead wood for <br> skinned and fire <br> Buckskin belt Dead wood for fire |  |
| broken over stone |  |

6 Gifford, Apache-Pueblo, pp. 190-191.

Hair washed with yucca suds

Cordage made by men

Cooking by women

Coloring dressed skin

Rectangular
type (back-
forth) mutate ${ }^{9}$

Pack strap for carrying burden

Cordage of sinew

Women own household utensils?

Quiver of mountain lion hide ${ }^{8}$

Nietate set up so that it slopes away at an angles

Hide pack strap
Some personal property of deceased destroyed

Fire to render rood flexible 8

Sling 8
Muller meant for two hands 9

Brush of grass tied in the middle ${ }^{9}$

Probable Southwest Universals. The following
traits have wide distribution in the Southwest, but are not recorded for all groups. Nevertheless, they may be listed as probable Southwest universals.

Again it should be emphasized that many, if not most, of these traits are not limited to the southwest.

[^58]Food stirred with more than one stick ${ }^{10}$

Nountain sheep hunted with circumspection 14

Care used in handling of food in order to avoid famine or loss of hunting luck 11

Use of Datural2
Blood sausage cooked in entrails ${ }^{13}$

10 Navajo: Hill, Agricultural Methods, p. I77; Fr. Fathers, Ethologic Dictionary, pp. 218-19. Zuni: Cushing, Zuni Breadstuffs, p. I7. Maricopa: Spier, Yuman Tribes, Plate XIV.

11 Navajo: Hill, Agricultural Methods, p. 143. Zuni: Cushing, Zuni Breadstuffs, p. $5 \overline{9}$ et seq. Hopi: Simmons, Sun Chief,p.52. San Juan: parsons, Social Organization, p.134. Cahita: Beals, Contemporary Culture, p. 13. Jicarilla: Opler, Summary of Jicarilla Apache, p. 207. Mescalero: Hoijer, Thiricahua and Mescalero, p. 217.

12 Navajo: Hill, personal communication. Hopi: Whiting, Ethnobotany, p. 31. Yavapai: Gifford, Northeastern Yavapai, p. 261; Southeastern Yavapai, p. 341. Iramicopa and Lower Colorado Yumans: Spier, Gultural Relations, p. 21.

13 Navajo: Bailey, Navaho Foods, p. 284. Hopi:
Beaglehole, Hopi Hunting, p. 11. Zuni: Cushing, Zuni Breadstuff's, $\overline{p p} .559-60$. Santa Ana: White, Santa Ana, P.294. Blackfoot: Wissler, Material Culture, p. $\overline{25}$.

14 Navajo: Hill, personal communication.
Maricopa: Spier, Yuman Tribes, pp. 69-71. Pima-Papago: Castetter, Pima and Papago, pp. 67-68. Yaqui: Beals, Contemporary culture, p.I4.

Use of mask disguise in hunting 15

Pire drive 16
Running down of deer and antelope by men afootl7

Chute and pound 18

Deadfall trap 19

15 Navajo: Hill, Agricultural Methods, pp. 12334. Hopi: Hough, Hopi Indian Collection, p. 285. Yavapai: Gifford, Southerstern Yavapai, pp. 215-16; Northeastern Yavapai, pp. 264-65. Havasupai: Spier, Havasupai, p. 110. Maricopa: Spier, Yuman Iribes, p. 69. Walapai: Kroeber, Walapai, pp. 61-62. Paviotso: Lowie, Shoshonean Ethnography, p. 197.

16 Navajo: Hill, Agricultural Methods, p. 97.
Hopi: Beaglehole, Hopi Hunting, p. I2. Yavapai:
Gifford, Southeastem Yavapai, p. 217; Northeastern
Yavapai, $\overline{p p .265-66 \text {. Havasupai: Spier, Havasupai, }}$ p. 110.

17 Navajo: Hill, Agricultural Methods, p. 97.
Hopi: Beaglehole, Hopi Hunting, p. 4. Northeastern Yavapai: Gifford, Northeastern Yavapai, p. 264.
Paviotso: Lowie, Shoshonean Ethnography, p. 197.
18 Navajo: Hill, Agricultural Methods, pp. 168-
70. Northeastern Yavapai: Gifford, Nortneastern Yavapai, p. 266. Walapai: Kroeber, Walapai, pp. 62-64. Havasupai: Spier, Havasupai, p. 113.

19 Navajo: Hill, Agricultural Methods, p. 185. Northeastern Yavapai: Gifford, Northeastern Yavapai,
p. 265. Havasupa1: Spier, Havasupai, p. 110 Paiute: Lowie, Shoshonean Ethnography, p. 196.

Driving game toward am-
bushed hunters20
Color-direction symbolism 23

Fetuses tabu to young only ${ }^{26}$

Dog tracking of wounded animals 21

Last antelope released ${ }^{24}$

Niud and grass plug for storage pot27

Continence before hunt22 Hunters purify by washing and sweating 25

Pollen used ceremonially ${ }^{28,29}$

20 Navajo: Hill, Agricultural Methods, pp. 97, 121. Southeastern Yavapai: Gifford, Southeastern Yavapai, p. 217. Havasupai: Spier, Havasupai, p. 114. Walapai: Kroeber, Walapai, p. 63. Wind River Shoshone, Paviotso, Moapa: Lowie, Shoshonean Ethnography, pp. 215-16.

21 Navajo: Hill, Agricultural Methods, p. 145 et seq. Hopi: Hough, Hopi Indian Collection, p. 285;
Titiev, Old Oraibi, p. I88. Crow and Shoshone: Bourke, Sacred Hunts, P. 367 . Paviotso: Iowie, Shoshonean Ethnography, p. 197. Gosiute: Chamberlin, Ethno-Botany, pp. 335-36. Walapai: Kroeber, Walapai, p. $\overline{61 .}$

22 Navajo: Hill, personal communication, Hopi: Beaglehole, Hopi Hunting, p. 10. Northeastern Yavapai: Gifford, Northeastern Yavapai, p. 264. Havasupai: Spier, Havasupai, p. $1 \overline{10 \text {. Maricopa: Spier, Yuman Tribes, }}$ p. 70 .

23 Navajo: Hill, personal communication. Hopi: Whiting, Ethnobotany, p. 45. Pima-Papago: Spier, Cultural Relations, $p .21$.

24 Navajo and Southern Ute: Gifford, Apache-
Pueblo, p. 9.
25 Navajo and Pueblo: Loc. cit.
26 Pueblo and Papago: Ibid., p. 10.
27 Pueblo and Papago: Ibid., P. I6.
28 A11 Apache groups: Gifford, Apache-Pueb10, p. 193.
29 Hill, Agricultural Nethods, pp. 98-99.

Arrowshaft
painted near
base 30,31
Turkey feathers on arrows 30,32

Hawk feathers
on arrows ${ }^{30,32}$
Cordage
twisted on
thigh ${ }^{3}$

Quiver carried on back 30,33

Wood getting by women ${ }^{34}$

Non-Universal but Widespread Traits. The following traits are not universal to the Southwest, but are nevertheless widespread. All occur among the Western Apache.
Inner bark of trees eaten 35
Seed beater ${ }^{36}$

Sunflower seeds eaten ${ }^{37}$

30 All Apache groups: Gifford, Apache-Pueblo, p. 193.
31. Franciscan Fathers, Ethnologic Dictionary, p. 319.

32 Ibid., p. 318.
33 Ibid., p. 321.
34 Gifford, Apache-Puebio, p. 193.
35 Navajo: Hill, personal communication. Zuni: Cushing, Zuni Breadstuffs, pp. 224-25. Klamath: Spier, Klamath, Pp. 165-66.

36 Nescalero and Chiricahua: Gifford, ApachePueblo, p. 11. Havasupai: Spier, Havasupai, pp. 107108. Walapai: Kroeber, Walapai, p. 49. Shoshonean and Kaibab: Lowie, Shoshonean Ethnography, p. 201.

37 Navajo: Hill, personal communication. Zuni: Cushing, Zuni Breadstuffs, p. 252 et seq. Santa Clara: Hill, Field Notes. Yavapai: Gifford, Southeastern Yavapai, p. 212. Havasupai: Spier, Havasupai, p. 116. Thoapa: Dowie, Shoshonean Ethnography, p. 201. Ute: Ibid., p. 203.

| Stone club and | Fish not eaten 39 | Arrow points |
| :--- | :--- | :--- |
| handle encased | Rath serrated |  |
| in ravide38 | habit skin | sides 40 | | Mountain lion | Agave eaten 43 |
| :--- | :--- | | Mesquite eaten 43 |
| :--- |
| not eaten 42 |

Western Apache Traits with Restricted Distribution
in the Southwest. Traits common to the Western Apache, Navajo, Pima-Papago, and Yuman were:

38 Navajo: Hill, Navaho Warfare, p. 11. Southeastern Yavapai: Giffora, Southeastern Yavapai, p. 225. Blackfoot: Wissler, Material Culture, pp. 163-64.

39 Navajo: Hill, personal communication. Isleta: Parsons, Isleta, p. 21I. Yavapai: Gifford, Southeastem Yavapai, p. 205; Northeastern Yavapai, p. 255. Havasupai: Spier, Havasupai, p. $1 \overline{13 . ~ W a l a p a i: ~ K r o e b e r, ~}$ Walapai, p. 67.

40 Pueblo, Papago: Gifford, Apache-Pueblo, p. 31.
41 Navajo and Pueblo: Ibid., p. 10.
42 Navajo, Santa Ana, Papago: Ibid., P. 9. Western Yavapai: Gifford, Northeastern Yavapai, 11. 267. Mescalero: Castatter and opler, Ethnobiology of $\frac{\text { the }}{\text { Spier, }}$ Chiricahua and Mescalero, p. 25. Havasupai: Spier, Havasupai, $\bar{p}$. II 2.

43 All peoples to whom the plant was available. Gifford, Apache-Pueblo, p. 93.

Reverse hide on carcass of deer, pat it, and ask for good fortune 44

Dreams while on hunt indicated good or bad fortune 45

Arrows with
transverse sticks for birds 46

Basket boiling ${ }^{47}$

The following traits were shared by the Western
Apache, Pima-Papago, and Yuman.

Restriction on boy eating his first killis

Quail eggs
tabu to
joung only 49

Mescal knife, all stone, chop-ping-knife shape 50

44 Navajo: Hill, Agricultural Methods, p. 188. Southeastern Yavapai: Gifford, Southeastern Yavapai, p. 215.

45 Navajo: Hill, Agricultural Methods, p. 109. Havasupai: Spier, Havasupai, p. 109.

46 Navajo: Hill, Agricultural Methods, p. 175. Yavapai: Gifford, Southeastern Yavanai, p. 224; North$\frac{\text { eastern }}{p .64 .} \frac{\text { Yavapai }}{}$ p. 286 . Walapai: Kroeber, Walapai,

47 Western Apache: Gifford, Apache-Pueblo, $p$. 15. All non-Pueblo peoples of the southwest: Spier, personal communication.

48 Pima: Russell, pima, p. 191. Naricopa: Spier, Yuman Tribes, pp. 65-66.

49 Papago: Gifford, Apache-Pueblo, p. 10.
50 Western Apache: Gifford, Apache-Pueblo, p. 26. Iuman and Pima-Papago: Hill, personal communication.

Traits common to the Western Apache, Navajo,
and Pueblo were the following.

Legs rubbed
after meals 51
Sounds of antmails heard while in hunting, camp good luck $^{54}$

Tabu on killing
snakes 52
Weapons leaned against something in hunt corral 55

Sacred hide froin unwounded animal 53

Animal hunting partners 56

Western Apache traits found among the Pueblo
were:

Hunter smokes
in the cardinal directions when he sees deer ${ }^{57}$

Hunting powers
from birds and
beasts of prey y 58

Tanged base
arrow heads 59
Quiver of cased
skin 60

51 Navajo: Hill, Agricultural Methods, p. 178.
Beaglehole, Notes, Hopi: Beaglehole, Notes, p. 61.

52 Navajo: Hill, Agricultural Methods, p. 176. Isleta: Parsons, Isleta, Pp. 338-39.

53 Navajo: Hill, Agricultural Methods, pp. 13233. Hopi: Beaglehole, Hopi Hunting, pp. 6-7.

54 Navajo: Hill, personal communication. Hopi: Beaglehole, Hopi Hunting, p. 6.

55 Navajo: Hill, Agricultural Methods, p. 103.
56 Navajo: Hill, Agricultural Methods, p. 102. Meres: White, Notes on Ethnozoology, p. 231.

57 Islets: Parsons, Isleta, p. 337.
58 Pueblo: Parsons, Pueblo Indian Religion, I, p. 187. Santa Ana: White, Santa Ana, p. 283.

59 San Ildefonso: Gifford, Apache-Pueblo, p. 30 .
60 Zuni: Gifford, Apache-Pueblo, p. 32.

Agave or yucca needle with
attached fibers for thread 61

Returning hunter could be relieved of meat by those who saw him coming 62

Traits common to the Western Apache and the PimaPapago Were:

Fasting before hunt $63^{\circ}$

Sexual intercourse tabu during mescal cooking 66

Dead return in the form of owls ${ }^{64}$

Mescal pads
folded 67
Granary on
platform 69

Elliptical-stone mescal knife, retouched 65

Coiled storage baskets 68

61 Hopi, Santa Ana: Gifford, Apache-Pueblo, p. 27.

62 Hopi: Titiev, old Opaibi, p. 191.
63 Papago: Gifford, Apache-Pueblo, p. 8.
64 Papago: Parsons, Pueblo Indian Religion, II,
p. 993.

65 Papago: Gifford, Apache-Pueb1o, p. 26.
66 Papago: Ibid., p. 12.
67 Loo. cit.
68 Ibid., p. 16.
69 Loo. cit.

Yunnan traits recorded also for Western Apache
included:

Mourning com-
memoration 70
Honey gathered
from nest of a ground insect 73

Caterpillar
eaten 77

Mescal knife,
not hatchet?
Tortoise eaten ${ }^{74}$
Rabbits shot, not clubbed ${ }^{7} 5$

Chuckwalla eaten 78

Honey gathered.
from nests in flower stalks
of agave 72
Prayers to sun in hunting 76
cooking in
barrel cactus 79

70 Yuman: Spier, Cultural Relations, p. 19.
71 Maricopa: Spier, Yuman Tribes, p. 55.
72 Havasupai: Spier, Havasupai, p. 108; Naricopa: Spier, Yuman Tribes, p. 73.

73 Southeastern Yavapai: Gifford, Southeastern Yavapai, p. 217.

74 Northeastern and Western Yavapai: Gifford, Northeastern Yavapai, p. 268; Naricopa, Papago, and Yavapai: Spier, human Tribes, p. 73.

$$
75 \text { Havasupai: Spier, Havasupai, p. } 112 .
$$

76 Havasupai: Ibid., pp. 109-110.
77 Southeastern Yavapai: Gifford, Southeastern Yavapai, p. 217; Northeastern and Western Yavapai: Gifford, Northeaster Yavapai, p. 268. Maricopa: Spier, Yuman Tribes, p. 72 .

78 Northeastern and Western Yavapai: Gifford, Northeastern Yavapai, p. 268.

79 Western Apache: Gifford, Apache-Pueblo, p. 14. Yuman: Spier, personal communication.

## Southern Athapascan Universals. The following

traits are universal among the Southern Athapascan groups. They were also found by Gifford amons one or more non-Athapascan groups.

Eagle not
eaten 80
Spanish bajonet yucca root stalk used for soap 80

Brush enclosure or windbreak for surmer kitchen 80

Bowstring of sinew 80

Two-ply
bowstring 80
Turquoise used ${ }^{80}$

Pad of vegetable material in bedding 80

House left in wife's possession at divorce 80

Spanish bayonet
yucca fruit cooked in coals 80

Pinon seeds
gathered from the ground 80

Avil for skin sewing 80

One-piece wood-
en arrow with sharpened point for small game 80

Quiver of openskinned, sewn mountain lion hide 80

Hard-soled
moccasins 80
Pottery made only by women 80

Spanish bayonet Jucca fruit dried and stored after seeds discarded80
"Grass," etc. seeds eaten 80

Hide dehaired with cannonbone tool 80

Standard usage
of their feathers on arrovis 80

Red paint and fat protect from chappinco 80

Pack strap across
shoulder and chest 80

Undestroyed property inhenited after cieath of owner 80

80 Southern Athapascan universals according to Gifford, Apache-Pueblo, p. 192.

Windbreak of
branches 81,82
Children taken
as prisoners
of viar81,81

Horizontal new moon believed to signify drought81,83

Captive children adopted81,84

Vertical new moon believed to signify rain 81,83

Probable Southern Athapascan Universals. The traits listed below are probably universal among the Southern Athapascans.

Tobacco smoked
as part of religious preparation for the hunt 85

Sling as a
boy's toy 85
Robe, shavl, or cape of hide with hair on 85

Spines brushed
off cactus 85,86
Flint flaking with stone by blow 85

Pigment kept
in skin sack 85,86
House building
by women 85,86

Stone pestle 85
One-piece arrows
of wood other
than willow 85,86
Buzzer toy 85,86
House of de-
ceased burned 85,86
Skin bedding owned by women 85

81 Recorded for all Apache groups. Gifford, Apache-Pueblo, p. 193.

82 Hill, Agricultural Methods, p. 102.
83 Ibid., p. 71.
84 Hill, Navaho Warfare, P. 15.
85 All Apache groups: Gifford, Apache-Pueb10,
p. 193.

86 Navajo: Hill, personal commication.

Bird atop cap
as ceremonial
headdress87,96
Food stirred clockwise 90,96

Globular storage
pit constricted
at neck, dried
by ilre, juniper
bark linings, and oriented on near-by
ob ject? I, 96

Turquolissee unsseid by or foom mnaile, white sttoones our
shell foore
female 883,,9363
Religiouuss prearc-
titioneress mazy:
pass hunnttiinig:
ritual ttoo amyy
individuuaz1l, vuss -
ually foom puays92,96
Meat nott tialkcem on hunt 93,9963

Wcod from house of dead person or struck by lightning or touched by bear not used89,96

Grown boys accompanied hunting parties as apprentices, performing camp chores 94,96

Fire under roosting turkey 95,96

87 Hill, Agriculturall Mienthoods, p. 153.
88 Ibid., p. 164 et poassis:irm..
89 Ibid., p. 177.
90 Loc. cit.
91 Ibid., pp. 42-43.
92 Ibid., p. 100.
93 Ibid., p. 101.
94 Ibid., p. 100.
95 Ibid., p. 174.
96 Iraits recorded fopm Whesstern Apache in field
work.

Traits Unique to Western Apache in the Southwest.
The following traits are not repronted for Southwestern groups other than the Westem Apsache ard may possibly be unique to these people.

Bow strapped to outside of quiver by buckskin straps ${ }^{97}$

Acom bread 100
Huge twined
basket for cave
storage 103

Concave ammowhead base form war and hunt 998

Scratching
stick during mescal
cooking 101
Burden baskett
in cache pit 7104

Tongs to lift out boiling meat99
"'Grass' etc." seeds gathered with a stone knifoloz

Traits Not Recorded for Weestern Apache -- Non-
Agricultural. The traits listed below are not rocorded for the Western Apache.

98 Ibid., p. 31.
99 Ibid., p. 26.
100 Ibid., p. 12.
101 Loc. cit.
102 Ibid., p. 14.
103 Ibid., p. 16.
104 Ioc. cit.

$\qquad$
105 Chiricahua, Llanero:: Gifford, Apache-Pueblo, p. 5.

106 Hopi, Papago: Gificord, Apache-Pueblo, p. 5.
107 Ilanero: Ibid., p. 6.
108 Navajo, Eastern and Southern Apache, Pueblo, Papago: Ibia., pp. 6-7.

109 Navajo, Llanero, Zumi, Santa Ana: Ibid.,
p. 7 .

110 Navajo, Zuni, San Illdeffonso, Papago: Ibid., p. 8.

111 Pueblo: Ibia., p. ©.
112 Pueblo: IOC. cit.
113 Papago: Ioc. cit.
114 Pueblo: Ioc. cit.
115 Pueblo: Loc. cit.
116 Papago: Loc. cit.
117 Lipan, Sante Ana, San Ildefonso: Ioc. cit.
118 Navajo, Chiricahua, Southern Ute, Hopi, San Ildefonso: Ibid., p. 26.

Turtle or tortoise shell cup119

Bow string of vegetable fiber 122

Boomerang for rabbits 127

Natural shell
as container 130

Wooden platter for meat 120

Arrows multiple pointed 123

Buckskin
quiver 125
Wooden mortar128
Wooden spoon or
ladle131

Self bow painted 121

Bone arrowheads 124

Quiven at side, under arm in battle 126

Animal hair swab
for imbibing
liquídl29

119 Navajo, all Apache except Western Apache, Southern Ute: Gifford, Apache-Pueb10, p. 26.

120 Navajo, Chiricahua, Mescalero, Iipan, Southem Ute, Zuni: Loc. cit.

121 Chiricahua, Iipan, Santa Ana, San Ildefonso:
Ibid., p. 29.
122 Chiricahua, Southern Ute, Zuni, Papago:
Ibid., p. 30 .
123 Navajo, Zuni: Ioc. cit.
124 Jicarilla: Loc. ejt.
125 Iipan, Jicarilla, Pueblo: Ibid., p. 32.
126 Navajo, Apache except Western, Pueblo, Papago:
Loc. cit.
127 Chiricahua, Southern Ute, Pueblo: Ibid., p. 33.
128 Chiricahua, Papago: Ibia., p. 25.
129 Navajo, Mescalero, San IIdefonso, Papago:
Loc. cit.
130 Mescalero, Lipan, San Ildefonso: Ibid., p. 26.
131 Navajo, Mescaloro, İpan, Pueblo, Papago:
Ioc. cit.
citㄹㄹ

$\qquad$ .834 $102+3+8$ Whan $\qquad$ $\underline{y}=$

Stone cupl32
Crooked (U-
ended) stick
for beating
trees 135
Mesquite boiled
and fermented 138
Skin cover for storage pot141

Two sticks for handling hot stones 133

Acorns roasted on coals 136

Narrow leafed yucea fruit eaten 139

Prayer sticks (as distinct from plumes) 134

Spanish bayonet flowers and flower stalk eaten 137

Fire on top of oven 140

In contrast to non-agricultural features, agricultural traits have a more limited distribution. Widespread Southwest Agricultural Iraits. Those Western Apache traits which were widely distributed among other Southestern farming groups are as follows.

132 Navajo, Chiricahua, Fapago: Gifford, Loc. cit.
133 Navajo, Ohiricahua, Hopi, San Ildefonso: Ibid., p. 25.

134 Pueblo: Ibid., p. 76.
135 Santa Ana, San IIdefonso: Ibid., p. 11.
136 Lipan, Santa Ana: Loc. cit.
137 Southern Ute, Jicarilla, Zuni, Santa Ana, Papago: Ibid., p. 13.

138 Mescalero, Papago: Ibid., p. 15.
139 Ilavajo, Chiricahua, Southern Ute, Hopi, Zuni: Ibid., p. 13.

140 Navajo, Souther Ute, Pueblo, Papago: Ibid., p. 15 .

141 Chiricahua and Mescalero: Ibid., p. 16.

Sunflowers cur-
tivated 142
Gourds cultrated 145

Tobacco cultvated 143

Green corn
roasted in pit oven 146

Cotton cultvated144

Twinned or branched ears of corn feared 147

142 Navajo: Bourke, Folk Foods, p. 41. Hopi: Force, Hopi Agriculture, p. $\overline{394}$. Santa Clara: Hill, Field Notes. Southeastern Yavapai: Gifford, Southeast$\frac{\text { en }}{105}$ Yavapai, p. 212. Havasupai: Spier, Havasupai, p. 105. Mohave: Castetter, Yuman Agriculture, ms.

143 Hopi: Whiting, Ethnobotany, $p, 16$. Havasupai: Spier, Havasupai, p. 105: Yavapai: Gifford, Northeaster Yavapai, p. 264 . Pima-Papago: Castetter, Pima and Papago, p.109.

144 Hopi: Forde, Hopi Agriculture, p. 394. Havasupai: Spier, Havasupai, p. 105 . Santa Clara: Hill, Field Notes. Pima-Papago: Castetter, Pima and Papago, p. 106.

145 Navajo: Hill, Agricultural Methods, pp. 47 48. Hopi: Force, Hopi Agriculture,,$\frac{391 .}{39}$ Santa Clara: Hill, Field Notes. Pima-Papago: Pima and Papa-
go, pp. $107-108$.

146 Navajo: Hill, personal communication. Zuni: Cushing, Zuni Breadstuffs, p. 204 et seq. Hopi: Whiting, Ethnobotany, p. 16. Havasupai: spier, Havasupai, p. 104. Northeastern Yavapai: Gifford, Northeastern Yavapai, p. 263. Maricopa: Spier, Human Tribes, p. 63. Mescalero: Castetter and Opler, Ethnobiology of the Chiricahua and Mescalero Apache, p. 29.

147 Navajo: Hill, personal communication. Santa Clara: Hill, Field Notes. Pima: Castetter, Pima and Papago, p. 229.

Rituals, prayers, and songs for rain 148

Communal planting of corn; exchange of work; workers fedl5l

Tobacco considered injurious and prohibited to young men 154

Canal irrigation (some
post European) 149
Planting by watching sun 152

Planting time from observation of vegetation 155

Colors of com planted separate$1 y^{150}$

Tabu on sexual
intercourse in
a. com field 153

Tabu on menstruating women in
a field 156

148 Navajo: Hill, Agricultural Methods, p. 184.
Hopi: Forde, Hopi Agriculture, p. 399. Havasupai:
Spier, Havasupai, p. 288. Naricopa: Spier, Yuman Rribes, p. 251. Pima-Papago: Castetter, Pima and Papago, pp. 222-224.

149 Navajo: Hill, Agricultural Methods, p. 183. Salado Pueblo, Zuni, and Acoma: Reagan, Cliff Dwellers of Arizona, $\rho .296$; Parsons, pueblo Indian Religion, II, p. 1117. Pima-Papago: Castetter, pima and papago, p. 156 et sec. Shivwits: Lowie, Shoshonean theorraphy, p. 2000. Havasupai: Spier, Havasupai, pp. 101-102.

150 Navajo: Hill, Agricultural Methods, p. 30. Hopi: Simmons, Sun Chief, p. 229. Havasupai: Spier, Havasupai, p. 103. Pima-Papago: Castetter, Pima and Papago, 186.

151 Navajo: Hill, Agricultural Methods, p. 28.
Hopi: Titiev, OId Oraibi, p. 184. Pima-Papago: Castetter, Pima and Paoago; p, 152.

152 vavajo: Hill, Agricultural Methods, p. 26.
Hopi: Forde, Hopi Agriculture, p. 384 et seq. PimaPapago: Castetter, pima and Papago, pp. $1 \overline{43-44 .}$

153 Hopi: Simmons, Sun Chief, p. 230. Navajo: Hill, personal communication.

154 Pime-Papago: Castetter, Pima and Papago, p. 218.
155 Pima-Papago: Ibid., p. 147. Navajo: Hill, personal commication. Maricopa: Spier, Iuman Tribes, Pp. 61-62.

156 IVavajo: Hill, Agricultural Methods, pp. 5556. Yuman: Castetter, Yuman Agriculture, ms.

Western Apache Acriculltiural Traits With Restricted Distribution in the Southwest. Agricultural traits shared by the Western Appache and the Pueblo are:

Prayer sticks planted in field to prevent
flood -157
Planters work
barefooted 160

| Eagle, hawk, | Distance race |
| :--- | :--- |
| turkey, road | to make sun |
| runner, but | move more |
| never owl, | slowly 159 |
| feathers |  |
| planted in corr- | Female inner- |
| hers of fieeldsi58 | itance of land 61 |
| Clan owned |  |
| lands l62 |  |

Clan owned lands 162

Western Apache and Pima-Papago agricultural
traits are listed below.
Smoke from weed Ashes sprinkled Soaking of
fires to drive
off grass-
hoppers 163
on vines for
squash buys 164
seeds to aid
sprouting 165

157 Hano: Forde, Hopi Agriculture, p. 396.
plant plumes.) (Apache plant plumes.)

158 Zuni: Bourke, Sacred Hunts, p. 359.
159 Hop i: Beaglehole, Notes, p. 40.
160 Hopi: Ibid., p. 39.
161 Hopi, Zuni: Force, Hopi Agriculture, pp. 367, 383.

162 Hop 1: Forde, Hopi Agriculture, passim.
163 Castetter, Pima and Papago, p. I76.
164 Ibid., p. 177.
165 Ibid., p. 155.

| "Flatheaded corn" | Pumpkins placed | Martymia cul- |
| :--- | :--- | :--- |
| (or "female corn"), on stone or | tivatedl68 |  |
| ears that are flat- brush to keep |  |  |
| tened and somimes dry when irri- | Women's respon- |  |
| split at top, | sibility to |  |
| highly regardedl66 gating 167 | harvest169 |  | |  | Pumpkin seeds <br> dried for cos |
| :--- | :--- |

Western Apache agricultural traits shared by the Navajo are:

Corn colors associated with

Chewing and
Prayers of evil sexl71
spitting of or jealous per-

Two seed corn first hail son could damage stones to stop cropl73 ears from one hail172

Inheritance of stalk pre-

Pield boundaries land usage, and forredク74 located by rights to rearrow shoot 175 claim from squatters 176

$$
\begin{aligned}
& 166 \text { Castetter, Pima and Papaso, pp. 87-88. } \\
& 167 \text { Ibid., p. } 171 . \\
& 168 \text { Ibid., p. } 113 . \\
& 169 \text { Ibid., p. } 180 . \\
& 170 \text { Gifford, Apache-Pueblo, p. 20. } \\
& 171 \text { Hill, Agricultural Methods, p. } 26 . \\
& 172 \text { Ibid., p. } 61 . \\
& 173 \text { Ibid., p. } 71 . \\
& 174 \text { Ibid., p. } 27 . \\
& 175 \text { Ibid., p. } 20 . \\
& 176 \text { Ibid., p. } 22 .
\end{aligned}
$$

```
Stalks of corn
wIth ritual seed
laid down in a
field and remain-
ing corn piled on
them durin
harvesting I7%
Pumpkin seeds
parched and
ground into
Ilour182
Ceremonies to
remove wormsl85
Corn cobs ground
up and used for
flour in times
of faminel88
Stalks of corn with ritual seed laid down in a field and remaining corn piled on them during
Pumpkin seeds parched and ground into
Ceremonies to remove worms 185
Corn cobs ground up and used for of famine 188
```

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177 Hill, Agrioultural Methods, pp. 28 and 39-40.
178 Ibid., p. 26.
179 IbId., p. 46.
180 Ibia., p. 37.
181 Ibid., pp. 60-61.
182 Ioid., p. 47.
183 Ibid., p. 46.
184 Ibid., p. 38.
185 Ibia., pp. 58-59.
186 Ib1d., pp. 55-56.
187 Ibid., p. 27.
188 Ibia., p. 46.
189 Ibid., p. 45.
```

Kernels scraped off cob when first formed, then mashed and boiledl90

Comn chewed or otherwise touched by coyote or bear believed to cause illness and not eaten195

Belief that too many seeds in a hole would crowd each other199

Green maize mush cooked in husks in earth oven 203

Thinned corrn
sprouts bosiled
as greens 1197
Globular sitor-
age pit restricted ait
neck, driezd by
fire, cedar bark
linings 193
Melons thimmed to four or five plants in $1 a$ cluster 196

Corn clusters
thinned by pulling weakestz 200

Elk skin containers for corn in caches 192

Corn threshed by flail in a pit194

Exposed roots re-coveredl97

Helical planting, clockwise 198

Irrigation by women 201

Planting during waxing or full moon 202

190 Hill , Agricultural Methods, p. 46 .
191 Ibjd. $p .45$.
192 Ibid., pp. $43-44$.
193 Ibia., Pp. 4z-43.
194 Ibia., p. 41.
195 Ibia., P. 38.
196 Ibia., p. 37.
197 Loc. cit.
198 Ibid., pp. 29-30.
199 Ibid., p. 35.
200 Tbid., p. 37 .
201 Gifford, Apache-Puebolo, 10. 17.
202 Ibid., p. 18.
203 Ibid., p. 19.

One trait was shared by the Western Apache and
Mescalero.

> Cricket closely
> associated with
> agriculture;
> prayers to
> cricket204

Agricultural Traits Unique to Western Apache In The Southwest. 205 Western Apache agricultural traits not recorded among other groups are listed below. The apparent uniqueness of some of these may bo due to lack of data on other groups.

Tabu against the Women "chiefs" or planting of crops by those who have been struck by lightning or bitten by a snake; also a limited tabu against such people irrigating

Entering another's field between time crops started to grow and harvest prohibited
leaders to organize faming and gathering activities among the women

Plants soaked with seeds to produce, by contagious magic, more ears

Corn near spot where eagle or hawk had eaten its prey not used

Agricultural ritual in possession of wromen

Plants soaked vith seeds to poison rodents

Agricultural ritual perfomed for pay

Field not entered for four days after damage by flood or hail

[^59]Obsidian stones at corners of field to ware off lightning

Corn not planted in a fleld
struck by
lightning
None struck by lightning could
participate in
pit-baking of
corn

Mraits Not Recorded for Western
Apache. The following agricultural traits were not recorded for the western Apache.

Some ceremonies:
first fruits ${ }^{206}$.
Some ceremonies: harvest207

All families
Hand watering
Stick with
from pots209 footrest210

Angle hoe212
Sweet corn213 type") 211

Pop corn214

206 Mescalero, Papago: Gifford, Apache-Pueblo,
p. 76.

207 liescalero, Papago: Loc. cit.
208 Western Navajo, Pueblo: Ibid., p. 16.
209 Navajo, Zuni, San IIdefonso: Gifford, ApachePueblo, p. 17.

210 Navajo, Pueblo: Loc, cit.
211 Mavajo, Hopi, San Ildefonso, Papago: Loc. cit.
212 Zuni, Papago: Loc. cit.
213 Navajo, Pueblo: Ibid., p. 18.
214 Navajo, San Ildefonso: Ioc. cit.


215 Hopi, Zuni: Gifford, Loc. cit.
216 Pueblo, Papago: Loc. cit.
217 Papago: Loc. cit.
218 Pueblo: Loc. cit.
219 Chiricahua, Mescalero, Lipan, Pueblo, Papago:
Loc. cit.
220 Navajo, Santa Ana: Loc. cit.
221 Santa Ana: Ibid., p. 19.
222 Mescalero, Zuni: Loc. cit.
223 IVavajo, PuebIo: Ioc. cit.
224 Hopi, Santa Ana, Papago: Loc. cit.
225 Papago: Loc. cit.
226 Navajo, Zuni: Ibid., p. 20.
227 Pueblo: Loc. cit.
228 Mescalero, Iipan, Pueblo: Ioc. cit.

Eagles caged or
kept captive229
Grinders sing together232

Earth hilled up around com

Netate set in house permainently 230

Others sing for grinders23;3

Com used to manufacture aye234

Battery of metates for coarse and fine mea1231

Holes filled shallowly after planting

Ritual or prrayer
in the plainting
of beans2335
The following inferences relating to the cultural position of the Westem Aparche in the Southwest may be drawn from the above data. The non-agricultural aspects of food economy afrili. te the Westem Apache more closely with the Westem IRancheria236 and Basin peoples than with the Pueblo. Whis is exemplified in their more extensive use of willd plants and game, in the use of the seed beater, anca in pit baking and seed parching techniques of food prepparation.

[^60]In traits associated with hunting, the Western Apache share many elements witih the Navajo and other Southern Athapascans. Ceneral Athapascan traits are the use of a corral windbreak lby hunting parties, dreams indicating good or bad fortune, cries of animals bringing luck or indicating direction of game, proprietary hunting rituals passed on by relisious practitioners for pay, and the performanice of canp chores by grow-boy apprentices.

Possible influences from tribes to the west and south are to be seen in the restriction on mountain sheep hunting and the use of stheep pelts. The circumspection surrounding the huntimg of sheep becomes stronger as one soes from the Mpache te the iliricopa and Pima-Papago and on to the Waqui. Iorn vessels were not reported. Westorn Apache, Papago, and Yavapai used the tortoise for medicinal purposes and made no use of the sholls (except niedicinally of the lavapai), though surrounding peoples appear to have used the shells. The wostern Apache used a wife, rather than a hatchet, for trimming mescal, sseemingly a trait shared only with the Maricopa and Papaso. The idea of the mourning ceremony appears to have beon adopted in a very mimor vay from the Iunans and reworked into the Apache parttern of payment in food
for services or favors performeed. Among the Western Apache the moumers are fed by the bereaved family when they arxive to offer sympathy cand help, and the same moumners must be fed again on the first anniversapy of the death.

Trapping and snaring tecchniques vere weakly developed throughout the Southwesst, but in all this region such techniques are particularlly lacking among the Western Apache. The throwing stick for rakits was also absent in this tribe.

The problem of the origin of the Western Apache agricultural complex is difficult. It is possible that they brought agriculture with them into east-central Arizona or that they took it over from the salado Pueblo peoples who once inhabited the area. $23 \%$

Comparative ethologicall material would indicate that the Western Apache derived their agriculture from the llavajo or from the Southem Athapascan agricultural complex which was at one time continuous from the Navajo country to the Gila, including the upper tributaries of the Gila. Historical evidence is cited in the chapter on Agriculture. Additional evildence indicates a vell developed agriculture among the northem Navajo and

[^61]Apache groups -- probably Jicarilla and groups later destrojed or amalgamated with thee Jicarilla -- in northem New Mexico and adjacent Colorardo two hundred to two hundred and fifty Jears ago.2388. Agriculture diminished in importance among the Southem Athapascans as groups were displaced under comanche and other pressures. It is possible that, as the Mescallero and Warm Springs Chiricahua acquired horses, incoreasing dependence upon buffalo hunting and excursions and raids upon the spanish and Mexican settlements led theem to abandon agricultural activities; agriculture them persisted only in the isolated country of the Navajo and the comparatively horseless Western Apache. Ethmological material also appears to indicate some Pima-Mapago contacts and some Pueblo contacts which may date back to the origin of the Western Apache agriculturall complez but are probably more recent.

Western Apache agricultural traits which appear to derive from Navajo or from a source common to both are: corn colors associated witth sex; chewing and spitting of first hail stones to stop hail; prayers of evil or jealous person believerd to damage crop; piling

238 Hill, Some $\frac{\text { Navajo }}{\text { Aftultural }}$ Changes, passim; Thomas, After Coronado, pp. 17-21, 27.
of corn harvest on ritual seed; location of field boundaries by arrom shoot; com pollen believed to tum into cut worms if not shaken from the plants; corn hit by lightning not eaten; stones throwm ha ni wht watchers into field to frighten animals; ceremonies to remove worms; tebu on pregmant vomon ün a fiela; soaking of seods with drought-resistant pllants; corn touched or contaminated by bear or cojote not usec; Helical planting.

One trait, the associatiion of the cricket with agriculture, Iinks the Mescalero and the Western Apache.

Pueblo resemblances relpate the Western Apache so specifically to neighboring Pueblos that the traits seem to be special borrovings mather than developments from a general Pueblo agricultural complex. Western Apache traits which appear to be Hopi are: distance race to make sun move more slowiy, planters work barefooted, female inheritance of Iland, clan-owned lands, and prayer plumes planted in fileld to avert flood (Hano). Zuni traits shared by the Apache are: female inheritance of land; and eagle, hawk, turkey, road runner, but never owl, feathers planted in corners of fields. Some Western Apache trailts indicate diffusion from or to the Pima. Among thesse are: high regard for "flat-hesded" com, use of weeds smoke to drive grass-
hoppers from a field, sprinkling of ashes on plants to drive off insects, soaking of seeds to aid sprouting, use of pumpkin seeds for cosmetic grease, and the cultivation of Martynia.

In several respects the Western Apache differ from their neighbors. In the shouthwest they were almost unique, at least within historic times, in that woinen conducted most of the agricultural activities. The reason for this was probably that agriculture was not the principal base of subsistemce, hunting requiring much more of a man's energies than among other Southwestern groups. Other distinctive features viere the proprietary agricultural ritualls, exercised for pay, and an excessive fean of the contaminating influences of lightning, predatory birds, and some animals on crops or farm lands.

In Western Apache agriculture there was a lack of any ritual connected with beams, possibly indicating their late introduction as a cmop plant. Iess use was made of the pumpkin than in neilghooring agricultural Groups. Food preparation was on the whole simpler (at least as it concerns agricultumal products) than among other agricultural peoples of the Southwest. The domed oven, hominy, and wafer bread were lacling. Several factors make it hazardous to attempt to
place the western Apache procissely in their Southwest cultural setting. Among these are the incompleteness of the record, the historical displacerents of the Westem Apache, and the doubtruz antiquity of many traits, particularly those relsating to the use of food plants and certain agriculturall technicues. Such evidence as there is wowl d appear to indicate a Navajo derivation of Apache hunting amd agricultural complexes or, perhaps, a general Southerm Athapascan origin of these complexes for both the Western Apache and Navajo. Definite contacts with Pueblo, and Pime, and Yuman peoples are indicated, but thesse appear to have been of only secondary importance in their influence on westerth Apache subsistence economy.

## II. GEMIRAL SSUMMARY

> Many of the conclusions arrived at in this
dissertation have already been stated in detail at the end of each chapter dealing with acriculture, hunting, gathering, and foods. These willl be briefly summarized here.

The Western Apache have included agriculture as a part of their subsistence economy for over two hundred years, its impontance varying from sroup to group. It was practically negligible amonis the Northem Tonto, of
considerable importance to the Southern Fonto and San Carlos, and, during the periodl just prior to the American occupation, furnished approximately twenty-five percent of the subsistence of the White Mountain and Cibecue.

The origin of Western Apache agriculture is highly problematical. Evidencie would indicate that it was derived either from a once widespread southern Athapascan agricultural complex or specifically from the Navajo, which it closely ressembles. Whatever the origin, accretions were made through contacts in trade and war with neighboring peoples: Pueb10, pima, Yumans, and Mexicans.

Principal crop plants weme corn, pumpkins, beans, and wheat. Of these, corn and pumpkins wiore planted for over two hundred years, beans at: least one hundred and fifty, and wheat ninety. Minor crops occasionally planted or broadcast were the suanflover, gourds, devil's claw, tobacco, lambsquarter, amd possibly cotton. Corn may be said to have been the omly crop of major importance.

Agriculture played a significant role in social values and attitudes. Farm lamdis gave added economic security and prestige to their owners. Landless people worked on the farms of chiefs anid "riek men," thereby
building up a patron-client relationship.
Women performed the creater part of the agricultural tasks, since much of the time and energies of the men were expended in hunting amd raiding. However, then assisted in these labors when they were available, and In some groups the heavy labor of clearing land and planting was recognized as properly pertaining to men. Women were recognized as betterc farmers. Doth men and women possessed proprietary agriculturel ritual which was at times performed for pay..

Agriculture did not force a sedentary life upon the Western Apache. Crops were phantec and thereafter given a minimal amount of care while groups migrated to wild plant gathering grounds.

In the period immediatelly preceding the advent of American troops, agriculturo appears to have been in a state of static balance with gathering and hunting. Evidence does not indicate that there was any shift underway in the direction of a greater dependence upon agriculture. The Western Apache vere apparently well satisfied with their divers subsistence and seminomadic way of life.

Approximately thirty-five percent of White Mountain and cibecue food was meat. Among the other groups, especially the Northern Tonto, meat formed a sreater
proportion of the diet. In their order of importance, meat foods were large game, decer being outstanding $2 y$ important; small çame, principaily rodents; and the livestock taken in raids on Spanish and Mexican settlements.

Hunting carried with it considerable prestige value. All men hunted, but sortre were of outstanding skill or possessed proprietary hunting ritual which brought them social and economilc benefits.

Attitudes toward foods have been in process of change. Elk, once an esteemed game animal, has become tabued within the last forty years because of an outbreak of sickness following the eating of elk. Fish, once tabued, is slowly being accopted as an edible food.

Before the coming of the Arericens about forty percent of White Mountain and cibecue foods were from vild plants. Staples, in order of importance, were mescal, acorn (of first importance among the Northern Tonto), sunflower seeds, other fild seeds and nuts (including pinon and walnut), yrucca fruit, prickly pear fruit, juniper berries, fresquite, and saguaro.

In order of quantitative importance, wild plants rank first among the Western Apsache foods, thon meat, with agricultural products last. Their preferences for
staple foods vere, in order, vienison, other meat, corn, mescal and acorns, sunflower sceeds, and pinon nuts.

A great dislocation in economic life accompanied the establishment of the Apachce Reservation. Ifunting and gathering ceased to have their former importance and today fumish but a negligible fraction of Western Apache subsistence. Agricultumal activity has fluctuated with the policies of agents, opportunities for off-reservation employment, ancd governient relief efforts. The introduction of cattile breoding has fumished a source of food and a cash income. Beef has suppianted venison as the favorite food amd today constitutes perhaps fifty percent of the Western Apache diet. White flour, purchased at the triading posts, has replaced cornmeal in the cereal portion of the diet. Fresh plant foods are little ussed.
Probably the most signimicant environmental
factor affecting Western Apaohe economy was the great ecological diversity of the Apache habitat. The western Apache occupied a territory varying in elevation from 2,000 to 11,000 foet and if vegetation froin tall cactus to spruce. Within the general area itself there was great diversification rathor than gradual change, for it was broken into deep vallleys and high ranges. This environment provided a vidle variety of plant
products, growing at different seasons of the year. An opportunity was thus offered f"or the fairly continuous exploitation, from spring to auttumn, of a series of wild plant products ripening at stageered intervals. It was an opportunity which, when thaken, forced a continual series of moves over most of the growing season.

With reference to farming opportunities the white Mountain and Cibecue were perhaps more favored than other groups by a suitable combilnation of irrigable terrain and climate. However, agricultural opportunities vere available to all. Mimor variations of elevation and terrain caused diffferences in planting and harvest times in order to awoid frosts. In only a few areas of exceptionally favomable rainfall, such as Forestale, was agriculture without impigation attempted and the benefit of underground sseepage utilized.

Variations in hunting and gathering opportunities were probably not as limiting im their effects as, those in agricultural opportunity, form the range of most bands included a wide variety off life zones, and the Apache migrated to favorable areas rather than depending upon their own immediate neilghborhoods. However, the Northern Ionto, who IIved far fron the best agave areas, were forced to obtain the ir mescal either by Iong gathering cxpeditions of thmough trade with more
fortunately situated bands to the south; actually they placed a greater dependence upron other foods, such as acoms. Foods such as saguaro fruit and nesquite beans, which grew-in the lower elevations, were used to a greater extent by the San carlos than by the more northerly groups who had to treavel further to obtain them.

In former times the Westtern Apache made a reasonably full use of their environmental resources and possibilities. Most edible plants and animals were utilized. Two notable exceptions in the animal world were bear and fish. Bear were hunted and eaten, but not by ali, and with ritual ilmitations. Fish, although abundant in the streams flowing through the Apache territory, were completely ignored. Scme of the canines and folines were not eaten by all groups, and centain birds were shunned by all. The Western Apache did not cultivate their territory intemsively, though it was climatically better suited to frarming than most areas of the Southwest.

After Iivestock had beem introduced into the New World by the whites, the Westemn Apache failed to accept domestic animals oxcept as beassts to be kept temporarily until needed, then slaughtered.. Even today most of the Apache who orn cattle are not triue stock breeders. A
minority have become successful grovers; most leave their animals in the care of government employees and collect a semi-annurl check from the sales.

Advantage has never beem fully taken of the farming opportunities offered by the Fort Apache Reservation. The greater papt of the Iand developed Iies fallow each year. Modern American scientiffic techniques of farming have not been widely adopted.

Gathering has practically ceased with the restrictions imposed upon the former seasonal mifrations by compulsory school attendance. Game is no longer abundant.

Considering the culturall possibilities and Iimitations of both the pre-American and the post- American periods, the Western Apache were actually making a more complete use of their natural environment prior to the coming of the whites than they have since.

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[^52]:    8 Gifford, Apache-Pueblo, p. 15.

[^53]:    14 Stratton, Captivity, p. 97.

[^54]:    25 Cozzens, The Marvelous Country, p. 121.

[^55]:    38 Goodwin, Myths and Tales, p. 41.

[^56]:    40 Hrdlicka, Ioc. cit.

[^57]:    5 Gifford's investigations covered the Navajo, all Apache groups, the Southern Ute, Hopi (Walpi), Zuni, Santa Ana, and San Ildefonso.

[^58]:    7 Gifford, Apache-PuebIo, pp. 190-91.
    8 Not present in Southern Ute.
    9 Not present in Lipan.

[^59]:    204 Castetter and Opler, Ethnobiology of the Chiricahua and Mescalero Apache, p. 129.

    205 Iraits recorded in this dissertation.

[^60]:    229 Mescalero, Lipan, Chïricahua, Southern Ute, Pueblo: Gifford, Apache-Pueblo," p. 20.

    230 Pueblo: Ibid., p. 224.
    231 Pueblo: Loc. cit.
    232 Pueblo: Ibid., p. 25.
    233 Navajo, Pueblo: Eorc. cit.
    234 Hopi: Whiting, Ethmobotany, p. 27.
    235 Navajo: Hill, Agricultural Methods, p. 35. 236 spier, Problems Arissing, p. 214.

[^61]:    237 See the Summary and Conclusions of the chapter on Agriculturo.

