

UNIVERSITY OF CALIFORNIA PUBLICATIONS
IN
AMERICAN ARCHAEOLOGY AND ETHNOLOGY

Vol. 8, No. 4, pp. 187-234, Pl. 20

August 7, 1908

THE CULTURE OF THE LUISEÑO INDIANS

BY

PHILIP STEDMAN SPARKMAN

BERKELEY
THE UNIVERSITY PRESS

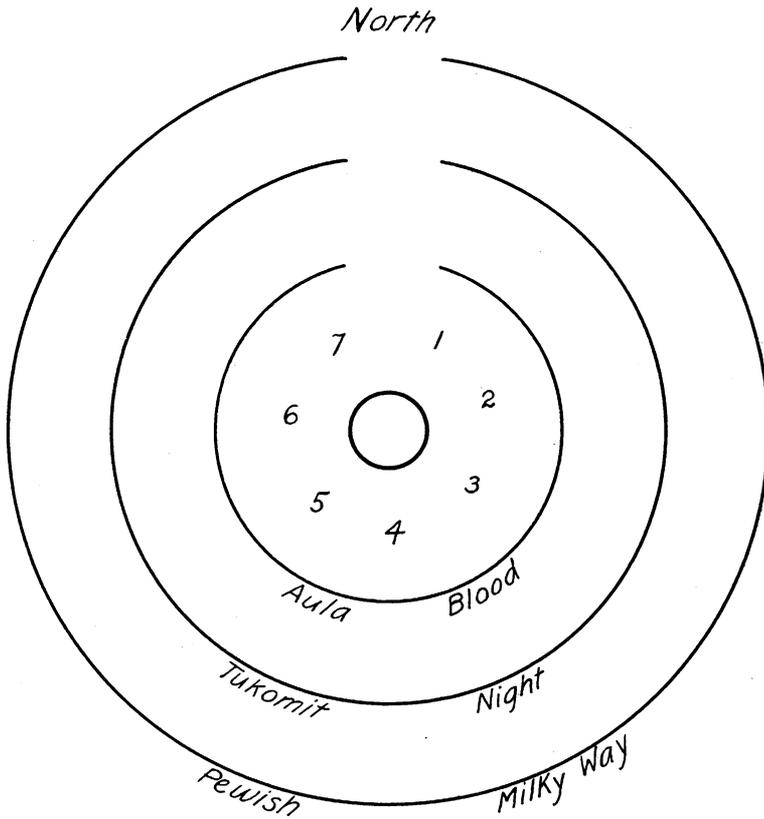
UNIVERSITY OF CALIFORNIA PUBLICATIONS
DEPARTMENT OF ANTHROPOLOGY

The following publications dealing with archaeological and ethnological subjects issued under the direction of the Department of Anthropology are sent in exchange for the publications of anthropological departments and museums, and for journals devoted to general anthropology or to archaeology and ethnology. They are for sale at the prices stated, which include postage or express charges. Exchanges should be directed to The Exchange Department, University Library, Berkeley, California, U. S. A. All orders and remittances should be addressed to the University Press.

AMERICAN ARCHAEOLOGY AND ETHNOLOGY. (Octavo).

Cited as Univ. Calif. Publ. Am. Arch. Ethn.

- | | | | |
|---------|--------|--|----------------------------|
| Vol. 1. | No. 1. | Life and Culture of the Hupa, by Pliny Earle Goddard.
Pages 88, Plates 30, September, 1903 | Price, \$1.25 |
| | No. 2. | Hupa Texts, by Pliny Earle Goddard. Pages 290, March, 1904. | Price, 3.00 |
| Vol. 2. | No. 1. | The Exploration of the Potter Creek Cave, by William J. Sinclair. Pages 27, Plates 14, April, 1904 | Price, .40 |
| | No. 2. | The Languages of the Coast of California South of San Francisco, by A. L. Kroeber. Pages 52, June, 1904. | Price, .60 |
| | No. 3. | Types of Indian Culture in California, by A. L. Kroeber. Pages 22, June, 1904. | Price, .25 |
| | No. 4. | Basket Designs of the Indians of Northwestern California, by A. L. Kroeber. Pages 60, Plates 7, January, 1905. | Price, .75 |
| | No. 5. | The Yokuts Language of South Central California, by A. L. Kroeber. Pages 213, January, 1907 | Price, 2.25 |
| Vol. 3. | | The Morphology of the Hupa Language, by Pliny Earle Goddard. Pages 344, June, 1905. | Price, 3.50 |
| Vol. 4. | No. 1. | The Earliest Historical Relations between Mexico and Japan, by Zelia Nuttall. Pages 47, April, 1906. | Price, .50 |
| | No. 2. | Contributions to the Physical Anthropology of California, by A. Hrdlicka. Pages 16, Tables 5, Plates 10, June, 1906. | Price, .75 |
| | No. 3. | Shoshonean Dialects of California, by A. L. Kroeber. Pages 100, February, 1907. | Price, 1.50 |
| | No. 4. | Indian Myths of South Central California, by A. L. Kroeber. Pages 84, May 1907. | Price, .75 |
| | No. 5. | The Washo Language of East Central California and Nevada, by A. L. Kroeber. Pages 67, September, 1907. | Price, .75 |
| | No. 6. | The Religion of the Indians of California, by A. L. Kroeber. Pages 38, September, 1907. | Price, .50 |
| Vol. 5. | No. 1. | The Phonology of the Hupa Language: Part I, The Individual Sounds, by Pliny Earle Goddard. Pages 20, Plates 8, March, 1907. | Price, .35 |
| | No. 2. | Navaho Myths, Prayers and Songs with Texts and Translations, by Washington Matthews, edited by Pliny Earle Goddard. Pages 43, September, 1907. | Price, .75 |
| | No. 3. | Kato Texts, by Pliny Earle Goddard (in press). | |
| Vol. 6. | No. 1. | The Ethno-Geography of the Pomo and Neighboring Indians, by S. A. Barrett. Pages 332, Maps 2, February, 1908. | Price, 3.25 |
| | No. 2. | The Geography and Dialects of the Miwok Indians, by S. A. Barrett. Pages 36, Map 1, February, 1908. | } In one cover. Price, .50 |
| | No. 3. | On the Evidences of the Occupation of Certain Regions by the Miwok Indians, by A. L. Kroeber. Pages 12, February, 1908. | |



GROUND-PAINTING AT BOYS' AND GIRLS' PUBERTY CEREMONIES.

1. Hunwut tukwut, bear panther.
2. Changichnish, raven.
3. Showut, black-rattlesnake.
4. Kuihengish, black spider.
5. Apmikat.
6. Pidpidiwut, breaker.
7. Kulawut, stick.

UNIVERSITY OF CALIFORNIA PUBLICATIONS

IN

AMERICAN ARCHAEOLOGY AND ETHNOLOGY

Vol. 8, No. 4, pp. 187-234, Pl. 20

August 7, 1908

THE CULTURE OF THE LUISEÑO INDIANS.

BY

PHILIP STEDMAN SPARKMAN.

CONTENTS.

	PAGE
Editor's Note	188
Introduction	188
Vegetable food	193
Flesh and hunting	197
Fishing	200
Clothing	200
Pottery	201
Articles made of plant fibers	202
Baskets and basket making	204
Bows and arrows	205
Stone implements	207
Feather objects	208
Fire making	209
Gums, dyes, and paints	209
Miscellaneous	210
Games	212
Houses	212
Marriage	213
Government	215
Shamanism	215
Changichnish the raven	218
Spirits and monsters	219
Boys' puberty ceremonies	221
Girls' puberty ceremonies	224
Mourning and mourning ceremonies	226
Appendix. Plants used by the Luiseños	228

EDITOR'S NOTE.

Philip Stedman Sparkman, the author of this paper, by birth an Englishman, was killed at his home at Rincon, near Valley Center, San Diego county, California, May 19, 1907. For years before his death he had spent much time in communication with the Luiseño Indians of Rincon and vicinity, and in the study of their language, of which he published a sketch in the *American Anthropologist* of 1905. He left a voluminous manuscript grammar and dictionary of the Luiseño language, which have been secured for permanent preservation by the University of California and are being prepared for publication. Among the papers obtained by the University is the following account of the culture of the Luiseños, which is presented without addition and with only such minor alterations as have been necessary to make it ready for the printer. A Luiseño tale recorded by Mr. Sparkman is published in the *Journal of American Folk-Lore* of 1908. Several papers issued in this series of University of California Publications, especially "The Religion of the Luiseño Indians of Southern California," "Shoshonean Dialects of California," "A Mission Record of California Indians," and "The Ethnography of the Cahuilla Indians," treat in part or wholly of the same Indians as the present account or of closely related tribes. It will be found that these papers and Mr. Sparkman's corroborate one another closely. Even the slight discrepancies, resting on information independently obtained and representing significant differences of point of view, may have value for future students.

INTRODUCTION.

The Luiseños belong to the large Shoshonean linguistic family, which includes the Bannocks of Idaho and Oregon, the Utes, Paiutes, Comanches, Mokis, and other tribes. Indians of Shoshonean family occupied the coast of California from the mouth of Agua Hedionda creek to about Point Duma. They also occupied the islands of San Nicolas, Santa Catalina, and perhaps San

Clemente also. The first European to visit their territory was Juan Rodriguez Cabrillo, a Portuguese in the Spanish service, who in 1542 saw Santa Catalina island and visited what is now known as San Pedro bay.

That branch of the family known as Luiseños occupied the coast from above San Juan Capistrano to the mouth of Agua Hedionda, and are thus the most southwesterly tribe of the Shoshonean linguistic family in the United States. We cannot pretend to give the exact boundary of their former habitat, but will do so as nearly as possible. Beginning at the mouth of Agua Hedionda, it ran so as to include what was afterwards the San Marcos rancho, also most of the Escondido rancho, one of their villages being situated in the ravine near the gold mine. From here the boundary ran so as to include the Mendenhall and Maxcy ranches, also most of Guejito; from here to the San José valley, part of which it included; from here to near Cahuilla valley; from here so as to include Saboba and Temescal; and from there to the sea near San Juan Capistrano. The language spoken at San Juan Capistrano, as well as that of Saboba, differs considerably from that of the remainder of the Luiseños, and by some the people of those places are not included among the Luiseños.

“Rio San Luis Rey de Francia,” River St. Louis King of France, was the name given by the Franciscan friars to what is now known as the San Luis Rey river. Four miles up the river from its mouth was established the mission of San Luis Rey de Francia in 1798. Twenty miles higher up the river the mission of Pala, an outpost of San Luis Rey de Francia, was established in 1816. The Indians who were gathered at these two missions were called “San Luiseños” by the Franciscans. “San Luiseños,” the equivalent of “St. Louisans” in English, has now been shortened generally to “Luiseños,” and adopted by the tribe as their designation, they, like many Indians, having no name for themselves, except one merely meaning “people.”

The neighbors of the Luiseños on the south are the Diegueños, who belong to the Yuman linguistic family. On the north and east are other Shoshoneans known as Cahuillas. This appellation they were given by the Mexicans; it is not, as has been supposed, their native name.

The Luiseños of whom we more particularly write are those living in the valley of the San Luis Rey between Pala and the San José valley. These formerly occupied not only the river valley but also Palomar mountain, and there is a tradition among them that they formerly went to the coast in winter. It must not be supposed that they wandered at will over this territory; on the contrary, each band had its allotted district, in which it alone had the right to gather food and hunt. Thus each band had its tract in the San Luis Rey valley, and another on Palomar, to which it moved during the acorn-gathering season. The land of each band seems to have been sometimes again subdivided among the different families of which the band was composed; at least that part of the land which was valuable for certain food products was thus subdivided.

Each band seems to have guarded its allotted territory with the greatest jealousy, and more quarrels are said to have arisen over trespassing than from all other causes combined. When questioned as to when or how the land was divided and subdivided, the Indians say they cannot tell, that their fathers told them that it always had been thus. Many of the older ones remember how they were cautioned when young never to trespass on the land of others in pursuit of game or food without permission. Yet occasionally a band would become dissatisfied with its habitat, and forcibly intrude itself into that of another. An instance of this took place so recently as still to be remembered and spoken of.

Luiseno geographical names are very numerous indeed, every small tract with any distinguishing feature being named. Sometimes there will be a name for a large tract of country, and then other names for small portions of such a tract. This is not, however, the rule. Usually each small tract has its name, without any general name for the larger area. But large tracts outside of Luiseno territory are known by a general name. Some geographical names are descriptive, but most of them are not. Many of the names given below are those of old village sites near modern localities and settlements, but now applied to these localities. Many names are derived from plants and animals which are or were abundant near the locality named after them.

Totakamilum	Coronado Islands ¹
Kimki harasa	San Clemente Island ²
Ponga'	Santa Catalina Island ²
Palimai	Slough at mouth of Agua Hedionda Creek
Exla tovtotva	Colorado desert
Paauw	Palomar mountain
Yamiwa	San Jacinto mountain
Wikyo	Highest peak of Palomar mountain
Takwish poshapila	Rocky peak east of Wikyo
Pewipwi	San Bernardino mountain
Kachikchi	Cuyamaca mountain
I'pax	Highest peak of Volcan mountain
Taakwi	Cahuilla mountain
Pashkwo	Monkey hill, San José valley
Katukto	Moro hill, near Fallbrook
Kolo	Mountain nearly opposite where Escondido ditch comes out of San Luis Rey river
Ponawuk	Hill near Pala flour mill
Ta'i	Peak of Palomar, near Bougher's
Kaxpa	Antonio Serrano's house on Pauma ranch
Akipa	The small flat on Pauma ranch
Hunalapa	Oak flat (Pauma ranch)
Tutukvimai	Rodeo (Pauma ranch)
Yami'	Site of Potrero ranch house
Tomka	Valley above same
Kuka	Old Potrero village
Tumau	Site of Pala flour mill
Malamai	Agua Tibia
Pa'i	Agua Tibia warm spring
Kupa	Agua Caliente
Temeko	Temecula
Pichaang	Pichanga
Keish	San Luis Rey
Alapi	San Pascual
Malakash	Santa Ysabel village

¹ Compare the names of places given in the present series of publications, IV, 142-150, 1907, and VIII, 108 *seq.*, 1908.

² The names and identifications of these islands were variously given by different informants of the author. *Cf. ibid.*, VIII, 108, note '80. A San Juan Capistrano Indian in 1907 said: "Santa Catalina es Kinke (qinqe). San Clemente no tiene nombre, esta pegado a Santa Catalina, es la misma cosa."

Saumai	Site of J. Q. Adams' store at Valley Center
Shakishmai	Site of house on Maxey ranch
Yangi'wana	Mesa Grande
Ushmai	Las Flores
Woshha	Rincon
Pala	Pala
Paisvi	Iron spring on Palomar
Wavam	Where the Pauma Indians had their encampment during the acorn-gathering season on Palomar
Shoau	Where the Pala Indians had their encampment during the acorn-gathering season on Palomar
Shautushma	Where the Yapicha Indians had their encampment during the acorn-gathering season on Palomar
Sulpa	Where J. Frey lives
Akwo	Spring where S. Gamez lives
Mutamai	Where Luis Majel lives
Yuimai	Where Juan Despierto lives
Ahuya	Old village site above Rincon on road to Potrero
Topamai	Old village site on Santa Margarita Ranch near ranch house
Malava	Old village site on Palomar
Wiya'	Old village site on Palomar
Chakuli	Old village site on Palomar
Ashachakwo	Old village site on Palomar
Pahamuk	Old village site on Palomar
Tokamai	Old village site on Palomar
Pavla	Where Indians of Kuka or Potrero encamped while gathering acorns on Palomar
Mokwonmai	Old village site on Palomar
Pakuka	Spring on east side of Palomar
Atupa	Spring on east side of Palomar
Awa'	Aguanga
Pawi	Warm spring in middle of village at Cahuilla valley
Chawimai	Los Durazos, Cahuilla valley

VEGETABLE FOOD.

The Luiseños had a great variety of food, though to a casual observer the district they inhabit appears to be, for the most part, of a semi-desert character, especially in the latter half of the year.

The winter and spring rains cause numerous annual plants to grow, and many of these are used as greens, being either boiled or eaten fresh with salt.

The seeds of many plants are also used, besides numerous fruits and berries. Seeds are always parched, this being effected by placing them in a broken piece of pottery, or a vessel made for that purpose, and toasting them over the fire, stirring them to prevent burning. Formerly they were often parched by being placed in a basket with live coals, and shaken until they were sufficiently cooked. After being parched, seeds are pounded into flour in a mortar. When required for use, this flour is mixed with water to form a mush, which is eaten cold.

The staple food of the Luiseños, as of so many California Indians, was acorns. At least six species of oaks are found in Luiseño territory. The acorn considered by far the most palatable is that of the black or Kellogg's oak, *Quercus Californica*. This begins to be found at an elevation of about three thousand feet, and is abundant on Palomar.

Next to the black oak the acorns of the common live oak, red oak, or field oak, *Quercus agrifolia*, are most esteemed. This tree is found from the coast to over three thousand feet above sea level. The acorns of this species contain more oil than those of the black oak, and the meal ground from them is of a yellow color.

Quercus chrysolepsis, usually called the maul or Valparaiso oak, grows on Palomar in the cañons at a somewhat lower elevation than the black oak. Its acorns, which are the largest and hardest of any of the oaks, are also considered to be palatable, though difficult to grind, and are gathered when those of the two species first mentioned fail.

The acorns of the white oak, *Quercus Engelmanni*, the live oak, *Quercus Wislizeni*, and the scrub oak, *Quercus dumosa*, are

not at all esteemed, and are only used when other acorns cannot be obtained.

Until quite recently large quantities of acorns were gathered and stored away in acorn granaries. When required they were taken from the granary, placed one by one on a stone, and struck with another stone with sufficient force to crack the hulls. They were then placed in the sun, which caused the hulls to break open, after which these were removed from the acorn with a bone tool, *maavish*.

Afterwards the acorns were pounded into flour in a mortar, a stone pestle being used for this purpose. The meal is leached with hot water to take out the bitterness. This is sometimes accomplished by placing it in a rush basket and pouring warm water over it; at other times by placing it in a hole made in sand, and then pouring warm water over it, the water soaking away through the sand. The leached meal is afterwards cooked in an earthen vessel.

The importance attached to acorns as food is shown by the fact that large pines were often cut down merely for the sake of the acorns stored in the bark by the woodpeckers.

The kernel of a wild fruit, a kind of plum or cherry, *Cerasus* or *Prunus ilicifolia*, was formerly used to some extent as food. The fruit was spread in the sun until thoroughly dried, when the shells were cracked and the kernels extracted. These were ground into flour which was leached and cooked in exactly the same manner as acorn meal. This flower is almost as white as that made from wheat. The pulp of the fruit is also eaten, but it is exceedingly thin, though not unpleasant to the taste. This fruit grows but sparingly in the San Luis Rey basin, but large quantities grow in the hills and cañons around Cahuilla valley, where it was formerly an important article of food.

Choke cherries are much liked, notwithstanding their puckery taste. They are considered to improve by being kept for a few days after being gathered.

The berries of the toyon or Christmas berry, *Heteromeles* or *Photinia arbutifolia*, are used as food, being parched and eaten without further preparation.

The berries of several species of gooseberries, currants, and

blackberries were eaten, but these grow but sparingly, and were not an important article of food.

Elderberries grow in great abundance in some parts of the San Luis Rey valley. They are much liked, and were formerly gathered in large quantities and dried, besides being cooked and eaten when fresh.

Wild grapes, which abound in the San Luis Rey valley, are cooked and eaten, but they were never dried and preserved like elderberries.

There are several species of prickly pear cactus, the fruit of some of which is much esteemed, while that of others is not. It is eaten fresh, and was formerly peeled, dried in the sun, and stored away for future use, being eaten without being cooked. The seeds were saved, parched, ground into meal, mixed with water in the usual manner, and used as food. The seeds of the cactus known as "cholla" were also used.

The berries of the aromatic sumac, *Rhus trilobata*, were ground into meal and used as food, as were manzanita berries. The pulp only of the latter, but the entire berry of the sumac, was used. Neither of these kinds of berries were parched before being ground, nor was the meal afterwards cooked, but simply mixed with water and eaten.

The bulbs of several plants of the lily family were used as food. They were mostly eaten fresh, but were sometimes cooked.

The edible ground-mushroom is little esteemed, but the tree mushrooms that grow on cottonwood and willow trees are still a favorite article of food. Care is taken to gather them when tender. They are prepared for food by boiling.

The scape or stalk of *Yucca Whipplei*, which grows quite abundantly in many localities on the hillsides, is roasted and eaten, as also was formerly the head of the plant, which was prepared for food by roasting in an earth oven.

By earth oven is meant a pit dug in the ground, in which stones are placed, and a fire built, which is kept up until the stones are well heated, when the article to be cooked is placed among them and covered over with earth.

The blossoms of both *Yucca Whipplei* and *Yucca Mohavensis* are eaten, being cooked in water.

The pods of *Yucca Mohavensis* are also eaten, being prepared by roasting in the coals.

The fresh tender shoots of the white sage are peeled and eaten raw. The fresh shoots of a large rush were also eaten raw formerly.

Mesquite trees are somewhat plentiful in parts of Luiseño territory, but not in the San Luis Rey valley, so the flour of mesquite beans is not an article of food here, though it is occasionally brought for sale from other localities.

Of the plants used as greens the most esteemed now-a-days is wild mustard, though this is probably an introduced plant, as it has no Luiseño name. It is the earliest food plant of the year.

Watercress and wild celery are both cooked, but not eaten fresh.

Several species of wild clover are eaten both fresh and cooked. Lamb's quarter, Indian lettuce, the leaves of the California poppy, peppergrass, and a great many other plants are boiled for greens.

Wild oats formerly were a favorite article of food. They were stripped with the hands from the stalk while standing, afterwards parched together with the husks, and pounded into meal in the usual manner. A favorite food is said to have been composed of oatmeal and dried elderberries, mixed with a little ground chia, the latter being probably used for seasoning.

The seeds of "chia," the Spanish name of *Salvia columbariae*, seem to be more esteemed than any other. Others much used are those of the white and black sages, the thistle sage, the soap-plant *Chenopodium Californicum*, peppergrass, and several Compositae. Some of the seeds used are so excessively small and difficult to collect that it seems probable they were more used by way of seasoning than for their actual food value.

An edible gum is obtained from the white oak, *Quercus Engelmanni*; this is the deposit of a scale-insect. After being gathered it is carefully washed to remove its bitter taste, and is then ready for chewing. It is used exactly as chewing gum.

Another gum is obtained from the milkweed, *Asclepias eriocarpa*. The sap of this plant, which runs out freely when the stems are cut, is collected and boiled in water until it coagulates.

It is then ready for use as chewing gum, and is much esteemed, but is not as lasting as that of the white oak.

FLESH AND HUNTING.

The largest game animal was the black-tail deer, formerly very abundant and still found. They were formerly hunted with bow and arrow, and were also, it is said, taken in snares.

Those who hunted with bow and arrow sometimes used a stuffed deer head with the antlers attached. This they fastened on their head, and on seeing a deer, would slowly approach it, lowering and raising, or bobbing the deer head from side to side. In this manner they often approached sufficiently near to the deer to kill it. The snare was made by placing a running noose in a deer trail, so that the animal would entangle its feet in it. The noose being fastened to a pole which was bent over and lightly fastened to the ground, the struggles of the deer would loosen it; it would then fly back and leave the animal suspended in the air.

There is a place where deer were once said to have been killed by being driven over a precipice, at the foot of which they would be found dead; but it is also said that after a time it was impossible to drive them over it, as they would double back in spite of every effort to prevent them.

Venison was cooked by broiling on hot coals, also in the earth oven, and sometimes, though less often, by boiling in water. When cooked in the earth oven it was sometimes pounded up finely in a mortar, and stored away for future use. The entrails and blood of deer were both used.

In some parts of the territory occupied by the Luiseños antelopes were formerly abundant, notably between Temecula and San Jacinto, but the last were killed about twenty years or more ago. It is said there never were any in the upper San Luis Rey valley.

It is doubtful if much large game was ever killed by the Luiseños with their crude weapons. The principal animal food probably always consisted of jackrabbits and rabbits, which are still the chief game animals. But an exception must be made of

the people who lived permanently on the coast, whose chief flesh diet was fish and mussels.

Now-a-days jackrabbits and rabbits are either killed with a shotgun or small caliber rifle, or hunted on horseback with sticks two and a half or three feet long.

Formerly these animals were hunted with bows and arrows, or trapped by draw nets and snares placed in their runs. They were also driven into a long net stretched across a suitable place, a number of Indians assembling for the purpose.

They were also killed with a flat, curved stick, wakut, which has erroneously been spoken of as a boomerang. Formerly when an Indian went to the field he carried one of these sticks in addition to his bow and arrows. If he saw a rabbit or other animal that he wished to kill standing, he shot at it with the bow; if it was running, he threw the stick at it.

There are two kinds of rabbits, the cottontail and a smaller, darker one weighing only a little more than a pound when full grown.

Rabbits and jackrabbits were usually cooked by broiling on hot coals. They were also sometimes cooked in the earth oven. Sometimes, after being cooked in the latter manner, their flesh, together with the bones, was pounded up in a mortar, and either eaten at once or stored away for future use.

A wood rat is much liked. This animal builds a nest of small sticks, sometimes quite large, in the brush or undergrowth, in the cactus, and occasionally in trees. In hunting it the nests are often set on fire to drive it out, one, or rarely two, being found in each nest. Usually the nest is overturned, and the rats killed with bows and arrows or sticks. Numbers are sometimes killed after a flood has driven them out of their nests in the undergrowth along the river. Several other kinds of rats were formerly used as food, as well as ground squirrels and different kinds of mice. These animals were often trapped. Two flat stones were taken. On the lower one an acorn was placed on end, the upper stone resting on it, so that when the acorn was gnawed through by an animal the stone would fall and kill it. Since only small animals could get between the stones when baited in the above manner, for larger ones, as wood rats and ground

squirrels, a short stick was placed on top of the acorns. This made room for them to crawl between the stones and reach the bait.

Tree squirrels were not eaten. Neither were wild pigeons nor doves until quite recently, the latter from superstitious motives. The valley quail, found in great numbers in the San Luis Rey valley and adjacent country, even to the summit of Palomar, have always been eaten. They were formerly killed with the bow, and were also hunted at night with fire, dry stems of the cholla cactus being set on fire and used to attract them; when they flew towards the light they were knocked down with sticks. During a prolonged period of cold rainy weather they become chilled so that they cannot fly far; when in that condition they were formerly sometimes run down by boys. Mountain quail were also eaten. Rats, mice, quails, and squirrels were cooked by broiling on coals.

Ducks, formerly plentiful, were killed with the bow or with the throwing stick. Mudhens were not eaten. Larks and robins and the eggs of ducks and quails were eaten.

Bears were formerly quite common on Palomar, and also in Bear valley. They were occasionally killed, but their flesh was never eaten. Their skins and claws were saved, the latter being used to make necklaces. A stone was erected wherever a bear or mountain lion was killed.

Before a hunt a fire was sometimes built of white sage and *Artemisia Californica*. The hunters stood around this and in the smoke, the belief being that this absolved them from any breach of social observances they might have committed, which would otherwise bring them ill luck.

Grasshoppers have always been abundant in the San José valley, this being one of the localities in which they hatch. They were formerly eaten by the Indians who lived there, and sometimes by others. The manner of taking them was by digging a pit, which was surrounded at a distance by Indians with boughs, who drove them from all sides into the pit. This was of course before they had reached the flying stage of their existence. A fire was built upon them and they were killed and roasted at the same time. They are said to have been eaten without any further

preparation.

A large green grub was eaten. It was boiled in water and eaten with salt.

FISHING.

Mountain trout are found in a few localities in the upper San Luis Rey river, also in some of the mountain streams which empty into it. The only other fish is a very small one. The trout were taken when the water was low by macerating a plant and throwing it in the pools, when they became stupefied and rose to the surface, where they were taken by hand, or scooped out with a rush basket. The small fish were taken with a dip net.

While fish formed an unimportant article of food for those who lived inland, it was the chief dependence of those who lived on the coast. They used a canoe or raft of rushes, with which they went out some distance from the shore to fish with a dip net. Seine nets were also used. Some wooden canoes were also made from the trunks of trees. It is stated that voyages were formerly made with these as far as San Clemente island. The coast people also fished with hook and line. The line was made from the fiber of *Yucca Mohavensis* and the hook from an abalone shell, the part near the center being used, where the grain is more twisted, and so more suitable for the purpose. Fish hooks were also made of bone. The coast people also consumed large quantities of shell fish of several species. Some say that they used a harpoon for spearing fish, the bone point being loosely inserted in a socket at the end of a pole, to which it was attached by a line, so that on striking a fish the point was pulled from the socket, but was still attached to the pole by the line. Others say that no harpoon was ever used by them. This may be true, but it is certain that the Diegueños used one, and it seems improbable that the Luiseños would not have employed it.

CLOTHING.

The chief article of clothing was a cape-like garment of fur covering the upper part of the body and reaching almost to the knees, but this was probably only worn in the coldest weather. During most of the year the men are said to have worn no clothing at all. The capes were sometimes made of rabbit skins, cut

into strips and woven with a woof of twine. Others were made of deer-skins, and some of sea-otter skins. These latter were the most highly prized, but were not common, except perhaps on the coast.

Another article of dress was an apron, pishkwut, generally of net-work, made from the twine obtained from dogbane, *Apocynum cannabinum*, or the milkweed, *Asclepias eriocarpa*. Another apron, shehevish, was made of the inner bark of willow or cottonwood. This was worn behind, while the apron of network was worn in front. Both these aprons were worn exclusively by women, who never went entirely unclothed.

A basket hat of coiled ware was worn by women, especially when they had a burden to carry, when it was used to protect the forehead, the cord of the carrying net resting on it. Men might also use this basket hat when they had a burden to carry. Another covering for the head was woven from rushes; this was used in the same manner as the coiled basket hat.

POTTERY.

Some doubt has been expressed as to whether the Indians of Southern California understood the art of making pottery before the arrival of the friars. It does not seem that there is any doubt that at least some of them did. Costanso's report of the expedition of 1769 speaks, though somewhat vaguely, of the Indians of San Diego as using pottery. The Luiseños themselves say positively that they were pottery makers.

Several different kinds of earthen vessels are made, the commonest form being one used now for keeping water cool, and formerly also used for storing seeds. This is called narungrush. A form of vessel with an extra wide mouth, wiwlis, is used for cooking food, another with a small mouth, nadungdamal, for carrying water. As water is carried on the back or shoulder, it would spill out of a large-mouthed vessel, while the mouth of a small one is easily stopped up with a bunch of grass or rushes. One type of vessel, papakamal, was made with two small mouths. This form was of small size, and was used to carry a small amount of water for drinking when people were out gathering food. It

was carried by a string passed through the two small mouths, the Luiseños never making handles for their pottery or baskets. A bowl-shaped vessel was used for serving food. A shallow dish, *tevatvamal*, in shape between a plate and a saucer, was also used for serving food.

The only tools used in pottery making are a flat piece of wood and a smooth pebble of suitable size. Pottery is baked by merely digging a pit and filling it with dry cow-dung, among which the vessels are placed. The dry bark of trees was formerly used, wood not making a sufficiently hot fire. The clay used is thoroughly kneaded and tempered, and strips or coils of it are gradually added to the edge of the growing vessel. We have never seen any painted pottery made by the Luiseños, but the *Cahuillas* who live on the Colorado desert sometimes ornamented theirs.

A pipe, *hukapish*, was sometimes made of clay. It was short and tubular, tapering rather abruptly toward the small mouth-end.

ARTICLES MADE OF PLANT FIBERS.

The best fiber is made from dogbane or Indian hemp, *Apocynum cannabinum*, a perennial plant with annual stems. The inner bark furnishes the fiber. Sometimes the outer covering is scraped off and the inner bark then removed from the stalk; or the bark is pulled off entire, and soaked in boiling water, after which the outer covering easily separates from the fiber. In either case the fiber is rolled into a ball, and made into twine by rolling it between the palm of the hand and the bare thigh.

A milkweed, *Asclepias eriocarpa*, furnishes a light-colored fiber, but it is not so durable as that obtained from dogbane. The fiber is separated from the pulp by soaking the stems in boiling water; or, late in the season, when the pulp has decayed, it may be separated by merely basting the stems. It is then made into a ball, which is afterwards made into twine in the same manner as dogbane fiber.

The common nettle, *Urtica holosericea*, also furnishes a fiber, but it is little esteemed.

The twine made from the plants mentioned is usually two-ply,

but three-ply and four-ply twine is also made.^{2a} Bowstrings are made from such twine, generally of dogbane.

A large-meshed net for carrying bulky or heavy articles, ikut, is also made from twine. This carrying-net has a cord attached that passes across the forehead, which bears part of the weight of the contents. A net-work sack for carrying acorns, kawish, was formerly made, the mesh being sufficiently small to prevent the acorns from falling through. The mouth of this sack might be tied and the sack itself placed in the large-meshed carrying net, or it could be used alone, as it had a cord attached to it in the same manner as the carrying net. One we have seen would probably hold about a bushel. Other net-work sacks with a still finer mesh are said to have been made at one time. In these small seeds were carried.

A long net, yulapish, for use at rabbit drives, was occasionally made. These were considered very valuable, much time being consumed in their manufacture. A draw-net for catching rabbits and jackrabbits was also made. This was placed in their runs, or stretched between bushes where they would be likely to pass. An endeavor was then made to drive them towards the nets. A small fine-meshed dip-net was made for catching a very small fish found in streams. A large dip-net was made for sea fishing.

The front apron worn by women was also formerly made from this cordage, sometimes of net-work and sometimes of loose strings suspended to a cord tied around the waist.

Slings, pivanlish, were also made from twine, and it was used for many other purposes. The fiber of *Yucca Mohavensis*, so much used by the Cahuillas, is seldom employed by the Luiseños, though a fish line was formerly made from it. The leaves are soaked in water until the pulpy part decays, when they are basted to separate the fiber.

From the fibers covering the bulb of the soap-root, *Chlorogalum pomeridianum*, a small brush, alukut, is made. This is used, in pounding acorns, to sweep up the scattered meal, and to brush it from the mortar.

^{2a} The twine made by the California Indians was almost invariably two-ply. Perhaps the Luiseño three-ply and four-ply string is due to European influence.

BASKETS AND BASKET-MAKING.

Basket making is an art in which the Luiseños are quite adept. Their usual basketry is a coiled ware, the foundation of the coil being composed of a long grass, *Epicampes rigens Californica*. The splints with which the coil is wrapped are usually from the aromatic sumac, *Rhus trilobata*, but when it is wished to give a brown color the lower part of a rush is used.

Several different forms of these coiled baskets are made, each having a different name, and being used for a different purpose. One conical shaped basket did duty as a hat, *chilkwut*, and was also used as a drinking vessel, also at times to eat out of. A large basket, *peyevla*, was used for storage purposes, various kinds of food being kept in it. A nearly flat basket, *tukmal*, was used for winnowing and cleaning seeds, and for other purposes. To winnow, the article was placed in the basket, lifted in the air, and allowed to fall slowly so that the wind would carry away the rubbish. The most common basket, *pa'kwut*, is basin-shaped. This form varies in size. Fourteen inches in diameter and four deep would be a medium size. Another kind, called *peyevmal*, usually has the sides bulging slightly, with the mouth drawn in; these are the smallest of all.

Baskets are always patterned with black, and sometimes also with brown, on the light ground of the sumac, and rarely a basket is made entirely black or brown. No model is ever used, except possibly of late years occasionally; and no two baskets are ever exactly alike. Basket-making is a very slow and tedious process, there being from ten to eighteen wraps of the coil to an inch in an ordinary basket, and in rare cases even more. Quite a small basket, if well made, will require ten thousand stitches or wraps of the coil. Sometimes a pattern is made to represent a bird, animal, or leaf, but most of them represent the momentary fancy of the maker. Much has been written to prove that Indian basket patterns have some hidden symbolic or religious significance, but in the case of the Luiseños they have none whatever. On this point we speak positively.

Besides the coiled baskets, woven or twined ones are made from a rush, *Juncus Mertensianus*. These are of open-work, and

are quite roughly made. One kind is used as a sifter, another to leach acorn-meal in, others of different sizes are used for every-day purposes, such as gathering acorns and cactus. It is known that some of the Indians of Southern California made baskets of rushes, coated with asphaltum to render them waterproof, but the Luiseños say that they never made this class of baskets.

BOWS AND ARROWS.

Bows are usually about five feet long, somewhat thicker in the middle, and gradually tapering towards the ends, the intent being to give more spring to the bow and carry the arrow with greater force. They are commonly made of willow, also of elder and ash, which are considered superior to willow. Excellent wood for making bows is said to be furnished by a species of mountain ash, and still better by a shrub that grows in a few places on Palomar mountain.

The arrow generally used has a mainshaft of cane, *Elymus condensatus*, and a foreshaft of a greasewood, *Adenostoma fasciculatum*, which is generally hardened in the fire. The mainshaft will perhaps average about two feet three inches in length, and the foreshaft about nine inches. The latter is inserted in the hollow end of the cane used for the mainshaft, glued in place with pitch or asphaltum, and bound firmly with sinew.

Three trimmed feathers are attached to the shaft by wrapping with sinew, a little asphaltum being used to keep the sinew threads from slipping out of place. The feathers are not tied straight on the shaft, but twisted slightly to one side, the object being to give a rotary motion to the arrow, and so, it is thought, hold it straighter to its course, on the same principle as the spiral grooving of a rifle barrel. The feathers used are mostly from different species of hawks.

Some arrows were formerly tipped with stone points, teket, the base of the point being inserted in a notch in the end of the foreshaft, to which it was securely tied with sinew, gum or asphaltum being also used to assist in keeping it in place. The gum most esteemed for this purpose was that obtained from the greasewood, *Adenostoma fasciculatum*, the same shrub from which the foreshafts are made.

Small arrows are also made from the stems of two tall weeds, *Artemisia heterophylla* and *Heterotheca grandifolia*. These arrows have a foreshaft, and are feathered like those of cane.

All the above arrows are straightened by means of a grooved stone, yaulash. This is heated in the fire, and the arrow passed back and forth along the groove until it is thoroughly heated, when it is straightened and allowed to cool, after which it will retain its shape.

Arrows are also made from the arrow-weed, *Pluchea borealis*.³

The stone points or arrowheads always have a concave base. Farther north tanged arrowheads were sometimes used, but the Luiseños did not employ them.

Arrowpoints are chipped or flaked into shape with a tool, pilaxpish, made from a piece of deer antler. Some arrowpoints are quite large, the two ends of the concave base projecting considerably on either side of the foreshaft, while others are very small indeed.

An ordinary Luiseño bow will carry an arrow about one hundred yards, but is not effective for more than half that distance. When not in use it is always unstrung to keep the string from weakening. Bowstrings are oftenest made of the fiber of dogbane, *Apocynum cannabinum*, but are also made from that of milkweed or the stinging nettle. Most of the strings are two-ply, but some are three-ply and four-ply. They are also made of sinew thread, and then are always three-ply.^{3a}

The quiver is made of the skin of a fox, wildcat, or other animal, and is slung over the shoulder by a cord attached to it. A small quantity of long tree-moss may be placed in the bottom to keep the arrowpoints from being damaged.

In using the bow, arrows of arrow-weed are grasped between the thumb and forefinger, but other kinds are held loosely between the fingers, usually between the first and second; this leaves all the four fingers free to draw the bowstring.

³ This sentence was left uncompleted by the author. Perhaps he intended to add that this type of arrow lacked foreshaft and stone point.

^{3a} Two Cahuilla bows in the Museum of the Department of Anthropology show three-ply sinew string. The sinew strings on two of three Mohave bows are also three-ply.

STONE IMPLEMENTS.

Many stone implements have been found in the habitat of the Luiseños whose use they have lost all knowledge of, if indeed they were not left behind by some other tribe who formerly occupied the territory.

The ordinary pestle is merely a conveniently shaped stone, and the ordinary mortar a hole in a large flat granite rock near the dwelling. But many mortars are made of roundish boulders, mostly granite, though some are of tufa rock from a locality near the coast. So there are two kinds of mortars, the permanent ones of the large rocks, and others made from loose boulders, which, being portable, may be used where there are no large rocks near, or when, on account of bad weather, it is necessary to do the grinding under shelter.

In beginning to make a new mortar, *arusut*, the hole was not hollowed out at once to the required depth. A slight cavity was chipped in the rock, and a basin-shaped basket placed over it and glued in place with asphaltum or pitch, the sides of the basket keeping the acorns or other seeds from flying out when struck with the pestle. But with constant use the slight cavity made in the rock becomes deeper and deeper until the basket is no longer necessary, when it is removed. Many discarded mortars are found that have been worn clear through by continual pounding. Often on a large flat rock a number of mortar holes will be found, some of them of the usual depth, others only an inch or two deep, evidently just begun, while others may be a foot or more in depth, which having by continued use become too deep, have been abandoned and the new holes commenced.

One kind of mortar, *tamyush*, was used exclusively by the medicine men for pounding up the roots of jimson weed, *Datura meteloides*, for use at the boys' puberty ceremony. Some of these are quite symmetrical, being polished with considerable care, and some have even an attempt at ornamentation in the shape of grooves cut on the outside. The pestle of these mortars is also neatly shaped and polished. Another and very small mortar, *tamya-mal*, is said to have been used for mixing paint. This is also polished, and is almost exactly round.

It is a question whether the metates or grinding stones, ngohilish, now in use were employed prior to the arrival of the Mexicans. Some of the Luiseños think they were, while others say they were not, that their ancestors used only mortars. The rub-stone of the metate is called ngohilish po-ma, metate its-hand.

Flat perforated stones have been found. It is thought these were formerly used for cooking, the hole enabling them to be easily handled, when hot, by a stick thrust through them. They were probably also used for heating water.

A large stone tool has been found which may perhaps be called a stone adze. It weighs nearly eleven pounds, and was evidently intended to be used by being grasped with both hands.

Small sharp-edged flakes of a hard black stone were used as knives. Larger stones with a cutting edge were probably used for skinning or fleshing hides, but some are heavier than would be required for these purposes.

FEATHER OBJECTS.

The most valuable article made from feathers is a sort of apron or waist dress, pa'lut. This extends about half way around the body, the upper portion being net-work. To the lower part of the network the feathers are attached by cutting part of the twine of the network, and tucking it into the hollow of the quill. The wing or tail feathers of only three birds can be used to make this skirt, namely, the golden eagle, the bald or white-headed eagle, and the California vulture or condor. It is worn at the morahash dance.

Another feather object, a long and flat band, is made of a double row of feathers strung on two strings, the quills, which are turned inwards, being perforated, and the strings passed through the perforations. This object is worn slung over one shoulder, so as to hang diagonally across the chest.

A bunch of feathers tied on the end of a stick, cheyat, is fastened on the head and worn at certain dances. The feathers of owls, hawks, and crows are used.

Feathers fastened to a cord so as to form a head-band are worn at several dances and ceremonies.

FIRE MAKING.

The wood most used for fire making is that of *Baccharis Douglasii*. A flat stick of this, as dry as possible, is obtained and a shallow hole made in it, from which a small notch is cut to the edge of the stick. The drill, a short piece of wood with the lower end trimmed to fit the hole, is then placed in it and twirled rapidly between the palms with a downward pressure. This causes a fine dust to be ground from the stick. This dust runs out to one side through the notch, and if conditions are favorable, after a time ignites, no tinder being used. But if the wood is not thoroughly dry, or if the air is moist, it is exceedingly difficult to kindle a fire by this method.

GUMS, DYES, AND PAINT.

The most useful pitch is the asphaltum found where it has been thrown up on the coast by the waves, also in some localities inland. This is used for various purposes, such as mending broken pottery, gluing foreshafts of arrows to the mainshaft, and so on. A gum is obtained from a shrub growing in great abundance in certain parts. This is caused by a scale insect. It was formerly used to glue arrowheads to the foreshaft. The gum of pines was also used.

To obtain the black color seen in baskets the splints of sumac are boiled in water in which oxide of iron from water impregnated with iron, and some of the black dirt or muck from marshy places, have been placed. A yellow dye is obtained from the roots of *Psoralea macrostachya*, a tall leguminous plant growing along streams, by boiling them in water with the substance to be dyed. The juice of blackberries is sometimes used to stain articles of Luiseño manufacture. This is of course not permanent.

An excellent red paint was made. Many rock paintings made with it are still to be seen, although it has not been used for many years. Three different ingredients were used in its manufacture, one being the oxide of iron already spoken of as being used to make a black dye. Another was turpentine obtained from pine

trees, and the third the ground kernels of the seeds of chilicothe, *Echinocystis macrocarpa*. These were probably valued for the oil they contain. We cannot learn that any animal fats were used in this red paint. This is the paint with which paintings were made on rocks during the period of restriction of the girls' puberty ceremony.

MISCELLANEOUS ARTS.

The root of *Chenopodium Californicum* was grated and used as soap, also the bulb of soap-root, *Chlorogalum pomeridianum*. The fruit of the wild gourd, *Cucurbita foetidissima*, is broken open when ripe, and the inside rubbed on articles to be cleaned.

A white clay is used to wash the head with; it is thought to be beneficial for dandruff.

The pilaxpish or deer-antler tool for flaking stone arrow-heads has been mentioned.

A chisel was also made from deer antler. The base of the antler formed the butt of the chisel, which a stone hammer was used to drive. An antler as straight as possible was selected.

Tobacco pipes, hukapish, were usually made of clay, and had no stem, a person, it is said, lying down to smoke. One kind of pipe had a stem, but this seems to have been used only at religious festivals.

A rattle, paayat, is made of one or more land-turtle shells, with choke-cherry stones or certain seeds inside.

A rattle was also made of a number of deer hoofs tied on the end of loose strings. This was formerly used by hunters at a ceremony performed by them before going to hunt deer, with the idea of insuring their success.

Necklaces of deer hoofs, also of bear claws, were sometimes worn at certain dances.

A mat of reeds or rushes was made by perforating and passing twine through them. One was three feet by two feet nine inches, and had four rows of twine. In this mat were rolled up the articles used at religious ceremonies by the chief of festivals, not only his own, but also of the other members of his clan.

Until quite recently a large receptacle was made for the

storage of acorns. Where boulders of sufficient size were near the dwelling, the receptacles were placed on top. Otherwise they were put on platforms of poles. They were made in a very rough manner of coils of willow, *Adenostoma fasciculatum*, or other plants. These receptacles have generally been called acorn granaries. The mouth is covered with a flat stone. They are said to have held eight to twelve bushels.

A bullroarer, momlaxpish, consists of a flat stick with a double string passed through a hole at one end. When the string is twisted tightly and the stick swung around the head it makes a loud humming noise, and is used to call the people together at feasts.

Several ornamented sticks were used at religious ceremonies. One of these, paviut, had a pointed crystal inserted in one end, and sometimes bits of shell glued to the sides with pitch a little below the crystal.

There seems to have been no musical instrument except a rude flute, widolish. This was made from a piece of elder wood with the pith removed. Specimens seen were about twenty inches long, and had four holes.

A popgun of elder wood was made as a plaything for boys.

A syringe was made of the bladder of a deer and a piece of cane, the bladder being inflated and then pressed with the hands to eject the contents.

Several herbs are used to make tea, which is used partly as medicine, and also as a beverage by people who are not ill. The tea is made by steeping the plants in boiling water. The plants are sometimes used fresh, but are oftener dried. The bird-claw fern, *Pellaea ornithopus*, is one of the plants used for this purpose. Another is *Micromeria Douglasii*, a creeping aromatic plant of the mint family growing in the shade of trees. Another plant of the mint family, *Monardella lanceolata*, is also used.

A tea was made from several different plants that were bitter and acted as emetics when the throat was tickled with a feather. Emetics were formerly much used.

The Luiseños made no intoxicating drink of any kind whatever, the stupefying jimson-weed, *Datura meteloides*, being used for religious purposes, not inebriation.

GAMES.

The chief gambling game of the Luiseños, tepanish, Spanish pion, is played with four small pieces of bone and four of wood dyed black. Fifteen sticks of wood about a foot long and of the thickness of a lead pencil are used as counters. Each pair of the pieces of bone and wood is tied to the ends of a doubled string about a foot long. These pieces of wood and bone represent whites and blacks. There are four players on each side. The four who play on one side each take a white and a black piece and sling them to their wrists by the strings, concealing their movements under a blanket or other covering. One of the opposing players then guesses in which hand the white pieces are held. Should he guess all four correctly, his opponents do not take any of the counters; should he guess three correctly, they take one; should he guess two correctly, they take two; should he only guess one correctly, they take three; while should he miss all four, they take four counters. The players whose white pieces are not guessed continue to hide them, their side receiving one counter for each mistaken guess, until the last piece on the first side is correctly guessed. The four players of the opposite side then take the sticks and bones, and one of their opponents guesses in which hand the white pieces are. This is kept up until one side has all the fifteen counters, thus winning the game.

A ring-and-pin game, chehut, is played with a string of the large acorn-cups of the Valparaiso oak. These are hollowed out and strung on a string which is tied to the larger end of a pointed stick. As many as possible of the string of cups are caught on the pointed end of the stick.

HOUSES.

The primitive house was of a conical form. A circular pit was dug in the earth, perhaps two feet deep. Some crotched poles were then set in the ground with the tops placed together, no king-pole being used. Other smaller poles were then leaned against these and the whole covered with brush so as to shed the rain. An opening was left at one side as an entrance. There

was also an opening left at the top for the smoke to escape. When the weather was fine, cooking was performed out of doors; at other times a fire was built in the center of the house. During cool nights a fire was also built in the center, and around this the inmates slept, with their feet towards it. A house built partly underground in this manner requires but little fire to warm it. Sometimes the entrance was through a covered way extending some distance, through which one crawled on hands and knees to enter. In the mountains the poles of the house were covered with cedar bark instead of brush, and on the coast large rushes or sedges were used to cover the pole framework. Often the house was built without any pit, especially if it was only intended for temporary or casual use.

Costanso, in his report of the expedition of 1769, speaks of the Indians of San Diego as living in "shelters of boughs and huts of a pyramidal shape covered with earth," and of those of the Santa Barbara channel as having houses "of a spherical form in the fashion of a half orange, covered with rushes, with the hearth in the middle, and in the top of the house a vent or chimney to give exit for the smoke." As the former of these people lived south and the latter north of the Luiseño and other Shoshonean tribes, much the same style of dwelling seems to have prevailed all along the coast slope of Southern California.

MARRIAGE.

Until recently a girl could not be taken for wife without the consent of her parents or guardian. The suitor had to make a bargain with them, and pay a price agreed upon, which seems to have been proportioned to some extent to his wealth, as a well-to-do man would be expected to give more than a poor one. Still marriage was not entirely a mercenary affair, as a man who was idle or worthless, or a poor hunter, had, it is said, much difficulty to obtain a wife, while one who was industrious, or a skillful hunter, could easily do so. This shows that the parents or guardians of a girl took an interest in her future welfare, and it seems probable that her own inclination was consulted to some extent.

All accounts agree, however, that after her parents or guardians had once disposed of her they had no more control over her.

Should she become a widow, or separate from her husband, she was free to marry whom she liked.

It is said that polygamy was not common, though some men would have two wives, and occasionally more. The most usual form was for a man to marry several sisters one after the other. It is said to have been permissible for a free woman, such as a widow, to herself propose to a man that he take her as a wife, even though he was already married, and it was thought unchivalrous for him to refuse to do so. If a man had two or more wives it was customary for him to give one of them to a brother who might have lost his only wife. Until quite recently it was thought to be in a measure obligatory for an unmarried woman to marry the husband of her deceased sister. For her to decline to do so was thought to show disrespect to the deceased sister.

Some say that another method of marriage was for a man and several of his friends to carry off by force the woman he wished to marry, even from the house of her parents.

Marriages with even distant relations were looked upon with extreme disfavor.

When a child is adopted by an Indian family it is looked upon as one of their own children, and its marriage with one of its foster relations is regarded as incestuous.

One remarkable belief was that when a woman had a child, certain acts on the part of its father would affect its health in the same manner as if they were performed by the mother herself. So for some time after the birth of a child its father was supposed to be as careful of himself as its mother. He was forbidden to smoke, as that would choke the infant. He was also careful not to take cold, as that would affect the infant's health. Neither, if it was winter, was it allowable for him to drink cold water. It was in fact thought improper for him to eat or drink anything that is usually prohibited to a woman with a newly born child. When an infant died within a few days of its birth, its mother often attributed its death to the violation by its father of some of the prescribed rules, and quarrels often arose between a husband and wife on this account.

It was customary for a woman for a certain time after bearing a child to keep herself with a fire in a close house.

GOVERNMENT.

There was no government worthy the name among the Luiseños, in which respect they seem not to have differed from most Indians of California.

Each clan⁴ appears to have inhabited a separate village, and to have been a law unto itself.

One sometimes hears of the power exercised by chiefs in other parts of America, but the Luiseños seem to have been more democratic. There appear to be no legends of powerful chiefs.

The religious chief of each clan seems to have possessed the most power, all matters pertaining to religion being under his control. This office was hereditary, though in some cases it might pass out of the direct line of descent, as when the heir was incapable of performing the duties. Women in some cases held the office.

The office of chief of the rabbit hunt was hereditary.

Presumably the medicine man possessed a certain amount of governmental power.

It is certain that the Indians fought at times, and it would seem that on such occasions they must of necessity have had a leader.

SHAMANISM.

As may be supposed, witchcraft is still much believed in, though not nearly so much as formerly. A person whose children are dying, even of such a disease as consumption, will imagine that some evilly disposed wizard is bewitching them. He will perhaps go to some wizard and ask him who is killing his children. The wizard will inform him that a certain person is doing so; and after this, nothing will make the man believe otherwise.

To bewitch a person it is considered necessary to get something belonging to his body, as a little of his hair, the parings

⁴ The term clan here and in the following pages appears to be the equivalent of the word band in the introduction. No mention is made by the author or by any other of clan-totemism. It would seem that the Luiseño clan or band was similar to the semi-totemic clans of the Mohave but without the totemism; or to the village of the greater part of California, with perhaps greater emphasis on real or imagined kinship and descent.

of his nails, some of his blood, or a handkerchief that he has blown his nose in. For this reason it was formerly customary when one had his hair cut to carefully sweep up every particle, carry it away, and bury it, for fear that some enemy might possess himself of it to bewitch him. Some follow this custom still.

One method employed by the wizards is said to be to make small images of the people they wish to kill, and to perform their incantations over them. It is said that such images have sometimes been found, either accidentally, or in the house of a wizard after his death. Should the finder burn them, the death of the wizard or witch is said to follow invariably.

The wizards, shamans, or medicine-men, by whichever name they may be called, are nearly all doctors. An Indian has but little faith in medicine, but much more in the supernatural powers of the medicine-men. It is a fact that the latter use remedies made from plants to some extent, but they rely mostly on shamanistic practices. One of their methods of treatment is to suck the part of the body affected, and pretend to draw out something. Sometimes it will be a greenish or blackish fluid, or perhaps a reddish liquid that they declare to be blood; at other times beetles, lizards, or stones. A Cahuilla doctor is said to have sucked a rattlesnake about a foot long out of a woman's chest. They also doctor by rubbing or blowing on the part of the body which is paining the patient. Sometimes the rubbing is performed with a stone of peculiar shape or color. They also use a bunch of feathers to shake over the patient, also sometimes a stick with a number of rattlesnake rattles tied on one end. Some of them must either be sleight-of-hand performers, or else possess the power to hypnotize. We have heard one who did not believe in their supernatural powers say that "they make you think you see things you don't see." We have often wondered if they believe in their own arts, and have come to the conclusion that they do to a certain extent, though they must know that their pretended sucking of substances from the bodies of their patients is fraudulent.

A substance is compounded by medicine-men which is supposed to cause persons of the opposite sex to become enamored

of its possessor. It is much used by both men and women who wish to get married, also by those whose husbands or wives have either left them or no longer feel affection for them. The mere possession of it is thought to be sufficient, but if it is wished to captivate a person a little of it may be rubbed on the hands, and an endeavor made to shake hands with him or her. It is also sometimes rubbed on the face. When it fails to accomplish the desired purpose, appeals are often made to the medicine-man to send a "stronger medicine." Many are willing to testify to the efficacy of this substance, but this is easily accounted for by the fact that their faith in it is so great that its possession gives them more courage than they had before. This may cause them to be successful, and they not unnaturally attribute it to the "medicine."

A family who had a relative die came to the conclusion that he had been bewitched by a certain person, a member of the family who was a medicine-man having declared that he had found out who killed their relative. So they talked over the matter of revenging themselves by in turn bewitching and killing their relative's slayer. Now this man was at Los Angeles, over a hundred miles away, and they were at first nonplussed how to get hold of something of his body to work on. After a while one of them remembered that he had been bled some time before, and that the blood had been caught in a broken piece of earthenware, which was afterwards thrown away in the bushes. So a search was made for it, it was found, and the old medicine-man of the family took it and worked with it for several days, holding it up and talking to it, and going through other performances with it. When he had completed his incantation, he and the rest of the family took the piece of earthenware to a graveyard one night and buried it.

Some time afterwards the man they wished to kill was taken ill in Los Angeles, and was brought home from there in a paralytic condition, "all twisted up." Soon after he died. Of course the medicine-man who had performed the incantation over the broken piece of pottery, claimed, and without doubt firmly believed, that he had brought about this person's illness and death.

Some medicine-men claim to have the power to make rain,

and go through performances with that end in view. Should it rain within several days, they claim that it is due to their efforts. Should it fail to do so, they seldom lack an excuse; perhaps it is because the people have no faith in them or ridicule them. But a commoner excuse is that some other rainmaker or medicine-man is envious of them, and, when they try to bring rain, works against them, and prevents them from doing so.

Especially do they claim this if a contrary east wind should rise when the clouds are coming up and it looks promising for rain. That is surely the work of some evilly disposed medicine-man who is jealous of them, and made the east wind rise to drive away the rain which was about to fall through their efforts.

CHANGICHNISH, THE RAVEN.

The raven was a bird much feared by the Luiseños. When one of these birds was heard croaking, or seen hovering about a village, or some of the old people dreamed of it, steps were immediately taken to propitiate it. This was done by dancing three nights in succession, and by certain offerings. Each family brought food, such as chia and other delicacies, in a flat or winnowing basket, and placed it on the ground. Around these baskets of food the dance was held. The food was afterwards given to the old people.

The ceremonies held with the object of propitiating the raven have given rise to the belief that Changichnish is a deity, whereas it is really the raven, and instead of being worshiped, the ceremonies are performed with the object of propitiating it.⁵ Father Geronimo Boscana, of the mission of San Juan Capistrano, appears to be responsible for this error, as he wrote an account of these ceremonies which was afterwards published by Alfred Robinson in 1846, in a book entitled *Life in California*. Father

⁵ Mr. Sparkman's statement on this point conflicts not only with those of Boscana but of Miss DuBois and other independent investigators. It would seem that his expression is stronger than he would have allowed it to remain had he lived to revise the present paper. In his Luiseño dictionary he defines Changichnish as "the generic name of several things held in superstitious fear or reverence, among them kawialwut, the raven, kuihengish, a large black spider, wiyala, rock crystals, also called Changichnish pouhu, and the different species of rattlesnakes." These are all mentioned by Miss DuBois as associated with Chungichnish in native belief.

Boscana spelled the word Chin-ig-chin-ich. His error as to the meaning of the ceremonies is a perfectly natural one, as it is by no means easy to get to the root of Indian beliefs and ceremonies.

Changichnish po-hulit, raven his arrow, is the name given to rock-crystals. These were believed to have been shot by ravens, and were regarded with superstitious fear by the Luiseños. Internal pains were often said to be due to a person having been shot by a raven with one of these "arrows."

SPIRITS AND MONSTERS.

There is still a strong belief in a malevolent water spirit, yuyungviwut. It is thought to belong to both sexes. The male is believed to spirit women away at night to his home in the water, not bodily, but the soul or spirit of the woman, and there to treat her as his wife. The women say they are well treated while there, but have to eat animals that frequent water, such as frogs and snakes. It is usually, though by no means always, young unmarried women who are subject to this delusion, more especially those who are subject to epileptic fits. Women who imagine themselves to be under the dominion of the water spirit often become seriously ill, and are treated by the medicine-men, who claim to be able to frighten the spirit away when it approaches. They pretend to detect its presence by a smell resembling that of stagnant water, the spirit of course being invisible. We have known a medicine-man to be sent for from a distance of a hundred miles to treat a woman who imagined herself to be under the dominion of this spirit. And a strange thing is that women brought up almost entirely among the whites, and others with very little Indian blood, often suffer from this disease, or rather delusion.

Men also sometimes suffer from this delusion, imagining themselves to be under the dominion of a female yuyungviwut. As in the case of the women, they are usually those who are subject to epileptic fits. Many are so afraid of this spirit that they will not call it by its true name, but instead speak of it as an "animal of the water."

There is another water spirit, pavawut, that is believed to inhabit certain springs and ponds of water, which it is thought

to object to having people visit. For this reason many will not put their houses near springs, as they are afraid to incur the anger of this spirit by doing so. It is said sometimes to drag under the water people who bathe near its haunts and to drown them. It is also related that a man shot one at a spring at Santa Margarita, and that the spring immediately dried up. The man also died within a short time.⁶

A being known as koyul is said to have its abode at the main falls of Pauma creek, not the falls that visitors to Palomar mountain sometimes go to see, but others much lower down the cañon. It is thought to object to having people visit its abode, which is exceedingly difficult of access, and many are afraid to do so.

There is a tale to the effect that some twenty-five years ago a man who had been told of the existence of this animal, and warned not to go where it lived, declared that he was not afraid of it, that he would go where it was said to live, and shoot it if he should see it. So one day he entered the cañon and managed to get within a short distance of the falls, when he saw the animal sitting on a large rock directly above the fall. It looked like a very large toad, and was about the size of a man. He shot at it with a rifle he had taken along with him, when it at once jumped from the rock into a deep water-hole at the foot of the falls. As it struck the water a dense mist rose from it and filled the cañon so that it was impossible to see in any direction. At this the man was badly frightened, and would have left the cañon at once, but as he could not see anything, thought it best to wait until the mist cleared off. But though he waited and waited it did not do so, and at last he was obliged to grope his way back out of the cañon as best he could. Strange to say he did not die at once, as every one prophesied he would, but is still alive, or was a few years ago.

A meteor or shooting star is known by the name of Takwish, and is considered to be an animate being that carries people off and devours them. He is believed to have his abode at a locality in the San Jacinto mountains. There is a rocky peak on Palomar

⁶ A tradition recorded by Mr. Sparkman regarding the pavawut has been published in the *Journal of American Folk-Lore*, XXI, 35, 1908.

where it is said he pounds the flesh of his victims to make it tender before devouring it.

BOYS' PUBERTY CEREMONIES.

Puberty ceremonies were generally performed with several boys at once, always of the same clan. The feast-chief⁷ of the clan to which the boys belonged never performed the rites himself, but employed another to do so. This was usually the feast-chief of another clan, though any one outside of his own clan who understood the rites might be employed.

At the commencement the boys were given a small quantity of the juice of the roots of the toloache or jimson-weed, *Datura meteloides*. This soon stupefied them, and while they were in this condition dancing was kept up in a circle around them. As soon as they recovered they had to engage in the dance themselves, at the conclusion of which they were taken by the person in charge of the rites into the field, not to their homes. The following day they were required to bathe and be painted, and in the afternoon were taken to the dance again. This was kept up every day for a month, during which time they did not visit their homes.

Even after this period they were under certain restrictions for a year, not being allowed to eat either meat or salt for that time. At the close of the period of restriction the most important rites of all were performed.

A treble circle was drawn on the ground, with an opening on the side facing the north. The outer circle represented the milky way, the middle one night, and the inner one blood. A small pit, representing "hell," was made in the center of the treble circle, and figures of animals were made between this hole and the inner circle, as indicated in the illustration. (Pl. 20.) These figures were made by strewing sand on the ground.⁸

A long lecture or counsel was then given to the youths by the person in charge of the ceremonies. They were told to respect

⁷ "Feast-chief" is probably a translation of "capitan de fiesta"; by this term must be understood a chief of ceremonies, the "religious chief" mentioned in the paragraphs concerning government.

⁸ This sentence was left incomplete by the author, as if an addition had been intended.

their parents, and all grown-up people; not to shout in the presence of old men; and if an old person came to their house, to welcome him or her, and give them food and water, if they had any; if not, to tell them so politely. Also, if when out hunting they should kill a hare or rabbit, and an old man should ask them for it, they should hand it to him without being angry. They were told to bathe on rising in the morning (which it was formerly customary to do), to eat but little, and not to eat hurriedly, even when hungry. Also not to eat chia, venison, and jack-rabbit.⁹ If they did not heed the counsel given them, the bear and panther would kill them, the raven would shoot them with bow and arrow, if bitten by a rattlesnake in the field they would die right there, and they would also die if bitten by a black spider. Apmikat would lame them, make them blind, make boils break out on their bodies, or cause them to have consumption. The "breaker" would kill them, the stick would splinter them, and so on.

But if they did heed the counsel given them, they would kill the bear and panther and thereby gain fame. If bitten by a rattlesnake or black spider, they would not die, and if chased by a bear or panther they would not be overtaken. Illness would not attack them, their bodies would be active, and they would win races. They might even on rising to the sky after death live again as one of the stars, which it was said were formerly people. Still other inducements were held out to them to obey the counsel given them, and they were told that their actions were seen by the earth and sky.⁹

At the close of the lecture they were given some flour of white sage seeds mixed with salt. This they were required to chew and eject from their mouths into the small pit in the center of the circle. The lecturer examined this, and by its appearance pretended to tell whether the youth who ejected it had heeded the counsel given him or not. If dry he declared that he had done so, if moist, that he had not. In the latter case, shouts of disapprobation were made by the spectators, who were gathered around the edge of the outer circle.

⁹ These sentences were left incomplete by the author, as if additions had been intended.

The following is a literal translation of the lecture or counsel given to boys over the torohaish or tarohaish, ground painting.

See these, these are alive, this is bear panther; these are going to catch you if you are not good and do not respect your elder relations and grown up people. And if you do not believe, these are going to kill you; but if you do believe, everybody is going to see your goodness, and you then will kill bear panther. And you will gain fame and be praised, and your name will be heard everywhere.

See this, this is the raven, who will shoot you with bow and arrow, if you do not put out your winnowing basket. Hearken, do not be a dissembler, do not be heedless, do not eat food of overnight (*i.e.*, do not secretly eat food left after the last meal of the day). Also you will not get angry when you eat, nor must you be angry with your elder relations.

The earth hears you, the sky and wood-mountain see you. If you will believe this you will grow old. And you will see your sons and daughters, and you will counsel them in this manner, when you reach your old age. And if when hunting you should kill a hare or rabbit or deer, and an old man should ask you for it, you will hand it to him at once. Do not be angry when you give it, and do not throw it to him. And when he goes home he will praise you, and you will kill many, and you will be able to shoot straight with the bow.

This is a black-rattlesnake, this is going to bite you. Do not eat venison, do not eat jackrabbit, do not eat chia, do not shout in presence of old people. And if old people arrive at your house, you will welcome them at once. And if you have no food to give them, you will tell them so politely. And if you have, then you will give them some at once, also water. And when they arrive at their house, they will praise your goodness, and you will have a good name. And if a rattlesnake should bite you far off in the field, you will be able to arrive at your house. But if you should be wicked and heedless, you will not arrive; right there you will die in the field. And people will say that you are heedless, and that for that reason the rattlesnake bit you.

See this, this is a black-spider, this is going to bite you. Do not steal food of overnight, do not eat hurriedly when you are hungry. Also when you rise in the early morning you will bathe in the water, and you will always be active, and you will win when you run races. And the people will praise you, and you will shout, and will throw away food. And you will not eat much, or your body is going to be heavy, and you will get tired when you run races, and you will sting your foot with nettle.

See this, this (apmikat) is alive, this is going to break you, this is going to lame you, this is going to cause you to have boils on your body, this is going to make you blind, this is going to give you consumptive cough. In the early morning you will bathe, and if illness comes it will pass you by, also blood (*i.e.*, blood-vomiting sickness).

When you die your spirit will rise to the sky, and people will blow (three times) and will make rise your spirit. And everywhere it will be heard that you have died. And you will drink bitter medicine, and will vomit, and your inside will be clean, and illness will pass you by, and you will grow old,

if you heed this speech. This is what the people of long ago used to talk, that they used to counsel their sons and daughters. In this manner you will counsel your sons and daughters.

This is the breaker, this is going to kill you. Heed this speech and you will grow old. And they will say of you: He grew old because he heeded what he was told. And if you die at some future time you will be spoken of as those of the sky, like the stars. Those it is said were people, who went to the sky and escaped death. And like those will rise your soul (towish). In this manner you will counsel your sons and daughters, should you have any. Pay heed to this speech, that was spoken by the people of long ago.

See this, this is going to splinter you, this is going to give notice what you do, this is going to see you, this is going to know if you have bad thoughts. And if you marry, you will not approach your wife when she is menstruating. The rattlesnake is going to bite you, the stick is going to splinter you, consumption is going to catch you, the earth and sky are going to see if you do anything bad. Listen to this speech and you will grow up and become old. And you will think well of your elder relations, and they will say of you: He is good, whose son is he? In this manner you will counsel your sons and daughters.

And if a bear or panther will wish to catch you, they will not overtake you. And if a rattlesnake or black-spider should bite you, you will not die. But if you are heedless and a despiser, right there you will die. And your spirit (heart) will not rise to the north, or your soul (towish) to the sky.

GIRLS' PUBERTY CEREMONIES.

On arriving at the age of puberty a girl had formerly to undergo certain rites. A hole was dug in the ground several feet deep. In this stones were placed and a fire built to heat them. The stones were afterwards covered with coarse grass or brush, on top of which the girl was placed and covered over. She was kept here for three days and nights, only being taken out a short time each night to be fed, during which interval the stones were also reheated. During the time she was in the pit, dancing and singing was kept up around it. Several girls might be placed in the pit at the same time. It was only necessary that one of them should be of the correct age, the others might be younger. But it was imperative that all should belong to the same clan or family. The feast-chief of the clan to which the girl or girls belonged never performed the rites himself, but employed another who understood them to do so. As in the case of the boys' ceremony this was usually the feast-chief of another clan, though

any one outside of his own clan who understood the rites might be employed.

At the conclusion of the period during which the girl remained in the pit, her face was painted, and a similar painting was also made on a rock. At the end of a month the girl's face was painted in a different manner, and a similar painting was added to the first painting made on the rock. This was repeated every month for a year, each month a different painting being placed on the girl's face, and a similar one added to the original one on the rock. During this year the girl was prohibited from eating either meat or salt. At its close other rites were performed, and a lecture or counsel was given to the girl on much the same lines as that given to the boys. She was cautioned against being stingy, against dissembling, and against looking sidewise. She was also told not to eat jackrabbit or venison. After this lecture the girl was freed from all restrictions.

The girls' rites have not been performed in the upper San Luis Rey valley since 1890, and even then only a part of them were performed. The boys' rites have not been performed for about forty years. The prohibition of eating venison, jackrabbit, and chia was perhaps made because the old people wished these delicacies to be reserved for themselves.¹¹ The opening left on the north side of the circle of the ground-painting is symbolical of the direction the soul of a good person is supposed to take as it rises to the sky.

The following is a translation of the lecture or counsel given to girls at the puberty ceremonial, yuninish, literally "sprinkling."

See, these are alive, these will think well of you if you believe; and if you do not believe, they are going to kill you, if you are heedless, a dissembler, or stingy. You must not look sideways, must not receive a person in your house with anger, it is not proper. You will drink hot water when you menstruate, and when you are pregnant you will drink bitter medicine.

This will cause you to have your child quickly, as your inside will be clean. And you will roast yourself at the fire (after childbirth), and then your son or daughter will grow up quickly, and sickness will not approach you. But if you are heedless you will not bear your child quickly, and people will speak of your heedlessness.

¹¹ This may have been partly true, but in the main no doubt, if the Luiseños were like other uncivilized people, genuine religious beliefs were the principal motive.

Your elder relations you must think well of, you will also welcome your daughters-in-law and your brothers-in-law when they arrive at your house. Pay heed to this speech, and at some future time you will go to their house, and they are going to welcome you politely at their house. Do not rob food of overnight; if you have a child it will make him costive, it is also going to make your stomach swell, your eyes are also going to granulate. Pay attention to this speech, do not eat venison or jackrabbit, or your eyes are going to granulate, and people are going to know what you have done by your eyes. And as your son or daughter will grow up, you will bathe in water, and your hair will grow long, and you will not feel cold, and you will be fat, if you bathe in water. And after the puberty rite you will not scratch yourself with your hands, you will scratch yourself with a stick, your body is going to have pimples if you scratch yourself with your hands. Do not neglect to paint yourself, and people will see you, and you will grow old, if you pay attention to this speech, and you will see your sons and daughters.

See these old men and women, these are those who paid attention to this counsel, which is of the grown-up people, and they have already reached old age. Do not forget this that I am telling you, pay heed to this speech, and when you are old like these old people, you will counsel your sons and daughters in like manner, and you will die old. And your spirit will rise northwards to the sky, like the stars, moon, and sun. Perhaps they will speak of you and will blow (three times) and (thereby) cause to rise your spirit and soul to the sky.

MOURNING CEREMONIES AND MOURNING.

After the death of a husband his wife used to cut her hair short as a sign of mourning. Some follow this custom still. If a person was unmarried, some near relative might cut her hair off. A grandmother may do this on the death of a grandchild. Men never cut their hair as a sign of mourning.

When a person dies people blow three times, with the idea of assisting his soul or spirit (heart) to rise to the sky.

Before the arrival of the friars the dead were always cremated.

A religious ceremony of much importance is that of burning the clothes of deceased persons. This is generally held one year after their death. Some clans have now given up this practice, but others still keep it up. When the clothes of a person are to be burnt, the feast-chief of that clan does not perform the ceremony himself, but employs some one else to do so, usually the feast-chief of another clan. Large quantities of calico, and sometimes other articles, are given away at these ceremonies by those

of the deceased person's clan. But those of the same clan are not given any of these articles, only those of the clan of him who performs the ceremonies for the feast-chief.

At the image ceremony images are made of deceased relatives and are burnt. It is customary to give away many articles at this ceremony, but those of the clan to whom the deceased people belong do not receive any of the gifts.

Another religious ceremony which was formerly of great importance was the killing of an eagle or condor, usually the former. Usually a young eagle was taken from the nest when nearly full grown, and kept for some time in captivity, the feast-chief of the clan having charge of it, though others were expected to contribute food towards its support, such as rabbits and ground-squirrels, or, in more recent times, fowls if the former were not available. Sometimes an eagle might be shot for this ceremony, but a live bird was much preferred.

The golden eagle has regular nesting places, to which it is said to return every other year. Some of these places were considered to be the property of the clan, and it was not permissible for another clan to take eagles from them.

APPENDIX.

PLANTS USED BY THE LUISEÑOS.

The following is a list of plants known to have been utilized by the Luiseños for various purposes, with their Luiseño, botanical, and English names when known.

The writer is under obligations to Miss Alice Eastwood of the California Academy of Sciences for the identification of these plants. The equivalent Cahuilla names are from Dr. D. P. Barrows' *Ethno-Botany of the Cahuilla Indians of Southern California*.

Compositae. Sunflower Family.

Ambrosia artemisiaefolia. Pachavut. Used as an emetic.

Artemisia dracunculoides. Wachish. The seeds are used for food. The plant is used for medicinal purposes.

Artemisia heterophylla. Pakoshish. Mugwort. Small boys' arrows are sometimes made from this plant, and it is also used medicinally.

Carduus, species unknown. Chochawish. Thistle. Used as greens. The buds are also eaten raw.

Layia (or *Blepharipappus*) *glandulosa.* Solisal. Tidy-tips. The seeds are used for food.

Malacothrix Californica. Makiyal. The seeds are used for food.

Sonchus asper. Posi'kana. Sow thistle. Used for greens.

Helianthus annuus. Paukla. Wild sunflower. The seeds are used for food.

Pluchea borealis. Hangla. Arrow weed. Arrows are sometimes made from this plant. It was also formerly used to roof houses with.

Heterotheca grandiflora. Humut. The mainshafts of arrows are sometimes made from the tall stems of this plant.

Chrysoma (*Bigelovia*) *Parishii.* Sanmikut. The seeds are used for food. This plant is much used for medicinal purposes. Sanmikut kawingwish, literally, sanmikut of the mountain, is the name of a glutinous-leaved variety of the preceding. Its seeds are also used for food, and the plant itself medicinally.

Baccharis Douglasii. Morwaxpish. A decoction of the leaves is used to bathe sores and wounds. The wood of this shrub was that mostly used for drilling fire.

Cucurbitaceae. Gourd Family.

Cucurbita foetidissima. Wild squash. The seeds are used for food. The fruit is used when ripe as a substitute for soap.

Echinocystis macrocarpa. Enwish. Spanish, chilicothe. A purgative is made from the roots. The seeds are used in the manufacture of a red paint.

Caprifoliaceae. Honeysuckle Family.

Sambucus glauca. Kutpat. Elderberry. The fruit is much used for food, both fresh and dried. The wood is esteemed for making bows. The flowers are sometimes used as a remedy for female complaints. Cahuilla, hunkwat.

Orobanchaceae. Broom Rape Family.

Orobanche tuberosa. Mashal. Cancer root. The roots are used for food.

Scrophulariaceae. Figwort Family.

Adenostegia (or *Cordylanthus*). Yumayut. Used as an emetic.

Solanaceae. Nightshade Family.

Nicotiana, species unknown. Pavivut. Formerly used as tobacco. Cahuilla, pivat-isil, "coyote tobacco," *Nicotiana attenuata*.

Datura meteloides. Naktomush. Jimson-weed, thorn-apple; Spanish, toloache. The juice of the root was formerly used at the boys' puberty ceremony to induce stupefaction in the novices. Cahuilla, kikisowil.

Solanum Douglasii. Takovshish. Black nightshade. The leaves are used for greens. The juice of the berries is used for inflamed eyes, and also formerly used for tattooing.

Labiatae. Mint Family.

Monardella lanceolata. Huvawut. A tea is made from this plant which is used both medicinally and as a beverage.

Salvia carduacea. Palit. Thistle sage. The seeds are used for food.

Salvia columbariae. Pashal. Spanish, chia. The seeds are much esteemed for food. Cahuilla, pasal.

Micromeria Douglasii. Huvaumal. Yerba buena. A tea is made from this plant which is used partly as a beverage and partly as a medicine.

Ramona stachyoides. Kanavut. Black sage. The seeds are used for food.

Ramona (Auidibertia) polystachya. Kashil. White sage. The tops of the stems when tender are peeled and eaten uncooked. The seeds are eaten.

Cactaceae. Cactus Family.

Opuntia. Navut. This is the general name for the numerous species of the prickly-pear cactus with flat joints. The fruit is eaten both fresh and dried. The seeds are ground into meal and used for food. Cahuilla, navit; the fruit, navityuluku.

Mutal. A cactus with cylindrical stems. Cholla. Seeds used for food. Cahuilla, mutal; the seeds, wial.

Hydrophyllaceae. Phacelia Family.

Eriodictyon Parryi. Atovikut. Used for medicinal purposes.

Eriodictyon tomentosum or *crassifolium.* Palwut. Spanish, Yerba santa. Much valued for medicinal purposes.

Phacelia ramosissima. Sikimona. Used for greens.

Polemoniaceae. Gilia Family.

Gilia staminea. Chachwomal. The seeds are used for food.

Asclepiadaceae. Milkweed Family.

Asclepias eriocarpa. Tokmut. Milkweed. A string fiber is obtained from the stems. A chewing gum is made from the sap which exudes from the stems when cut. Cahuilla, *Asclepias erosa*, keat; *Asclepias sp.*, wichsal; chewing gum, chilse.

Philibertia heterophylla. Towunla. It is used for food, being eaten raw with salt.

Apocynaceae. Dogbane Family.

Apocynum cannabinum. Wicha. Indian hemp, dogbane. A string fiber is obtained from the bark. Cahuilla wish is *Phragmites communis*, also used for string.

Gentianaceae. Gentian Family.

Erythraea venusta. Ashoshkit. Spanish, Canchalagua. Tea made from this is used as a remedy for fever.

Ericaceae. Heather Family.

Arctostaphylos Parryi. Kolul. Manzanita. The pulp of the berries is ground and used for food. Cahuilla, fruit of *A. glauca*, tatuka.

Umbelliferae. Parsley Family.

Apium graveolens. Pa'kil. Common celery. Probably not native. Used for greens.

Deweya arguta. Kaiyat. The root is much esteemed for medicinal purposes.

Violaceae. Violet Family.

Viola pedunculata. Ashla. Violet. The leaves are used as greens.

Malvaceae. Mallow Family.

Sidalcea malvaeflora. Pashangal. Wild hollyhock. Used as greens.

Malvastrum sp. Kaukat. A decoction of the leaves is used as an emetic.

Vitaceae. Grape-vine Family.

Vitis girdiana. Makwit. Wild grape-vine. The fruit is cooked and used for food.

Anacardiaceae. Sumach Family.

Rhus trilobata. Shoal. Sumach, squaw bush, Indian lemonade. From this shrub are obtained the splints that are used to wrap the coil in Luiseño baskets. The berries are ground and used for food. A seed-fan for beating the seeds off plants is made from the twigs of this shrub. Cahuilla, the berry, selitto.

Rutaceae. Rue Family.

Cneoridium dumosum. Navish. Used for medicine.

Euphorbiaceae. Spurge Family.

Croton Californicus. Shuikawut. Said to be used to procure abortion.

Euphorbia polycarpa. Kenhamal. Spanish, Yerba golondrina. Reputed to be beneficial in the case of rattlesnake bites.

Leguminosae. Pea Family.

Psoralea orbicularis. Shi'kal. Used for greens.

Psoralea macrostachya. Pi'mukvul. A yellow dye is made from the roots of this plant; also a medicine for ulcers and sores.

Lotus strigosus. Tovinal. Used for greens.

Lupinus sp. Mawut. Used for greens.

Trifolium ciliolatum. Mukalwut. Eaten both cooked and raw. The seeds are also used.

Trifolium gracilentum. Ke'kesh. It is eaten both cooked and raw.

Trifolium microcephalum. Pehevi. It is eaten cooked.

Trifolium tridentatum. Chokat. Eaten both cooked and raw. The seeds are also used.

Trifolium obtusiflorum. Shoo'kut. It is eaten cooked.

Prosopis juliflora. Ela. Mesquite. The beans are ground into meal and used for food to a limited extent in some localities. Cahuilla, *Prosopis pubescens*, mesquite screw, kwinyal.

Rosaceae. Rose Family.

Adenostoma fasciculatum. U'ut. Chamisal. Foreshafts of arrows are made of this shrub. A gum, the deposit of a scale-insect, is also obtained from it. Cahuilla, oot.

Rubus parviflorus. Pavlash. Thimbleberry. The fruit is eaten.

Rubus vitifolius. Pikwax. Wild blackberry. The fruit is eaten. The juice of the berries is sometimes used to stain articles made of wood.

Prunus demissa. Atut. The fruit is eaten. Cahuilla, the fruit, atut.

Cerasus (Prunus) ilicifolia. Chamish. Spanish, Islaya. The fruit is eaten. The kernels are ground into flour and used for food. Cahuilla, chamish.

Heteromeles arbutifolia. Achawut. Toyon, Christmas berry. The berries are used for food.

Saxifragaceae. Saxifrage Family.

Ribes indecorum or *malvaceum.* Kawa'wal. The root is used to cure toothache.

Ribes speciosum.

Crassulaceae. Stonecrop Family.

Dudleya (Cotyledon). Topnal. Hen-and-chickens. The juice of the leaves is used.

Cruciferae. Mustard Family.

Brassica nigra. No Luiseño name. Black mustard. Probably not native. Much used for greens.

Lepidium nitidum. Pakil. Peppergrass. The seeds are used for food. The leaves are also used as greens.

Nasturtium officinale. No Luiseño name. Water-cress. Used for greens.

Papaveraceae. Poppy Family.

Eschscholtzia Californica. Ataushanut. California poppy. The leaves are used for greens. The flowers are chewed with chewing gum.

Ficoideae. Carpet-weed or Fig-marigold Family.

Mesembryanthemum aequilaterale. Panavut. Fig marigold. The fruit is eaten.

Portulacaceae. Purslane Family.

Portulaca oleracea. Pokut. Common purslane. Used for greens.

Calandrinia caulescens. Puchakla. Red Maids. Used when tender for greens. The seeds are also used for food.

Montia perfoliata. Towish popa'kwa. Indian lettuce. Used for greens and also eaten raw.

Nyctaginaceae. Four-o'clock Family.

Mirabilis Californica. Nanukvish or tisi. A decoction of the leaves is used as a purgative.

Chenopodiaceae. Pigweed Family.

Chenopodium album. Ket. Lamb's quarter, pigweed. The leaves are used for greens.

Chenopodium Californicum. Kahawut. Soap plant. The root is used for soap. The seeds are used for food. Cahuilla, kehawut.

Saururaceae. Lizard-tail Family.

Houttuynia (Anemopsis) Californica. Chevnash. Spanish, Yerba Mansa. A decoction of the root is used internally and externally.

Polygonaceae. Buckwheat Family.

Rumex, species unknown. Ipelwut. Dock. A decoction of the root is used medicinally.

Urticaceae. Nettle Family.

Urtica holosericea. Shakishla. Stinging nettle. A fiber is obtained from this, but is not much esteemed.

Cupuliferae. Oak Family.

Quercus Californica. Kwila. Black oak, Kellogg's oak. The acorns of this oak are more esteemed for food than those of any other species.

Quercus chrysolepsis. Wiat. Valparaiso oak, drooping live oak, golden cup oak. Acorns esteemed for food, though not so much as those of *Quercus agrifolia* and *Californica*. A gambling toy is made from the large acorn-cups of this oak.

Quercus dumosa. Pawish. Acorns little esteemed for food. The gall-nuts are used to doctor sores and wounds. They are said to possess powerfully astringent properties. Cahuilla, the acorn, kwinyil.

Quercus Engelmanni. Tovashal. White oak. Acorns little esteemed for food. From a deposit made on this oak by a scale insect a chewing gum is obtained. A fungus growing on its decayed wood was formerly used for tinder, when fire was kindled with flint and steel.

Quercus agrifolia. Wiashal. Live oak, red oak, field oak, encina. Acorns esteemed for food, though not so much as those of *Quercus Californica*.

Quercus Wislizeni. I'mushla. Acorns little esteemed for food.

Salicaceae. Willow Family.

Populus Fremonti (probably). Avahut. Cottonwood. Inner bark formerly used to make apron-like garment worn behind by women.

Salix sp. Willow. Wood much used for making bows.

Iridaceae. Iris Family.

Sisyrinchium bellum. Patumkut. Blue-eyed grass. A purgative is made from the roots.

Liliaceae. Lily Family.

Bloomeria aurea. Kawichhal. The bulb is eaten.

Brodiaea capitata. Tokapish. Wild hyacinth. The bulb is eaten.

Chlorogalum parviflorum. Kenut. The bulb is eaten.

Chlorogalum pomeridianum. The fibers covering the bulb are used to make a brush.

Yucca Mohavensis. Hunuvut. The flowers are boiled and eaten. The pods are roasted and eaten. The fiber of this plant is little used by the Luiseños. Cahuilla, hunuvut; the fruit, ninyil.

Yucca Whipplei. Panal. Spanish bayonet or Spanish dagger. The head is used for food. The flowers are boiled and eaten. The scape or stalk is also used for food. Cahuilla, the stalk, panuul; the seed-bags, wawal.

Juncaceae. Rush Family.

Juncus Mertensianus. Pivut. An openwork basket is made from this rush. It is used for gathering acorns, cactus, etc. Another basket made from it is used to cook acorn meal, and another is used as a sieve.

Juncus sp. Shoila. The lower part of this rush furnishes the brown color seen in Luiseño baskets. A mat is also made from it in which articles used at religious ceremonies are kept by the religious chief of the clan. Cahuilla, seil.

Cyperaceae. Sedge Family.

Scirpus sp. Pevesash. Bulrush, tule. The tender young shoots are eaten raw.

Gramineae. Grass Family.

Avena fatua. Arus or Urus. Wild oats. The seed is ground into flour and used for food.

Bromus maximus. Woshhat. The seeds are used for food.

Elymus condensatus. Huikish. The mainshafts of arrows are made from this plant. Cahuilla, pahankis.

Epicampes rigens Californica. Yulalish. The body of the coil of Luiseño baskets is composed of this grass. Cahuilla, *Cinna macroura* (synonym), suul.

Cryptogamia.

Pellaea ornithopus. Wikunmal. Tea fern, bird-claw fern. A decoction of the fronds is used medicinally, and also as a beverage by people who are not ill.

Woodwardia radicans (probably). Mashla. Brake fern. A decoction of the root is used both externally and internally to relieve pain from injuries to the body.

Shakapish. Tree mushroom. Much esteemed for food when growing on cottonwood and willow trees.

UNIVERSITY OF CALIFORNIA PUBLICATIONS—(CONTINUED)

AMERICAN ARCHAEOLOGY AND ETHNOLOGY.—Continued.

- Vol. 7. No. 1. The Emeryville Shellmound, by Max Uhle. Pages 106, Plates 12, June, 1907. Price, 1.25
- No. 2. Recent Investigations bearing on the Question of the Occurrence of Neocene Man in the Auriferous Gravels of the Sierra Nevada, by William J. Sinclair. Pages 25, Plates 2, February, 1908. Price, .35
- No. 3. Pomo Indian Basketry, by S. A. Barrett (in press).
- Vol. 8. No. 1. A Mission Record of the California Indians, from a Manuscript in the Bancroft Library, by A. L. Kroeber. Pages 27, May, 1908. Price, .25
- No. 2. The Ethnography of the Cahuilla Indians, by A. L. Kroeber. Pages 40, Plates 15, June, 1908. Price, .75
- No. 3. The Religion of the Luiseño Indians of Southern California, by Constance Goddard DuBois. Pages 118, Plates 4, June, 1908. Price, 1.25
- No. 4. The Culture of the Luiseño Indians, by Philip Stedman Sparkman. Pages 48, Plate 1, August, 1908. Price, .50
- Vol. 9. No. 1. Yana Texts, by Edward Sapir (in press).

GRAECO-ROMAN ARCHAEOLOGY. (Large Octavo).

(Published by the Oxford University Press.)

- Vol. 1. The Tebtunis Papyri, Part 1. 1902. Edited by Bernard P. Grenfell, Arthur S. Hunt, and J. Gilbert Smyly. xix + 674 pages, with 9 plates. Price, \$16.00
- Vol. 2. The Tebtunis Papyri, Part 2. 1907. Edited by Bernard P. Grenfell, Arthur S. Hunt, and Edgar J. Goodspeed. xv + 485 pages, with 2 colotype plates and a map. Price, 16.00
- Vol. 3. The Tebtunis Papyri, Part 3 (in preparation).

EGYPTIAN ARCHAEOLOGY. (Quarto).

- Vol. 1. The Hearst Medical Papyrus. Edited by G. A. Reisner. Hieratic text in 17 facsimile plates in colotype, with introduction and vocabulary, pages 48, 1905. (J. C. Hinrichs, Leipzig, 25 Marks) Price, \$8.00
- Vol. 2. Early Dynastic Cemeteries of Naga-ed-Dér, Part I, by George A. Reisner. xii + 160 pages, with 80 plates and 211 text figures. 1908 (J. C. Hinrichs, Leipzig, 50 marks). Price, 16.00
- Vol. 3. The Early Dynastic Cemeteries at Naga-ed-Der. Part II. By A. C. Mace. (in press.)
- Vol. 4. The Predynastic Cemetery at Naga-ed-Der. The Anatomical Material, by Elliott Smith (in preparation).
- Vol. 5. The Cemetery of the Second and Third Dynasties at Naga-ed-Der, by A. C. Mace (in press).
- Vol. 6. The Cemetery of the Third and Fourth Dynasties at Naga-ed-Der, by G. A. Reisner (in preparation).
- Vol. 7. The Coptic Cemeteries of Naga-ed-Der, by A. C. Mace (in preparation).

SPECIAL VOLUMES.

The Book of the Life of the Ancient Mexicans, containing an account of their rites and superstitions; an anonymous Hispano-American manuscript preserved in the Biblioteca Nazionale Centrale, Florence, Italy. Reproduced in fac-simile, with introduction, translation, and commentary, by Zelia Nuttall.

Part I. Preface, Introduction, and 80 Fac-simile plates in colors. 1903.

Part II. Translation and Commentary. (In press).

Price for the two parts \$25.00

Facsimile of a Map of the City and Valley of Mexico, by Alonzo de Santa Cruz, Cosmographer of Philip II of Spain. Explanatory text by Zelia Nuttall. Map in 7 sheets, 17×20 inches. (in preparation).

The Department of Anthropology, Its History and Plan, 1905. Sent free on application to the Department, or to the University Press.

European orders for numbers of the series in American Archaeology and Ethnology may be addressed to Otto Harrassowitz, Leipzig, or R. Friedländer & Sohn, Berlin.

UNIVERSITY OF CALIFORNIA PUBLICATIONS

Note.—The University of California Publications are offered in exchange for the publications of learned societies and institutions, universities and libraries. Complete lists of all the publications of the University will be sent upon request. For sample copies, lists of publications or other information, address the **Manager of the University Press, Berkeley, California, U. S. A.** All matter sent in exchange should be addressed to **The Exchange Department, University Library, Berkeley, California, U. S. A.**

- ASTRONOMY.**—W. W. Campbell, Editor. (Lick Observatory, Mt. Hamilton, Cal.)
Publications of the Lick Observatory.—Volumes I–V completed. Volumes VII and IX in progress. Volume VIII in press.
- BOTANY.**—W. A. Setchell, Editor. Price per volume \$3.50. Volumes I (pp. 418), II (pp. 354), completed. Volume III (in progress).
- CLASSICAL PHILOLOGY.**—Edward B. Clapp, William A. Merrill, Herbert C. Nutting, Editors. Price per volume \$2.00. Volume I (in progress).
- ECONOMICS.**—A. C. Miller, Editor.
- EDUCATION.**—Edited by the Department of Education. Price per volume \$2.50.
- ENGINEERING.**—Edited under the direction of the Engineering Departments. This series will contain contributions from the Colleges of Mechanics, Mining, and Civil Engineering. Volume I in progress.
- GEOLOGY.**—Bulletin of the Department of Geology. Andrew C. Lawson, Editor. Price per volume \$3.50. Volumes I (pp. 428), II (pp. 450), III (475) and IV (462), completed. Volume V (in progress).
- PATHOLOGY.**—Alonzo Englebert Taylor, Editor. Price per volume, \$2.50. Volume I (pp. 347) completed.
- PHILOSOPHY.**—Volume I, completed. Price, \$2.00.
- PHYSIOLOGY.**—Jacques Loeb, Editor. Price per volume \$2.00. Volume I (pp. 217) completed. Volume II (pp. 215) completed. Volume III (in progress).
- ZOOLOGY.**—W. E. Ritter, Editor. Price per volume \$3.50. Volumes I (pp. 317), II (pp. 382) and III (pp. 383) completed. Volume IV in progress. Commencing with Volume II, this series contains Contributions from the Laboratory of the Marine Biological Association of San Diego.
- UNIVERSITY OF CALIFORNIA CHRONICLE.**—An official record of University life, issued quarterly, edited by a committee of the faculty. Price, \$1.00 per year. Current volume No. X.
- ADMINISTRATIVE BULLETINS OF THE UNIVERSITY OF CALIFORNIA.**—Edited by the Recorder of the Faculties. Includes the Register, the President's Report, the Secretary's Report, and other official announcements.

Address all orders, or requests for information concerning the above publications to **The University Press, Berkeley, California.**

European agent for the series in American Archaeology and Ethnology, Classical Philology, Education, Philosophy, and Semitic Philology, **Otto Harrassowitz, Leipzig.** For the series in Botany, Geology, Pathology, Physiology, Zoology and also American Archaeology and Ethnology, **R. Friedlaender & Sohn, Berlin.**