PLAINTIFF'S EXHIBIT 2

Sekaquaptewa v. MacDonald
Civil No. 74-842 Prescott

Indian Claims Commission
Docket 196 (Hopi)
Ex. E 51b

HOPI

INDIAN CLAIMS COMMISSION

NO. 196

THE HOPI

THEIR HISTORY AND USE OF LANDS

BY

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Hopi Report

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I

Introducing the Hopi:

A Brief Resumé of the Hopi Towns and their Early Contacts with Whites.

The Hopi have been more isolated and less acculturated than any of the other Pueblos, a matter of their geography and their independence. The first knowledge of the Hopi came to Europeans in 1540, when Don Pedro de Tovar led a small detachment on a visit to the Hopi towns. In 1582, Antonio de Espejo, a Spanish merchant from north Mexico, organized an expedition to search for two friars who had remained in the Rio Grande area as missionaries when the expedition they accompanied returned to Mexico, two years earlier. When Espejo found the missionaries had been murdered, he decided to do some silver prospecting before returning to Mexico. He went to Zuni and on to Hopi, where he visited Awatobi, Walpi, Shungopovi, Mishongnovi, and Oraibi. From there the group went farther westward, passing the San Francisco Mountains, and then returning to New Mexico after a second stop at Awatobi.

The Hopi towns were taken in possession for the King of Spain by Oñate in 1598. From Oraibi he sent Captains Farfan and Quesada to seek mines farther to the southwest. They crossed the Little Colorado, which they called the Rio de la Alameda, and passed south of the San Francisco Peaks, which they referred to as Sierra sin Agua. In 1604 Oñate himself followed this approximate route in moving toward the mouth of the Colorado.

In 1629 the Franciscans established a series of three missions in the Hopi towns, the Mission of San Bernadino at Awatobi, the Mission of San

Bartolome at Shungopovi, and the Mission of San Francisco at Oraibi. Chapels were built at Mishongnovi and Walpi, to be visited by a priest from Shungopovi. In 1680 the Hopi joined the Pueblos of New Mexico in a general uprising, the Pueblo Rebellion. The Hopi killed the missionaries and expelled the Spaniards. The Spaniards never again became established in northern Arizona, although about 1700 a priest returned to the Hopi area and was accepted by the people of Awatobi. However, there is evidence that factionalism, undoubtedly religious, existed here. The town chief, apparently a conservative, accused his people of being witches (a common accusation against those disliked or disapproved by others in a pueblo) and unwilling to cooperate with him. Finally he took his problem to other conservative leaders on First Mesa, and - obviously thoroughly disgruntled about the matter - promised to open a passageway into the town, customarily closed at night, if the people of First Mesa would come over, attack and destroy his people while they were busy preparing for a ceremony. The Hopi of Walpi and Mishongnovi, sometime during the winter of 1700-1701, came to Awatobi one night, destroyed the village, killed the men, and took the women and children back to their own pueblos. Awatobi was never re-occupied.

In 1692 de Vargas returned to reconquer New Mexico, and after Santa Fe was reestablished and the settlers had taken over most of the good land, the governor was told that another group of Spaniards was on their way north from Mexico. He decided that the best place in which to locate this new group was the area at the time occupied by two Tano (southern Tewa) pueblos in the Santa Cruz Valley north of Santa Fe. Upon learning that they had to move, most of these Tano people accepted a Hopi invitation to move over to their mesas, with the understanding that they would receive

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land in exchange for fighting the raiders when they appeared. Hano, on First Mesa, thus was established. Payupki was established on a finger of Second Mesa, four miles north of Mishongnovi, by another group which came from the Rio Grande. The village was attacked in 1706 by Capt. Holguin and his Spanish troops but the Hopis came to their aid and the Spaniards were driven from the country. In 1842 two priests, Pino and Delgado, came to Hopi and persuaded the people of Payupki to return to their old home on the Rio Grande.

Father Escalante spent eight days in the Hopi towns in 1775, made a report on their population, and suggested how they might be conquered. In 1776 Father Garces, head of the Franciscan mission of San Xavier del Bac just south of Tucson, went to Cataract Canyon and then eastward, across the Little Colorado north of Cameron, and on to Oraibi, where he was most inhospitably received, and so within a few days he withdrew.

Between 1777 and 1780 such a severe drought struck that hundreds of Hopis died of starvation. Two pueblos were abandoned, the remaining people scattering. The Indians considered this to be a punishment for the disrespect they had shown Father Garces and thought they were doomed. The Hopis appealed to Gov. Anza in New Mexico and the latter took food to them and tried to persuade them to return to New Mexico to settle. This appeared to be the Spaniards' chance to get the Hopi under their control, as they long had been hoping, but the Hopi preferred the risk of starvation to leaving their own homeland. It was almost 75 years before whites again visited the Hopi, as far as records show. In 1821 Mexico became a republic and was too concerned over matters closer to home to worry over the independent and still unconquered Hopi. (Colton, H.S., Days in the Painted Desert and the

San Francisco Mountains, Museum of Northern Arizona, Bull. 2, 1932, pp. 23-26).

Raids on the Hopi appear to have begun in the 1700's and continued in the following century; the raiders, at various times, were Navahos, Utes, Paiutes, and Apaches. Raids increased after the Mexican Revolt of 1823 because the new government had no military power in the Southwest. In 1853-'54 the Hopi were beset by a severe drought and an epidemic of smallpox, both of which reoccurred ten years later. The Hopi population of 1861, estimated by the United States Indian Agent, Ward, was 2500, about 60% less than that of 1853, prior to the smallpox epidemic, estimated by Leroux. (See Donaldson, 1893, pp. 14, 15, 35; Footnote 12, Chap. 2, Thompson, Laura, The Hopi Way, 1944).

Between 1858 and '65, the Mormon missionaries attempted to persuade the Hopi to move to Utah. The U.S. Government sent supplies, and in 1866 the American Indian Agent in Arizona tried to have them move to the Tonto Basin, south of Flagstaff. The Hopi accepted neither suggestion, but by 1867, some were in such dire straits that about 30 of them sought temporary refuge in Zuni and in other pueblos. But as soon as they had regained some strength and fortitude, most of the refugees returned to their home mesas. A number of Zuni traits were brought back with them, including certain ceremonials and some distinct similarities to Zuni pottery decoration. (Thompson, Op. cit.; Bartlett, Katherine, "Spanish Contacts with the Hopi", Museum of Northern Arizona, Museum Notes, Vol. 6, pp. 55-59). The pueblo of Sishomovi, which had been abandoned because of the smallpox epidemic, was resettled in part by Zunis, according

to both Hopi and Zuni tradition (Thompson, Op. cit., Note 13, Chap. 2; Fewkes, J.E., Hopi Katchinas, ARBAE, Vol. 21, p. 26; Hargrave, L., First Mesa, MNMNA, Vol. 3, p. 6). The ceremonials have remained but the Zuni style disappeared from the pottery when Nampeyo introduced the renaissance of the old Sikyatki shapes and designs in Hopi pottery in the late 1800's.

The first contact between Hopis and Americans was unofficial: in 1834 a party of fur trappers plundered the Hopi gardens and killed 15 or 20 Hopis. After the United States acquired the New Mexico-Arizona area, Lt. Sitgreaves was ordered to see whether the Zuni river and the Little Colorado were navigable to the sea. In 1851 he followed these down to Grand Falls, concluded that the venture was quite impossible, and cut north of the San Francisco Mountains and west to California. In 1853, Lt. A. W. Whipple crossed Arizona near the 35th parallel, south of the San Francisco Peaks, in making a preliminary survey of a railway route to California. In 1854, Aubrey crossed the plateau north of the San Francisco Mountains. In 1857, E. F. Beale, then Superintendent of Indian Affairs for California, was authorized to seek a route and build a wagon road from the head of steamboat navigation on the Arkansas River to California. He followed Whipple's route south of the San Francisco Peaks, approximately the present route of the Santa Fe railroad, introducing camels as well as mules and wagons into his train in an experiment on their adaptability to the southwestern terrain. (The experiment was not a success because the rocky surface of the ground was much harder on the feet of the beasts than the sandy soil of the African deserts.)

In 1858, Lt. Ives and J. S. Newberry took a boat up the Colorado and then started overland from Needles to Ft. Defiance, New Mexico. Ives made

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a side trip to visit the Hopi and is the first American to have left a record of his visit, though LeRoux, who had been with the Sitgreaves expedition, is said to have visited them in 1850.

Lt. Ives' description of the Hopi, as he saw them shortly after the opening of the American period, is of considerable interest as an introduction to these people, their use of the area and condition of the land, and their contacts with the Navaho:

> As the sun went down, and the confused glare and mirage disappeared, I discovered with a spy glass two of the Moquis towns [on Second Mesa] eight or ten miles distant, upon the summit of a high bluff overhanging the opposite side of the valley. They were built close to the edge of the precipice, and being of the same color as the mesa, it would have been difficult to distinguish them even with a glass, but for the vertical and horizontal lines of the walls and buildings. The outlines of the closely-packed structures looked in the distance like the towers and battlements of a castle, and their commanding position enhanced the picturesque effect. When darkness fell, camp fires -- probably those of the Moquis herdsmen -- could be seen scattered along the further side of the valley.
>
> Camp 93, Moquis pueblos, May 11. --The trail crossed the valley, making straight for the pueblos. For six miles not a sign of life was perceived; but while ascending a hill near the base of the bluff two mounted Indians and one small horse charged suddenly upon us, the riders shouting vociferous welcomes, and each insisting upon shaking hands with the whole company. One of them was respectably dressed. He had on a blue coat, cotton pants, a hat, a belt of circular brass plates, and a variety of ornaments. In his hand was a flint-lock musket of ancient pattern. The little horse they rode was nearly as thin as our mules, but garnished with red trimmings and a Mexican saddle and bridle. The most remarkable feature about both was their neatness. Their hair was finer than is usual with the race, and carefully combed. They were arrayed, to be sure, in their best attire, but cleanliness is seldom considered by Indians as forming any part of the most elaborate toilet.
>
> I asked the leader to be directed to water, and he pointed to a gap where a ravine appeared to run up the bluff rather behind the pueblos, and signified that there we would find an abundance. He further informed me that there was an excellent grass camp at the same place. A great deal of

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pantomine brought about this understanding, and then he signified that we must leave the trail and follow him, which we accordingly did. . .

Our new friend had a pleasant, intelligent face which expressed, however, misgivings as to our character and object in coming into that unvisited region. He rode along humming to himself, with a palpable affectation of being cool and unconcerned, occasionally glancing back with a dubious air to see what was going on behind. The two who had been selected to bear the brunt of the first interview had, I suppose, brought the horse as a means of escape, for soon others of the tribe, satisfied of our pacific intentions, came up on foot. All were running at the top of their speed. They approached to the very sides of the mules, greatly to the alarm of those animals, and suddenly brought up to shake hands, commencing with me, and continuing through the train. They were clean and nice looking; no particular costume prevailed. Every available article acquired by trading with other Indians - for they have no communication with whites - had been converted into raiment or material for personal adornment. Their figures were of medium size and indifferently proportioned, their features strongly marked and homely, with an expression generally bright and good-natured. Thirty or forty joined us, and the cortege in a little while became of considerable length.

The face of the bluff, upon the summit of which the town was perched, was cut up and irregular. We were led through a passage that wound among some low hillocks of sand and rock that extended half-way to the top. Large flocks of sheep were passed; all but one or two were jet black, presenting, when together, a singular appearance. It did not seem possible, while ascending through the sand-hills, that a spring could be found in such a dry looking place, but presently a crowd was seen collected upon a mound before a small plateau, in the centre of which was a circular reservoir, fifty feet in diameter, lined with masonry, and filled with pure cold water. The basin was fed from a pipe connecting with some source of supply upon the summit of the mesa. The Moquis looked amiably on while the mules were quenching their thirst, and then my guide informed me that he would conduct us to a grazing camp. Continuing to ascend we came to another reservoir, smaller but of more elaborate construction and finish. From this, the guide said, they got their drinking water, the other reservoir being intended for animals. Between the two the face of the bluff had been ingeniously converted into terraces. These were faced with neat masonry, and contained gardens, each surrounded with a raised edge so as to retain water upon the surface. Pipes from the reservoirs permitted them at any time to be irrigated.

Peach trees were growing upon the terraces and in the hollows below. A long flight of stone steps, with sharp turns that could easily be defended, was built into the face of the precipice, and led from the upper reservoir to the foot of the town. The scene, rendered animated by the throngs of Indians in their gaily-colored dresses, was one of the most remarkable I had ever witnessed. My state of admiration was interrupted by the guide, who told me, to my astonishment, that we had reached the camp-ground. Besides the danger of the mules trampling upon and ruining their gardens, it was no place to stop, inasmuch as there was not a blade of grass. I called the attention of the Indian to the latter fact, which he did not appear to have considered. While he was reflecting upon the matter, we were joined by a pleasant looking middle-aged man with a shell suspended to his neck and a kind of baton in his hand, whom I supposed to be a chief. Like the rest, he shook hands all around, and held a consultation with the guide and with the crowd generally about the grass. They finally concluded that there was plenty a little further ahead, and we proceeded around the ascent by a side trail that led away from the pueblo. In ten minutes a spot was reached which all agreed was the best grazing the country afforded. I no longer [wondered] that their one horse looked so thin. A single animal could scarcely have existed for three days upon all the grass in the neighborhood. Some distance back in the valley I had seen a small patch of grass, and now signified to the troubled looking Indians that I would send the train back, and let the mules be driven to the reservoir when they needed water. I also told them that Dr. Newberry, Mr. Egloffstein, and myself would visit their houses before following the rest of the party to the camp. This arrangement seemed satisfactory, and the chief, accompanied by several friends, led the way with an inconvenient alacrity, considering the steepness of the ascent. The stone steps being surmounted, we came upon a level summit, and had the walls of the pueblo upon one side and an extensive and beautiful view upon the other. Without giving us time to admire the scene, the Indians led us to a ladder planted against the centre of the front face of the pueblo. The town is nearly square, and surrounded by a stone wall fifteen feet high, the top of which forms a landing extending around the whole. Flights of stone steps led from the first to a second landing, upon which the doors of the houses open. Mounting the stairway opposite to the ladder, the chief crossed to the nearest door and ushered us into a low apartment from which two or three others opened towards the interior of the dwelling. Our host courteously asked us to be seated upon some skins

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spread along the floor against the wall, and presently his wife brought in a vase of water and a tray filled with a singular substance that looked more like sheets of thin blue wrapping paper rolled up into bundles than anything else that I had ever seen. I learned afterward that it was made from corn meal, ground very fine, made into a gruel, and poured over a heated stone to be baked. When dry it has a surface slightly polished, like paper. The sheets are folded and rolled together, and form the staple article of food with the Moquis Indians.

As the dish was intended for our entertainment, and looked clean, we all partook of it. It had a delicate fresh-bread flavor, and was not at all unpalatable, particularly when eaten with salt. After we had eaten and drank, Mr. Egloffstein took a pipe from his pocket, which was filled and passed around. I noticed, then and afterwards, that the Moquis, when commencing to smoke, bow with solemnity towards each point of the compass. While they were engaged with the pipe we had a chance to examine the contents of the apartment. The room was fifteen feet by ten; the walls were made of adobes; the partitions of substantial beams, the floor laid with clay. In one corner were a fireplace and chimney. Everything was clean and tidy. Skins, bows and arrows, quivers, antlers, blankets, articles of clothing and ornament, were hanging from the walls or arranged upon shelves. Vases, flat dishes, and gourd filled with meal or water were standing along one side of the room. At the other end was a trough divided into compartments, in each of which was a sloping stone slab two or three feet square for grinding corn upon. In a recess of an inner room was piled a goodly store of corn in the ear. I noticed, among other things, a reed musical instrument with a bell-shaped end like a clarionet, and a pair of painted drumsticks tipped with gaudy feathers. Another inner room appeared to be a sleeping apartment, but this being occupied by females we did not enter, though the Indians seemed to be pleased rather than otherwise at the curiosity evinced during the close inspection of their dwelling and furniture.

. . . Then we went out upon the landing, and by another flight of steps ascended to the roof, where we beheld a magnificent panorama. The San Francisco Mountain, the valley and canon of Flax River [the Little Colorado], and plateaus to the north and east were all visible, the most distant objects appearing distinct and well defined through the transparent atmosphere. Several trails radiated from the foot of the bluff in perfectly straight lines, and could be traced a long way over the level surface. One conducted to the canon of Flax River and doubtless to the Yampais village; another, the chief told us, was the trail of the Apaches;

we had ascended. The sheep were soon forthcoming, according to agreement, and several brought bags of corn and little packages of dried peaches to trade. Some beautiful and really valuable Navajo blankets were also offered, and readily exchanged for a woolen shirt, or some common article of apparel. . . .

Camp 94, Oraybe, May 12.--This morning the Moquis were in camp exhibiting an insatiable curiosity to see everything that was going on... Corn meal was brought in for trade, and one individual opening his blanket disclosed a dozen fresh eggs, for which he found a ready sale.

.... Under the guidance of the lad we followed a sinuous and difficult road through the hills that form the slope from the bluffs to the plain below. The trail led close to a second town whose inhabitants were gathered on the walls and housetops to gaze at us as we passed.

Two more reservoirs were seen, and several gardens and peach orchards. A few miles tedious traveling brought us to the edge of the valley.

... The country now traversed was the most promising looking for agricultural purposes of any yet seen. It had nearly all been under cultivation. Immense fields were passed, and our guide stopped constantly to gossip with his neighbors who were busy planting corn.

Their method of doing this was very primitive. With a sharp stick a hole was punched in the ground a foot deep, and the corn dropped in and covered up. No women were engaged in the labor. Unlike other tribes of Indians, the men do the out-of-door work, leaving to the females the care of the households, the spinning, weaving, sewing, etc. At the end of a few miles Oraybe came in sight; it was larger than the other pueblos. Though we had made but a short march, several mules gave out and could not be driven even without their packs. The scanty grass of the three preceding days had taken away the remnant of strength left to them. We had to camp, though the pasturage was neither good nor abundant.

The Oraybe reservoirs are a mile or two distant.

Ives goes on to tell of the objections the Oraibi chief made to the proposal of the American party that they make the four days trip northwestward to the Colorado river; he insisted that water was not available on that trail at the time and appeared disgusted when Ives still insisted upon starting. With the guide provided, the Americans started northward on the east side of the bluff on which Oraibi stands.

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> Eight or nine miles brought the train to an angle formed by two faces of the precipice. At the foot was a reservoir, and a broad road winding up the steep ascent. On either side the bluffs were cut into terraces and laid out into gardens similar to those seen at Mooshahneh [Mishongnovi], and, like them, irrigated from an upper reservoir. The whole reflected great credit upon Moquis ingenuity and skill in the department of engineering. The walls of the terraces and reservoirs were of partially dressed stone, well and strongly built, and the irrigating pipes conveniently arranged. The little gardens were neatly laid out. Two or three men and as many women were working in them as we passed. . . . . While on the road today the guide pointed out a place where the Navajoes had recently made a descent upon the Moquis flocks. He had himself been herding at the time, and showed me two scars upon his sides from wounds received in the engagement. The herders had been utterly routed, and retreated to their pueblo, while the conquerors made off with all their stock.

The guide left but Ives continued:

> Preferring to see for ourselves the condition of the country, we pursued the same general course as before, towards the northwest. The top of the mesa on which we had been encamped proved to be very narrow, and before we had traveled a mile we came to its northern edge, where there were the usual precipice and foot-hills forming the descent to a broad valley. Here, also, the bluffs had been formed into terraced gardens and reservoirs.

These gardens would have been one day's trip - probably ten or twelve miles, considering the condition of Ives' mules at the time (they broke down after ten miles on the following day) - northwest of Oraibi. Here Ives sent out scouts to check on the water situation. They found evidence of a previously occupied Indian camp, whether Pueblo or Navaho is not indicated, but no water. The party returned to Oraibi, where they found the chief gratified that the Americans had found the trip as impractical as he had predicted.

> Several of the tribe have been working in the gardens and tending the sheep during the day. In the former labor the women as well as the men assist. The walls of the

> terraces and the gardens themselves are kept in good order and preservation. The stone and earth for construction and repairs they carry on blankets upon their shoulders from the valley below. The soil is of a poor character, and the amount which they extract from it speaks well for their perseverance and industry. Both turkeys and chickens have been seen in the pueblos.

Ives asked to be guided to the ~~Third~~ First Mesa, and on a short cut ascended a very steep mesa.

> Beyond was a valley nine or ten miles wide, and upon the opposite side a plateau with three Moquis towns standing in a line upon the top. We camped three miles from them; sending the mules to their reservoir for water. The valley was well covered with grass. Large flocks of sheep attested to the wealth of the citizens of this department of Moquis. Almost the entire population came to see us, evincing the greatest curiosity at everything they witnessed. In dress and general appearance they have a smarter look than the citizens of the other towns, and seem to be more well-to-do in the world. . . The men wear loose cotton trowsers, and frequently a kind of blouse for an upper garment, over which they throw a blanket. The dress of the women is invariably a loose black woolen gown, with a gold-colored stripe around the waist and the bottom of the skirt. The stripe is of cotton, which they grow in small quantities. The material of the dress is of their own weaving.

Ives was much surprised to find that the Navahos had ridden in to visit and trade with the Hopis so soon after the recent foray. When the Americans decided to move on eastward to Fort Defiance, several Hopis accompanied them and numerous Navahos joined the party. They traveled for one day (distance unstated), and 24 miles on the next day, where they reached water and camped. This was stated to be the edge of the Navaho region. The apparent surface friendship between Hopis and Navahos still further puzzled Ives when the Tewa chief (from Hano pueblo on First Mesa) told him that the night before the same Navaho who accomapnied them had stolen some Hopi stock and that they were a "bad lot". One Navaho stole a trunkful of field notes from the Ives party but, fortunately for posterity,

Major Brook, commanding the post at Ft. Wingate, quickly retrieved it. (Ives, Joseph C. Report Upon the Colorado River of the West, 36 Cong. House of Representatives Ex. Doc., 1861, pp. 119-131.)

A few months after Ives' visit, Jacob Hamlin, a Mormon missionary to the Indians, crossed the Colorado river at Ute Ford (also known as the Crossing of the Fathers) just north of the present southern boundary of Utah, and visited the Hopis. He made a number of trips into northern Arizona in the following years, exploring and locating Lee's ferry as a practical wagon crossing of the Colorado. Attempts to establish towns along the Little Colorado were made, but all except those founded along the upper stretches of that river in the 1870's later were abandoned. (Colton, 1932.)

In 1863 Arizona was made a territory and John N. Goodwin, appointed governor, entered Arizona with a party of immigrants and proceeded to establish the city of Prescott, the first capital (Colton, Op. cit.). Drought years and increasing white pressure from the east were cause for unrest among the non-Pueblo tribes, and depredations increased in Arizona and New Mexico. Repeated threats from the United States government sent some of the Navaho scattering westward into new areas in the first years of the 1860's; when - in 1863 - Kit Carson was sent to pursue and take them prisoner unless they should capitulate and go to Ft. Sumner for incarceration, they spread even more widely. They sought hiding places in the territory of Utes, Havasupai, Apache, and Hopi. They had begun to filter into the Hopi area in the 1700's, but not until after the creation of their reservation in its present

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area (approximately) were they and the Hopi living almost side by side. (See Ellis: Navaho Land Claim Paper).

In Carson's report for Dec. 8, 1863, he says that when he arrived at the "Moqui" villages on the 21st, he found the inhabitants "had a misunderstanding with the Navajos, owing to some injustice perpetrated by the latter." He took advantage of this to persuade some of the Hopis to go on the warpath with him against the Navaho. He goes on to say of the Hopi:

> . . . I would respectfully represent that these people, numbering some four thousand souls, are in a most deplorable condition, for the fact that the country for several miles around their village is quite barren, and is entirely destitute of vegetation. They have no water for the purpose of irrigation, and their only dependence for subsistence is on the little corn they raise when the waather is propitious, which is not always the case in this latitude. (Cheetham, F. T., Kit Carson, Path-breaker, Patriot, and Humanitarian, N.M. Hist. Rev., Vol. 1, No. 4, 1926, p. 390).

Carson had struck a year of drought. Because of the drought, the trouble with the Hopi, and their expectation of Carson's entry with troops, the Navaho had fled in all directions.

The first traders and Protestant missionaries arrived at Keams Canyon in 1870 and a mission school was established there in 1875. (Thompson, 1944, p. 28; Parsons, E. C., Pueblo Indian Religion, 1939, p. 862). A Special Agent was appointed for the tribe in 1870, and the "Moqio" Reservation of 3,920 square miles was established by Executive Order in 1882. In 1882, after several important leading men from First and Second Mesas had formally requested a school, one was opened at Keams Canyon in 1887. The people of First Mesa, (population 544)

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especially Hano, were pleased to have the school, but most of the other pueblos were indifferent or even hostile. Oraibi, with the largest population, estimated at 1200, refused to send its children away from home for school. Compulsory quotas of school children to be filled by each village then were established. Oraibi declared they wanted none of this, nor of the census then being attempted. The Indian Allotment Act of 1887 provided for the subdivision of Hopi lands in severalty, and in 1891 surveyors were sent to the reservation. This was not at all in accord with Hopi desires. The people of First Mesa sent representatives to Washington to request that the government respect the ancient type of land ownership by clans, but the Oraibis pulled up the surveyors' stakes and threatened to destroy the school. A peak was reached:

> When a small party of officials and soldiers arrived under orders to arrest the chiefs, the Oraibians made a formal declaration of war, and order was not restored until two companies of cavalry, threatening the pueblo with guns, took five of the village chiefs to Fort Wingate as prisoners (1891). (Thompson, Op. cit., p. 29).

A white trader established himself at Coyote Springs, some distance from First Mesa about this time. Two families moved from the top of First Mesa to make the first settlement at Polacca. In 1893 a Mennonite Mission was established at Oraibi, and a rival Baptist Mission came into Polacca the next year. Government day schools were built within walking distance of all the pueblos. Oraibi and Polacca had schools in 1894 and Toreva in 1897. Traders arrived and some of the Hopi began to establish modern settlements below the mesas, near the trading posts and schools. (Thompson, Op. cit., p. 29).

The thirteen important Hopi villages of today represent the remnants of a people whose pueblos formerly were more numerous and widespread. All but one of the modern villages lie either on the three Hopi mesas or at their feet; the thirteenth, Moencopi, was settled in the 1400's and again in the 1870's by a group from Oraibi who went west of the present Hopi reservation to take advantage of the permanent water in Moenkopi Canyon. Oraibi, on the Third Mesa, has been occupied continuously at least since 1100 A.D., as indicated by sherds in the village dumps. Except for New Oraibi, at the foot of the mesa, Hotevilla (1906), now the largest and most old-fashioned of the Hopi villages, and Bacobi (1907), all of the other major villages, Shungopovi, Mishongnovi, and Shipolovi on Second Mesa, and Walpi, Shishomovi, and Hano or Tewa village (also known as Hopi-Tesa) on First Mesa, were built in their present locations on the mesa tops after 1680 by groups which previously had lived elsewhere in less protected spots. These groups all were Hopi, speaking Shoshonean, except for the Hopi-Tewa whose ancestors came to join the tribe by invitation shortly after the Pueblo Rebellion of 1680. Their language, Tewa, is not related to that of the Hopi, although they have been part of the Hopi tribe for over two centuries. Polacca grew up at the foot of the First Mesa, as already stated, in the latter part of the 19th century. Toreva is not properly a Hopi village but the site of a mission and a school.

For something over one hundred years, the Hopi have been voicing formal complaints to officials of the United States government regarding their too-near neighbors, the Navahos, beginning October 6, 1850,

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when a delegation of Hopis came to Santa Fe to talk to Mr. Calhoun. (Donaldson, 1893, p. 25.) Being "hard pressed" by the Spaniards, the Navaho had "settled near the Moqui towns", says Bancroft, and periodically renewed hostilities (Op. cit., p. 24). The raids and encroachment of Navahos on the Land of the Hopi, eventually resulting in considerable land loss, seems to have begun in the 1700's and continued. This situation has been covered in various historical sources; Thompson briefly summarizes it thus:

> As the power of Spain over New Mexico waned, the Hopi were more and more troubled by predatory Navaho Indians who plundered their fields, stole their livestock, and took their women and children. Coming from the north, the Navaho were comparatively recent migrants to the Southwest. The earliest known Navaho archaeological site in the region (located at Governador, New Mexico) dates no further back than 1540, and the earliest historical reference to these Indians appears in 1626. (Ref. given here is Kluckhohn and Leighton, 1946, p. 4). Their acquisition of the horse in historic times, however, greatly increased their mobility. After 1823, when Mexican rule replaced Spanish rule in the Southwest, Navaho raiders, no longer held in check by Spanish soldiers, increased their activities, but while they harrassed the Hopi they also unwittingly protected the tribe for another half-century from further White encroachment. Navaho raids did not cease until after the tribe had been conquered by American troops under Kit Carson in 1864, the Southwest having meanwhile become a part of the United States as a result of the Mexican War.
>
> But Navaho herders continued to disturb the Hopi, gradually encircling them, preempting most of the Hopi range and crowding the Hopi into a very small area in the immediate vicinity of their mesa villages. Persistent and increasing pressure of the rapidly expanding, aggressive Navaho on the sedentary Hopi, who since time immemorial had claimed all the land surrounding their mesas, is one of the key factors precipitating the present crisis. The establishment of a 3920-square-mile reservation by Executive Order in 1882 for the Hopi and other Indians whom the Interior Secretary should 'see fit to settle thereon' had no appreciable effect on Navaho encroachment and the Navaho-Hopi land dispute was not legally settled until 1943, when the Navaho were confirmed in the use of three-

> quarters of the original Hopi reservation which they had usurped and were occupying, leaving the Hopi the use of only 986 square miles of desert and semi-desert land. This decision, together with the stock-reduction program which immediately followed it, was probably the greatest blow which the Hopi economy has experienced in recent years. To compensate for their loss, the Hopi have been granted the use of a substantial tract of irrigated fertile land on the Colorado River reservation in southwestern Arizona. (Thompson, 1950, p. 34).

The matter of Hopi vs. Navaho lands is puzzling to the uninitiated; one customarily thinks of each Indian tribe having been accorded a reservation with traceable boundaries and use-rights restricted to one designated tribe. This is what the Hopi thought they had; the Navaho saw things differently. Volney Jones' brief paper ("The Establishment of the Hopi Reservation and some Later Developments Concerning Hopi Lands", Plateau: 23:2:17, 1950) setting forth the unusual sequence of events is of great aid in understanding the problems of this western Pueblo group:

The Hopi were one of the last tribes to receive a reservation. They had come under jurisdiction of the United States with the territory acquired from Mexico by the Treaty of Guadalupe Hidalgo, but they were 250 miles from the new offices established in Santa Fe for administration of the Indians of this new area. Not until after subjugation of the Navahos in that intervening territory was it practical for the government to do more than cast an occasional thought in their direction. When the Navaho were resettled, after the Ft. Sumner incarceration, the Hopi were inspected and an agent was assigned them in 1869.

Rodger Jones, Assistant Inspector General of the United States Army described the Hopi economy briefly as of that same year, emphasizing the problem of Hopi livestock and Navaho marauders:

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> They subsist by the chase, the culture of fruits, such as peaches and apricots, and cultivate the soil sufficiently to supply their own wants. They also make blankets, inferior, however, to those made by the Navajos in fineness and closeness of texture. At certain seasons of the year they range as far south as Prescott and in a southeasterly direction to Zuni, on the borders of New Mexico, but these expeditions are mostly for the purpose of trading. . . . Although they have been for years plundered by the Navahos and occasionally by the Apaches, who, however, rarely venture so far north, they still own a number of horses and cattle and extensive herds of sheep. They are not a warlike race, but claim they can defend themselves from attack and punish the aggressors. Their proximity to the powerful tribe of Navajos compels them to keep at home for the protection of their families and property. They possess a few muzzle-loading guns, and procure their ammunition at Zuni. They are at peace with the whites, and, it is believed with all other tribes except the Navajos and Apaches. (Donaldson, 1893, p. 35).

For the first five years agents were stationed at Fort Defiance or Fort Wingate, the one approximately 66 and the other 125 miles distant from the Hopi Mesas by wagon road. In 1874 an agency and school were established at Keams Canyon, but between 1869 and 1882 this agency was discontinued and re-established three times. The very virtues of these Indians worked to their disadvantage. Jones explains:

> The Hopi were peaceful, sedentary, self supporting, and comparatively moral. Further, they had little the white man coveted. Consequently, they received less attention and fewer favors than their more notorious neighbors, the Navajo and Apache who were, in effect, bribed time and again. The Hopi were allowed to shift for themselves on undelimited lands as long as all was going reasonably well. Eventually, however, certain developments began to indicate the need for a reservation. (Op. cit., p. 20.)

In 1876 the Hopi agent, W. B. Truax, urged that a reservation be established for protection of Indian lands. The same was urged by a new agent during the following year. There is reason to believe that the military and the Indian administration both feared that the Mormons, who

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had been visiting and proselyting among the Hopi since 1858, and about 1875 had established a community at Moenkopi (and other Mormon settlements were established on the Little Colorado river) might furnish the Indians with arms and incite them against the U.S. troops. The new Santa Fe railroad crossed south of the Hopi villages in 1882, towns (Winslow, Holbrook, etc.) sprang up, and land was in demand, probably a second cause for suggestion that a reservation be established. A third point was pressure of the Navaho on Hopi grazing lands and water supply.

> The Navajo were increasing in numbers and spilling over onto whatever lands seemed inviting. Agent Truax expressed concern over this in his report of 1876, and presented this as a reason for establishing a reservation for the Hopi. Apparently it was thought that the delimiting of a reservation might assist in controlling this problem. (Op. cit, p. 21).

Unfortunately the boundaries of the new reservation were marked only on maps in Washington and not on the ground until about ten years later. As Jones comments, "Their location could hardly have been known to the Indians or to nearby whites, or even to the representatives of the Office of Indian Affairs" (Ibid) and if they had been known, there was no one to enforce their use, for the Hopi agency had been discontinued again in the fall of 1882. For the next five years the Hopi were theoretically under jurisdiction of the Navaho agents at Fort Defiance but these men were fully occupied with their primary charges, the Navaho.

The Hopi reservation as laid out in 1882 was a rectangle drawn without consideration of topography and within these artificial boundaries the entire northern half (north of the 36th parallel) and much of the

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periphery of the southern half already was occupied by Navaho. At Moenkopi, to the west, the location of large springs and the only perennial stream in the area used by the Hopi, the village of Oraibi had maintained an agricultural community for generations. Here most of the Hopi cotton and wheat, plus other produce, was grown, but the Moenkopi area was not included in the Hopi reservation at all.

At the time the Hopi reservation was established, it met the Navaho reservation to the east; the Navahos who were locating in a ring around the Hopi reservation were off their own designated territory, which appears to have been too small to accomodate all of their people, including those formerly living north of Mt. Taylor, in the Chaco, etc., areas not included in the Navaho reservation. The Navaho reservation subsequently was enlarged by successive executive orders and completely enclosed the Hopi reservation. Even Moenkopi was given to the Navaho in an extension of their reservation in 1900. The Hopi continued to hold onto a portion of this small but old agricultural center of their people and "the Navaho continued to live on the Hopi reservation and moved onto it in ever larger numbers." Navaho population and Navaho flocks were increasing, the epicycle of erosion was progressing, and, aggravated by overgrazing, was ruining ever-increasing areas from the standpoint of forage and agricultural use, both. Both tribes were losing but the Hopi were at a serious disadvantage in comparison to the more numerous and more aggressive Navaho. The Office of Indian Affairs and its agents (Hopi finally received a superintendent of its own in 1933) tried "only to prevent too close compression of the Hopi". The Hopi at Moenkopi were administered by the Western Navaho Agency at Tuba City, and the Navaho on the Hopi reservation by the Hopi agency at Keams Canyon.

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The outcome of pressure on Navaho from the east, the Navaho population burst, the encouragement toward increase of Navaho flocks, and the failure to protect Hopi lands from their incursions in spite of long-repeated complaints from the Hopi in regard to sacred areas of shrines, eagle nests, turtles, etc., as well as farming, herding and hunting areas, was setting up a land management district around the Hopi villages in 1937. This unit, Number 6, commonly referred to as the Hopi Unit, is fenced. The Hopi must graze their stock and plant their fields inside this district; the remainder of their former lands has been turned over to the Navaho and is under jurisdiction of their agency at Window Rock. "In partial return" the Hopi use and occupation of a portion of the Moencopi area is officially recognized and, with their "Land Use Unit", is administered from the Hopi agency in Keams Canyon. Jones makes a compact statement of the resulting situation:

> The land use unit and part of Moencopi are administered as if they were the Hopi reservation. This area is often referred to as the "Hopi Jurisdiction", but on at least one map issued by the office of Indian Affairs, the land management unit is actually labeled the "Hopi Indian Reservation" and the original outlines of the Hopi Indian Reservation are not even indicated. [Reference is here made to U.S. Office of Indian Affairs map of the "Navaho Country", 1937, revised 1945.]
>
> The boundaries of the Hopi reservation as established in 1882 have never been revised by any executive or legislative action. It would thus appear that the Hopi still retain rights over the entire reservation. Actually through Navajo trespass and administration practice, they are now confined to a fraction of their lands. The original reservation has been ignored in the new administrative organization. The expediency of this, in view of the serious need for additional Navajo land, is readily understandable, but the legality of this situation is perhaps open to question.
>
> The lands reserved for the Hopi, although originally generous in quantity, are mostly of marginal character and incapable of supporting intensive and highly productive

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> The lands reserved for the Hopi, although originally generous in quantity, are mostly of marginal character and incapable of supporting intensive and highly productive

> agriculture or stock raising. By judicious use of their land and by ingenious techniques of dry-farming, the Hopi have managed to scratch a precarious living from this unpromising area. They have been traditionally a sedentary people, tilling the soil near their villages. In later times, their crops have been supplemented by limited stock grazing. Their operations were chiefly near their villages, so it is not likely that they would have made much use of the more outlying parts of their reservation, even had these been available to them. But as the Navaho appropriated land close to the villages and reduced the grazing range, Hopi economy was affected adversely.
>
> The present confinement of the Hopi certainly precludes any real expansion of their activities to increase productivity. Officials have even required them to reduce their stock to conform to the diminished lands allowed them. Even with the improvements introduced by the government, it is apparent that the lands now controlled by the Hopi will not be adequate to permit more than a bare subsistence economy. This is recognized in the recent bill appropriating $88,570,000 to be applied over a ten year period "to promote the rehabilitation of the Navajo and Hopi Tribes, by carrying out the program outlined by the Department of the Interior [Krug, 1948]. If the Hopi, along with the Navajo, are to "attain standards of living comparable with those enjoyed by other citizens" as visualized in the bill, then a review of Hopi land holdings would seem to be in order. (Jones, 1950, pp. 23, 24.)

In one of his footnotes to the above (fn. 31, p. 24), Jones points out that although the U. S. Soil Conservation Service Report for 1937 (p. 30) lists the annual per capita income of the Hopi as $163.56 the figures given by Thompson and Joseph (1944, pp. 24, 31) for total income ($279,800: 1942) and population (3558: 1943) suggest a figure of less than half that sum. In 1950 the Hopi jurisdiction consisted of 631,194 semi-desert acres, of which 7130 were cropland, used for dry and arroyo farming. By 1944, 110 acres had been brought under modern irrigation. In addition to the above, the Moencopi area provided the Hopi with 274 acres. As the total estimated irrigable area of the jurisdiction is less than 400 acres, it became obvious that the 4000 Hopi (1950) must still depend on arroyo flood and dry farming to a considerable

extent even if irrigation facilities became available. (Thompson, 1950, pp. 42, 43.) The Hopi (and the Navaho) have been offered an irrigated tract for settlement on the Colorado River. (Op. cit., 1950, p. 42.) The latter is a portion of the Mojave Reservation, opened for use of Japanese in the resettlement program of the Second World War, and apparently not needed by the Mojave for agriculture as of today. The problem with trying to persuade the land-needy Hopi to move here is that one of the old Hopi rules is that inhabitants of a "clan block" of houses must obtain permission from the clan leader to move from that block. Such a move is against Hopi precepts because the clan leader keeps in her house ceremonial items believed to protect the clan members, and it is absolutely requisite that ceremonies involving such material be carried out to ensure the welfare of the clan, the community, and the world. Although such ceremonies, which must come in their prescribed season and order, are the duty of a religious society composed of persons of various clans, the head of the society is head of the clan. Clan heads obviously could not leave the mesas. But as every worth while Hopi is expected by his clan and community to be a functioning member of one or more of the religious societies, and as he knows himself to be remiss in his public duties - and gravely criticized - if he does not function as such, a move from his home community is almost impossible unless he gives up the religion of his people. (Parsons, 1933, pp. 36, 37). No conservative Hopi, obviously, can do this. Moreover, he gives up the social life which means so much to village-dwellers and which is elaborately expressed in their ceremonial, as well as daily, life. Finally, he must give up his membership in the Hopi tribe if he moves to the Colorado area; by his third year in the new area he must become a member of the

"Colorado River Indian Tribes". This loss of citizenship is a hard point to face, as most Hopi are intensely loyal to their group, even if inside squabbles periodically have disrupted the surface. Consequently, with all of these problems to surmount, the Hopi movement to the Colorado has been very small. Better to survive in economic poverty but richness of social participation at home than to be more affluent but an alien in a foreign area, reason the majority of the Hopis in the hard decision forced upon them. (Barnett, 1948, pp. 8, 9, 12). The result is that almost no Hopi but those who have become Christians and who in most cases do not get along well with the home village, have moved to the Parker or Colorado River Reservation area.

A breakdown of tribal income for the year 1942 (regarded as normal) is given by Thompson to illustrate the economic importance of land base and natural resources to the Hopi. Of the total income, 22 per cent came from farming, 34 per cent from grazing, and 36 per cent from wages, largely in government jobs. Unearned income and native products provided about 1 per cent each, private business 4 per cent, and arts and crafts 2 per cent. The mean income per family (1942) was $439.82, though more than half the Hopi families earned less than $300 per year and only five families $2,000 or over. Of this only 1.4 per cent was derived from government allotments and relief, which is pointed out as an extremely low percentage compared to the all-reservation average. (Thompson, 1950, pp. 39, 40).

Oraibi is worse off economically than the other Hopi villages because it has a smaller land base in relation to size of population than that of the others. This is because Oraibi (1) failed to obtain a sizeable

share in the redistribution of land after the destruction of Awatovi, (2) suffered a "relatively serious loss of lands because of Navaho encroachment", and (3) the land they had became more critically eroded and hence required a much more drastic stock-reduction program than that faced by the other mesas. (Thompson, 1950, p. 46). The approved carrying capacity of the range was reduced from a total of 31,189 sheep units in 1942 to 23,627 in 1943, which necessitated selling about 24 per cent of the total Hopi livestock. This reduced stock was distributed thus:

Stock	Sheep Units
1,000 cattle	4,000
1,200 horses	6,000
1,000 goats	1,000
12,627 sheep	12,627
Total	23,627

> Because of the unequal distribution of stock on the range in relation to range capacity, the program called for an average reduction of about 20 per cent of the stock of each owner on First Mesa, 22 per cent on Second Mesa, and 44 per cent on Third Mesa. Thus again Third Mesa was hardest hit, indeed over twice as hard as First Mesa. Whereas the First and Second Mesa groups accepted the program and appointed local committees to carry it out, the Third Mesa stockmen, incited by off-reservation cattle interests, created some disturbance. When economic pressures from outside were reduced, however, the Third Mesa group was persuaded to accept reduction.
>
> Adjustment of livestock to range carrying capacity should start a rehabilitation of the range which may be expected to respond more rapidly in First and Second Mesa areas than in the more critically eroded Third Mesa area. But the drastic reduction has engendered a good deal of bitterness, especially among Third Mesa leaders. As one of the Oraibians angrily exclaimed in a meeting with the Indian Commissioner, "Tell me, how can I raise five children on nine cows?" The program was resented both because of immediate losses in economic assets and because, by limiting the number of stock permitted any one owner, it put a lid on the new trend toward upward mobility through individual ownership of livestock and prevented a concentration of individually owned wealth, in the form of stock, in the hands of a few relatively prosperous owners.

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> . . . Besides the stock-reduction program, attempts have been made by the Indian Service to foster sound stock management. These attempts include branding, sheep dipping, breed development . . . , ram segregation, fodder raising, corral construction, improvement of stock water supply, and the organization of stock cooperatives. (Thompson, 1950, pp. 38, 39, 41).

Thompson concludes:

> . . . Whereas the land base of many Indian tribes has been increased under the new administration (after 1933), that of the Hopi has not been increased, but actually has been decreased. The Navaho, some of whom were already living within the boundaries of the original "Moqui" Reservation when it was set up in 1882, gradually encircled the Hopi and took over more and more of the range, until by 1910 they were using practically all of the Reservation land except a small area in the vicinity of the Hopi mesas. Unfortunately this movement coincided with the period of erosion, which has progressively reduced the Hopi land base to a fraction of its former value and made imperative the drastic stock reduction program. Moreover, the Hopi considered that the original "Moqui" Reservation was set up for their exclusive use (although actually it was "for the use and occupancy of the Moqui and such other Indians as the Secretary of the Interior may see fit to settle thereon") and that even this arrangement was an outrage to their vast traditional land claims. Consequently disputes arose between the Hopi and the Navaho, which were finally settled legally by the Government's setting of a grazing unit of 624,064 acres of grazing land for the exclusive use of the Hopi (1943). (See pp. 18-19). The result has been to confine the Hopi within an area about one-fourth the size of the original Reservation, a circumstance which, added to past events, has increased the sense of grievance which many Hopi feel toward both the Navaho tribes and the Government. (Thompson, 1944, p. 32 and maps pp. 18, 19).

Census figures for the tribe (see listing at end of chapter) are unreliable until the last decade or two, except for indicating that population apparently lost ground or remained practically stationary from 1890 until about 1920. It then began to increase, rising about 12% between 1920 and 1932, and 25% between 1933 and 1943. This gives an annual increase of 2.5% through the 10 years. The population density per square mile in the Hopi jurisdiction in 1943 was 3.04, as compared to 1.81 in the original "Moqui" Reservation, 1.42

in the surrounding Navaho Reservation, and 1.00 in adjacent rural areas. (Thompson, Op. cit., p. 30). The Hopi population in 1950 was about 4000. (Ibid, p. 37).

Colton's short descriptions (Colton, H.S., and Baxter, Days in the Painted Desert and San Francisco Mountains, Mus. Northern Ariz. Bull. 2, 1932) of the various villages and written in 1932, provides a convenient introduction to the individual villages and our examination of the Hopi in their native habitat:

> Walpi: Population 163. Present pueblo built about 1700, is the best known and most picturesque of the Hopi pueblos. We do not know when man first lived about First Mesa, but we do know that shortly after the beginning of the Christian Era he dug pit houses about the rocky base of Walpi. Shortly after 1300 A.D., Hopis built a pueblo called Walpi on a terrace west of the present Walpi, at a place now called Ku-chap-tu-vela, "Gray Slope". The word, Walpi, is a contraction of two Hopi words, Wala, a gap, a cleft; and ovi, a place. The letters "v" and "p" and "b" are interchangeable in Hopi. Walpi means "The Place of the Gap." No documentary evidence exists that Coronado's party visited Walpi. The first recorded visit of Spaniards was in 1583, by Espejo. In 1629, when Franciscan missions were established in the Hopi country, Walpi was not considered important enough to receive one. However, a chapel was built on the terrace on the end of the point. During the next fifty years families moved from Ku-chap-tu-vela and built their homes around the chapel. They took the name Walpi with them. After the Pueblo Revolt in 1680, the Walpians moved to the mesa top, fearing retribution from the Spaniards. After that the old site became known as Kisak-ovi, or "The Ladder House." (Op. cit. p. 41.)
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> Sichomovi: "Place of the Mound where the Wild Currant Bushes Grow". Population, 315. It is the central village located between Walpi on the south and Hano on the north, which it adjoins. It is a colony of Walpi, the people having moved there from the older pueblo in the middle of the eighteenth century.
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>
> Hano: Population, 309. Hano was established in the early part of the eighteenth century by a part of Rio Grande pueblo people who . . . fled from the . . . Spaniards . . . . If a group of

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people wish to join a Hopi pueblo, it is customary to require them to prove themselves useful and worthy citizens before they are allowed to settle permanently in the neighborhood. Some service is required of them. The service that was required of the Tewa people was that they guard the trail. (Op. cit., pp. 40, 41.)

Polacca: Population 787. . . . This village grew up about the First Mesa Day School in the last decade of the nineteenth century. The village has no political entity. Each inhabitant owed allegiance to one of the three pueblos on the mesa top. . . Near the day school on the mesa side of the road lies the old Walpi Spring - a green pool walled about. This spring is now used for watering stock and plays a part in certain ceremonies.

Between the day school and the trading store, on the side of the road next to the mesa, is another spring from which the people carry their drinking water to the towns on the mesa top..

Two miles north of Polacca lie the extensive ruins of the Hopi pueblo of Sikyatki, the Yellow House. These ruins cover ten to fifteen acres. The pueblo was founded in the fourteenth century and was destroyed, so tradition says, by Walpians in the sixteenth. It seems to have been occupied in 1540 (Winship, Coronado Exped.), but was not mentioned in 1583. (Luxan, Diego P., Exped. into New Mex. made by Antonio de Espejo, 1582-83, Hammond and Rey, Quivira Soc., Vol. 1, 1929). The auto road to the top of First Mesa ... at one mile ... passes 'The Gap', which gives Walpi its name (Hopi Shrine) ... (Colton, 1932, p. 39)

Second Mesa

Shung-opovi: Population, 307. The most important of the Second mesa pueblos. The name, Sung-opovi, is derived from three Hopi words: sung-o-hu, a tall, jointed reed; pa, a spring; and ovi, place of. Therefore, the name means "The place by the Spring where the Tall Reeds Grow." Shungopovi has been spelled 57 different ways, and the spelling "Chimopovi" approved by the Indian Bureau has no justification either by pronunciation or etymology.

By tradition, Shung-opovi is the oldest Hopi pueblo. It was settled by a group led by a member of the Bear clan and ever since then the hereditary chief has been of that family. The second most important clan in Shung-opovi is the Cloud clan.

Hargrave gives us the following account:

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"Tradition says that there was only one spring at Shung-opovi many years ago, and the spring was owned by the chief of the village. One day the Cloud Clan came to Shung-opovi and petitioned to join the pueblo. Before their petition was answered they were required to demonstrate that they would be an asset to the pueblo. To prove their worth, a short distance from the spring 'Shungopa' the Cloud Clan planted a small olla of water as a 'spring seed'. Their efforts were successful and the spring grew and filled with water. 'Masipa' or 'Gray Spring' is its name.

"Gray Spring is walled with stones and for centuries was the main water supply for the village. It is in use today. The old spring, 'Shungopa' failed about 1870 when the slumping of the ledge above produced a local earthquake.

"For several centuries the pueblo was located about 200 yards north of the walled spring. It is estimated from the area covered by the ruin that the pueblo had a population of several hundred persons. From a study of sherds collected from middens in this section (A on the map) the author has determined that the pueblo was constructed before 1250 A.D. and was occu ed until the early part of the 15th century when the population moved down by the spring where the natives were living when the Spaniards arrived (B on map).

"November 15, 1598, is an important date in Hopi history, for Juan de Onate with several companions took possession of the Hopi country and made the Indians swear obedience and vassalage to the King of Spain. With Onate was Fray Juan de Claros to whom was assigned the Christianizing of the natives. The visit of Fray Juan de Claros was the beginning of actual subjugation of the Hopi, and in August of 1629, Francisco de Porras, Andres Gutierrez, Cristobal de la Concepcion, and Francisco de San Dienaventura began the construction of the mission of San Bernardino at Awatobi. Later, missions were established at Shungopovi, Mishongnovi, Walpi, and Oraibi. The mission at Shung-opovi was built on the level top of a ridge at a point about 500 yards above the spring. Very little of the mission building is now standing, but the north end and west side are still visible. Of the original masonry of the mission building, the north end and northern part of the west wall are incorporated in a stone corral. All other walls have been destroyed. Accurate measurements of the mission cannot be taken, but a close estimate from remaining outline shows the nave to be about 44 x 18 feet, and the apse about 10 x 10 feet, inside measurements . . . . In 1680, the inhabitants of Shung-opovi joined in the Pueblo Rebellion, killed the padres and destroyed the mission . . .

"During the period between 1629 and 1680, Shung-opovi was clustered around the mission. Evidence of this period is found in the middens associated with the surrounding ruins, in which are found pieces of Spanish Majolica ware and many pieces of Hopi pottery showing definite Spanish influence.

"After the destruction of the mission, the people of Shung-opovi moved to the top of the mesa. Evidence of this change is not only

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supported by tradition but by the presence of beams of the Mission Period which are in use today in houses of the new village. Further support is also given by examination of the middens which reveal no sherds earlier than the Mission Period. The cause for this change is clearly the fear of the inhabitants of Spanish retribution." (Hargrave's map, fig. 6, is marked "A and B, Shung-opovi before 1630. C, Shung-opovi from 1630 to 1680. After 1680 the town moved to its present site on the mesa top.") (Hargrave, Lyndon L., Shung-opovi, Mus. Notes, Vol. 2, No. 10, 1930).

Shipaulovi: Population 123. "The Mosquitos" occupy a picturesque site on the top of a small hill. The name refers to a tradition that the village was founded by people from Homolovi, a ruin near Winslow ... who were driven from the Little Colorado site by hordes of mosquitos.

The presence of mission beams in Shipaulovi gives support to the theory that Shipaulovi was settled by people from old Shung-opovi. When the latter pueblo was abandoned about 1700, some of the inhabitants founded New Shung-opovi on the mesa top and some went to Shipaulovi. [The Hopi explain that Shipaulovi was founded as a safeguard for ritual traditions should the Spaniards destroy Shungopovi. (Thompson, Chap. 2, Footnote 5, Op. cit.)]

Mishongnovi: Population 266. "Place of Black Man." The name refers to a chief, Mishong, a member of the Crow Clan who led his people from the San Francisco Mountains. Applying for permission to settle at Shung-opovi, they were refused because they had performed no service for the people of Shung-opovi. Finally, permission was given them to settle by the Corn Rock on condition that they protect the shrine from the people of Walpi.

The original site was, therefore, below the point of the mesa about the Corn Rock, that prominent landmark of the Second Mesa. The site was settled certainly from the thirteenth century to the beginning of the eighteenth when the people moved to the present site on the mesa top. From 1629-1680, the Franciscans maintained there a chapel called San Buenaventura, visited by a priest from Shung-opovi.

The present pueblo dates, therefore, from about 1700.

.... When one stands on the mesa top and looks into the valley below, one sees, to the south, a volcanic rock, called by the whites, "The Giant's Chair". About this old volcanic vent some ancestors of the Hopi built a pueblo called Ho-ya-pi, which was occupied in the thirteenth century. It is now in ruins.

At the base of the mesa to the southwest is the Toreva Spring. Here is located a day school.

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Third Mesa

Oraibi: Population 87. The name "Oraibi" means the place of a particular rock called "Orai". A pueblo partially in ruins, Oraibi contests with the pueblo of Acoma in New Mexico the honor of being the oldest continuously occupied town or city in the United States. The site we know from archaeological evidence to have been occupied from at least 1150 A.D. to the present time.

By tradition Oraibi was settled by a split from Shung-opovi. It is said that the chief of Shung-opovi quarreled with his brother who led a party to this site. Be that as it may, the chiefs of Shung-opovi and Oraibi are both members of the Bear Clan.

Oraibi was visited by Coronado's men in 1540. It was made the seat of the Mission of San Francisco de Oraibi in 1629, which was destroyed in the pueblo revolt of 1680. The site of the Mission Church can be recognized by a low mound north of the pueblo. Carved timbers from this church can be seen in a ruined Antelope Kiva in the southwestern part of the town.

Until 1906 Oraibi was the largest and most important Hopi pueblo with over 1200 inhabitants. In that year a number of the people who differed with the Oraibi chief on certain administrative measures abandoned their homes and founded Hotevilla eight miles to the northwest across the mesa. A quarter of a mile north from Oraibi, on the Hotevilla trail, can be seen a line cut in the rock and an inscription commemorates the event, "Well, it will have to be this way now, that when you pass this LINE it will be DONE, Sept. 8, 1906." On the rock is also cut a bear's paw, the clan symbol of Tewa-quap-tewa, the Oraibi chief of the Bear Clan, and a death's head, the clan symbol of the seceding leader, You-ke-oma, of the Masau-u or Skeleton Clan.

This inscription records a dramatic event. The old man, You-ke-oma, sat on the line and the followers of Tewa-quap-tewa pushed one way and his own followers pushed the other; a primitive tug-of-war. If You-ke-oma's followers had won, Tewa-quap-tewa would have been deposed. Instead, the chief won, so the defeated, with their families, left the city. It must have been a sad procession.

Near the inscription lies one of the deep cisterns cut into the rock from which the people of Oraibi procure their water. The mesa is dotted with such cisterns, each belonging to a different clan or family ...

On the east side of the mesa, a quarter of a mile north of the town, one can see grooves in the rock which the inhabitants believe were made by the oxen of the padres dragging timbers from the forest on Black Mesa to the pueblo for the mission.

The present abandoned church on the south end of the mesa was built by the Mennonites.

The prehistoric Hopi town of the 12th century lies under Oraibi. Rooms of this period are exposed under the trash heap by the side of the road entering the pueblo from the south.

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[Thompson explains the Oraibi break whith other detail: "A crisis was precipitated when a group of conservatives from Shung-opovi moved to Oraibi at the invitation of the "Hostiles" leader (1904). A severe drought followed and Tewaquaptewa, Village Chief and leader of the "Friendlies" insisted on the return of the Shungopovis in order, as he said, to ease the water situation. Since neither side would yield and open conflict was prohibited traditionally and also by the Government, in the summer of 1906 both sides agreed to settle the issue by means of a contest. The two parties faced each other on either side of a goal line just outside Oraibi, the "Friendlies" with their backs toward the pueblo, and each side pushed forward until the "Friendlies" finally triumphed by pushing over the line. The "Hostiles", thus forced out of the pueblo, founded the village of Hotevilla on the mesa eight miles northeast of Oraibi, and thereby reduced the population of the ancient pueblo to about 600. At this point the Government Agent stepped in and arrested the leaders of both sides, as well as most of the "Hostile" men. These "Hostiles" were sentenced to from three months to three years of hard labor, while Tewaquaptewa and his nephew were sent for four years to school in California. Thus depleted, the Hotevilla band suffered considerably during the following winter and this strengthened their resistance to the Government." (Thompson, 1944, p. 30.)

Except for the matter of the obviously mis-handled early school situation and the intervention of the government at the time of the break, this event probably is of a general pattern with events which split pueblos apart in the Hopi area and elsewhere many times in the past.]

Hotevilla: Population 418. It is eight miles northwest of Oraibi. The name Hotevilla, meaning "Skinned Back". "Hota" a back and "Belli", skin off or peel. It refers to the Hotevilla Spring which used to be in a low cave. One entering to get water often skinned his back. Founded in 1906 by a chief, You-ke-oma, who seceded from Oraibi. For two decades the people of Hotevilla were "thorns in the flesh" of the Indian Administration. They refused to send their children to school. On one occasion, the U.S. Cavalry was called out to round up the children who were hidden in the houses. The children were captured and sent to boarding school and not allowed to go home in the summer for several years. The Indians also refused to have their sheep dipped. For this the old chief was banished to California. All of this made much bad feeling. It seems now that all trouble could have been avoided if the Bureau of Indian Affairs had used more tact and had recognized You-ke-oma as chief. It is said by You-ke-oma's son that his father really wanted the children to go to school, but he wished, as chief, to be consulted in the matter.

Now Hotevilla is one of the most progressive pueblos....

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Bakabi: Population, 129. "Place of the Jointed Reed." Eight miles north of Oraibi and one-half mile east of Hotevilla. This pueblo was founded by a group of people who seceded from Oraibi with You-ke-oma. They became dissatisfied with the hardships of the first winter at Hotevilla and asked Tewa-quap-tewa at Oraibi to allow them to return to their old homes. The Oraibi chief refused. So this group, under Ki-wan-imp-tewa, settled in 1907, by the Bakabi Spring. Bakabi, because of its progressive chief, has more public spirit than the other pueblos, so the streets are cleaner and the houses better cared for. The gardens, about the spring, are worth a visit. Nearby is a Mennonite Mission and the Hotevilla Day school.

Kia-ko-chom-ovi: Population 355. "Place of the Hills of Ruins". Usually called Lower Oraibi. This town is composed of progressive people from Oraibi who have settled around the school, mission and trading store. It is politically independent of Oraibi. The school is said to have been founded in 1890.

Moenkopi

The present village of Moenkopi, established in the 1870's, is built on a shelf of Navaho sandstone which overlooks the irrigated fields beside the Moenkopi Wash.

"Prehistoric people of the great pueblo period (Pueblo III) built their communal dwellings on the ridges of the neighborhood. These pueblos were abandoned before 1300. In the fifteenth century, the Hopis built a pueblo near the present pueblo of Moenkopi, but it seems to have been occupied but for a short time .... Moenkopi was founded in the '70's by the Oraibi chief, Tuba, on the site of (the) earlier village which was in ruins when visited by Father Garces in 1776 ... Moenkopi is a colony of the Hopi pueblo of Oraibi, which lies about fifty-five miles away to the southeast. This means that the people of Moenkopi recognize the chief of Oraibi as their chief. This pueblo differs from the other Hopi pueblos because the people are able to irrigate their fields from the springs, while all other Hopis practice dry farming.

"During the seventeenth and eighteenth centuries Spaniards visited the region and one (Garces) reported a settlement of 50 Yavapai Indians (Mojave Apaches) cultivating gardens about the springs, while Hopis from Oraibi cultivated gardens near the ruined pueblo by the Moenkopi Wash. Permanent settlement began when James S. Brown led a party of Mormons to this place in 1875. Near the present site of the pueblo of Moenkopi they built a stone building with log additions. In 1878 Erastus Snow, one of

> the founders of Snowflake, Arizona, laid out the present townsite of Tuba City near Musha Spring, two miles north of Moenkopi. The new town was named for Tuba, chief of the Hopi pueblo of Oraibi. In 1900 the Mormon ward of Moenkopi embraced 150 persons. In ignorance the town had been built on Indian land and the Mormons were unable to procure a clear title. In 1903 the United States purchased the improvements for $45,000 and has since made Tuba City the headquarters of the Western Navaho Jurisdiction ... In the summer of 1928, C. L. Walker, Superintendant of the Western Navajo Reservation in northern Arizona, directed the development of a spring lying on the northeast outskirts of Tuba City, the agency town ... This spring has been called the Charlie Day Spring because an old blind Navajo, once a scout in the United States Army, has his hogan here. (Colton, 1932, pp. 64, 65.)

In summary, then, Moenkopi was built in the 1400's, the village abandoned before 1776 but the land still cultivated by Hopis in the 1600's and 1700's, and the pueblo reestablished in the 1870's. A small group of Yavapai were the neighbors of these Hopi at a distance of two miles (at the springs) in the earlier period, and the Mormons and at least one Navaho, also at the springs (Tuba City) in the later period.

An interesting and detailed itemized summary of Hopi-White contacts between 1540 and 1850 is given in Dockstadter, 1954, pp. 147-158. With the latter date, as he concludes .... "the last real isolation of the Hopis ended; from that date on, I have been able to establish definite records of White contacts with the Hopis for every year except 1855 and 1856 - and I am confident that ultimately these years also will be found to have seen such contact."

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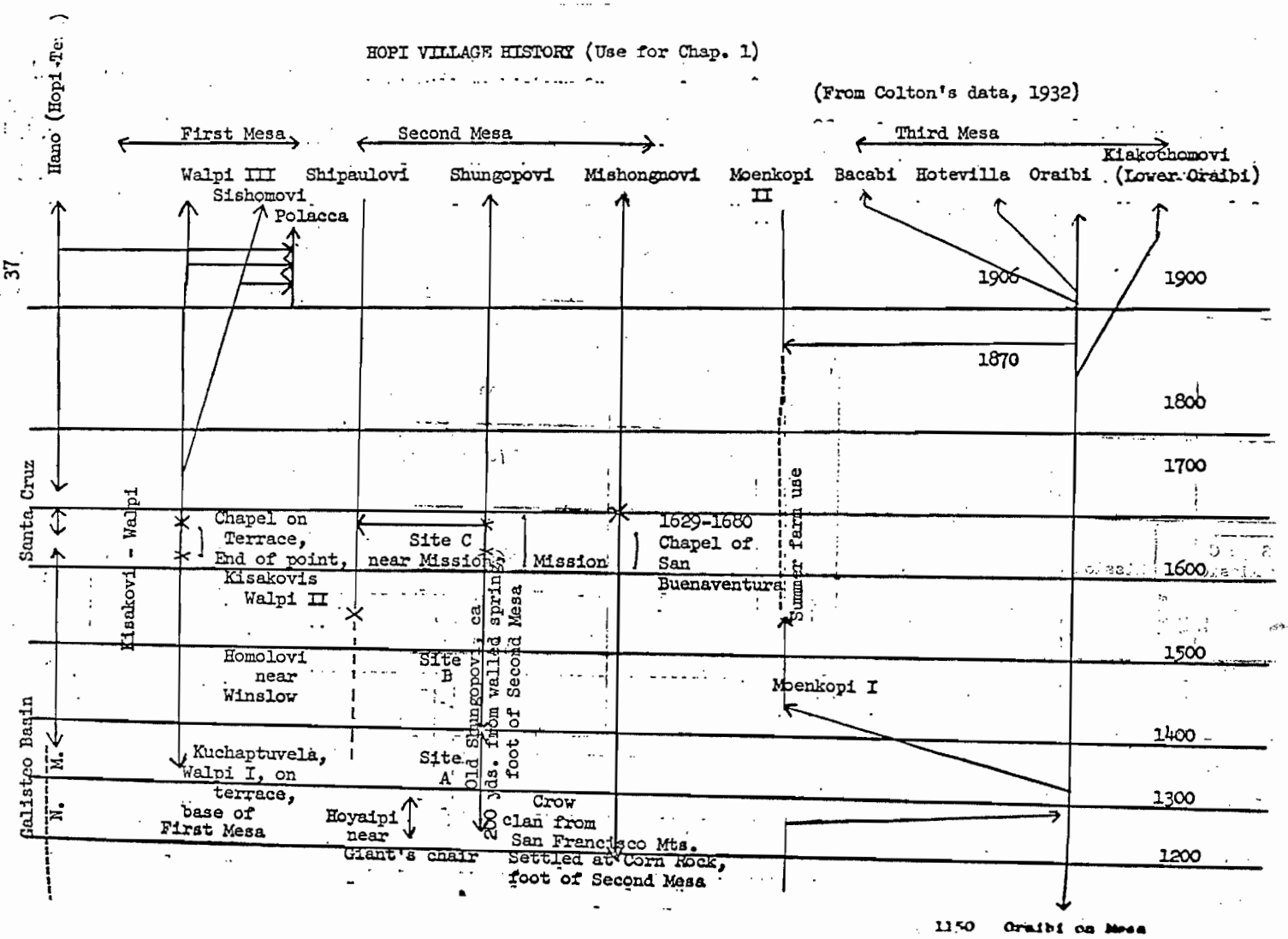

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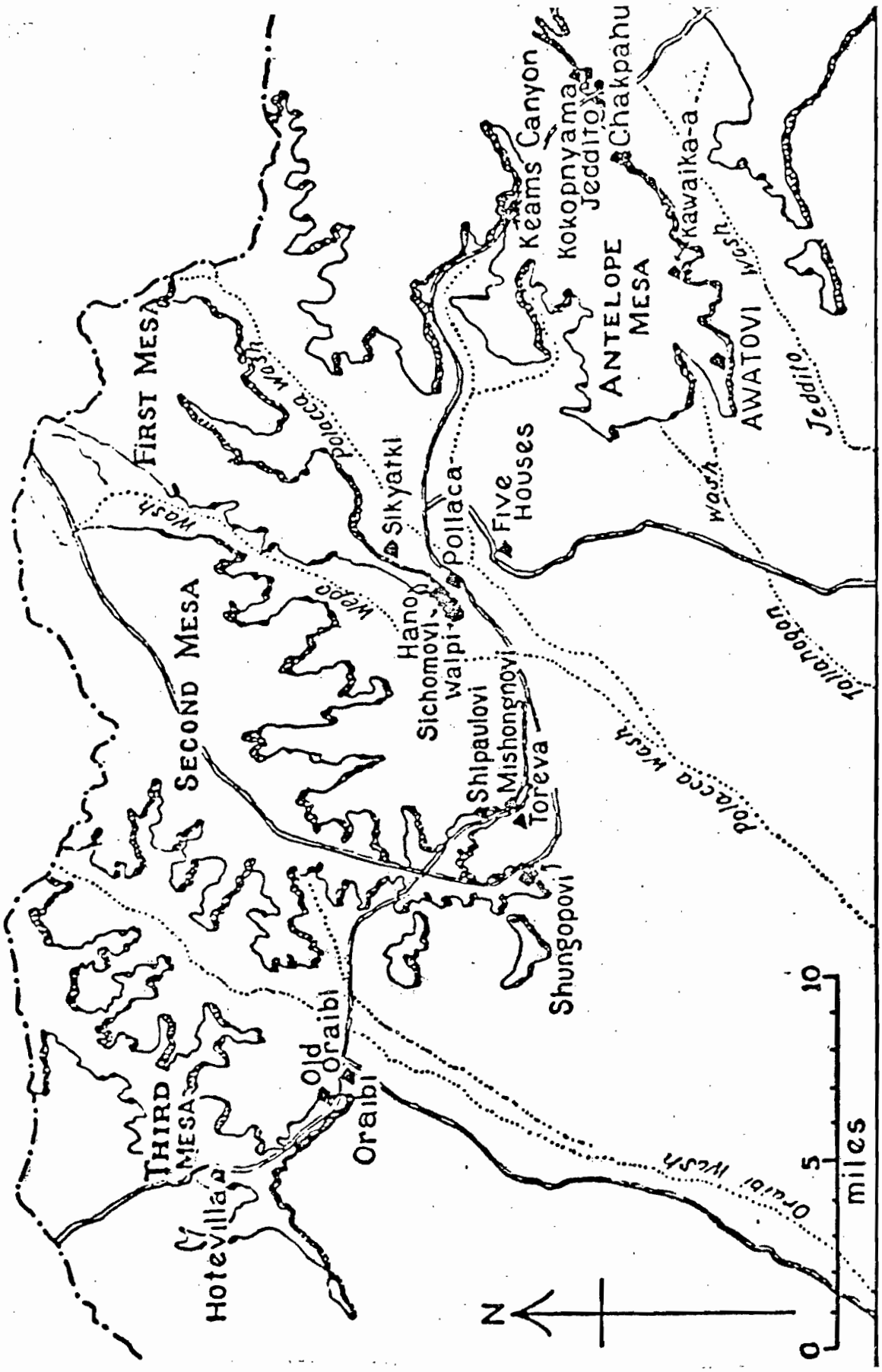

FIG. 2. THE HOPI AREA, showing the location of villages, both prehistoric and modern, together with the major physiographic features and existing roads.

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SOME APPROXIMATED STATISTICS ON THE HOPI, 1893

Population, 1583-1890 (Donaldson, 1893, p. 15)

Espejo estimates the Moquis in 1583 at 50,000. They received him cordially, he writes, giving him feasts and dances. His imagination seems to have developed with their hospitality.

In 1745 two friars claimed to have counted the persons in the Moqui pueblos, and they numbered 10,846.

In 1775 Governor Anza gave them as 7,497.

In September, 1780, Governor Anza gave the Moqui population as 798. No rain had fallen for 3 years, and in that time the Moqui deaths were given at 6,698.

Governor Charles Bent of New Mexico, November 10, 1846, gave the population of the Moquis as 350 families, or 2,450 persons.

In 1852, Surgeon P.S.G. Ten Broeck, who visited the Moquis, gave the population as 8,000.

Early in 1853 Lieutenant Whipple, United States Army, in charge of an exploring party for surveying a railroad to the Pacific, gave the population of the Moquino (Moqui) pueblos at 6,720, and follows Governor Martinez in his estimate of the population of the 19 pueblos in New Mexico. This was prior to the smallpox of 1853-1854.

In 1861 John Ward, United States Indian agent, gave the population of the Moqui pueblos at 2,500.

In 1865 Mr Ward stated the Moquis to be 3,000.

In 1869 Vincent Colyer gave their population as 4,000 (estimated, of course.)

The various agents of the Moqui Pueblos in 1864 have made estimates of their number varying from 2,000 to 4,000.

The Eleventh Census gives the 7 pueblos a population of 1,996.

Personal Wealth and Live Stock, 1893 (Donaldson, 1893, p. 46)

The value of the Moqui personal property, including live stock, is estimated at $84,900, as follows:

20,000 sheep, worth $2 each	$40,000
5,000 goats, worth $1.50 each	7,500
1,100 horses or ponies, worth $10 each	11,000
800 cattle, worth $17 per head	13,600
3,200 burros or donkeys, at $4 each	12,800
Total	$84,900

The Moquis consume annually 2,500 of their own sheep and goats, besides what they procure from the Navajos. They sell 26,000 pounds of wool a year to the traders at from 8 to 9 cents a pound and utilize the remainder in making blankets or garments. They also sell each year many blankets and baskets and some pottery and ornaments and trinkets (about $1,000 worth of ornaments and trinkets), their cash income from these sources being not less

than $10,000 per year. Money is not as essential to them as to white people, as they produce everything they eat, drink, or wear, except coffee, tea, sugar, and some spices. These they buy from the traders. They have considerable personal property in the way of silver, jewelry, turquoise, household furniture, blankets, etc. Silver is preferred to gold for jewelry or ornamentation.

The amount of cotton raised and made into cloth is not estimated, but the Moquis used to spin and weave enough cotton to make light summer clothing for their people; of late years they wear but little clothing of their own manufacture, as they can buy cloth cheaper of the traders than they can raise the cotton.

The Annual Food Supply of the Moqui Pueblos (Op. cit., pp. 46-47)

The Moqui pueblos (a) contain 1,996 people; to properly feed and clothe so many people requires thrift and labor, especially when the barren country in which they live is taken into consideration. In 1890 and 1891 the corn crops were as follows:

First mesa	1,000 acres
Second mesa	1,000
Third mesa (Oraibi)	1,600
Total	3,600

The yield per acre is about 12 bushels, and there are about 56 pounds to the bushel, so that in the 3,600 acres there would be --

Bushels	43,200
Pounds	2,419,200

Home consumption	919,200 pounds
Bartered to Navajos for sheep, goats, etc.	650,000
Sales to traders	150,000
Surplus stored	700,000
Total	2,419,200

The above, of course, is an estimate made from information gathered at the trading posts and a general observation of the land under cultivation.

The peach orchards and vegetable gardens yield ample fruit and small vegetables and melons. The onion garden at Weepo, used in common, is of great service to the people. There are about 2,000 acres planted in vegetables between the 7 villages that are tilled by the Moquis collectively, distributed thus:

First mesa	500
Second mesa	500
Third mesa (Oraibi)	1,000
Total	2,000

There are fully 1,000 acres in peach trees, distributed as follows:

First mesa	300
Second mesa	200
Third mesa (Oraibi)	500
Total	1,000

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The peach orchards are located among the sandhills at the foot of the mesa, with the exception of 2 on the first mesa, 1 on the second mesa, and about 20 on the third. Oraibi is built on one of the lower "benches" of the third mesa. The sands have drifted over the bench toward the north and northwest, forming large hills, which have all been covered with peach trees. The peach, vegetable, and melon crops are worth at least $10,000 per year. The Indians eat great quantities of the peaches when ripe and dry the remainder for winter use.

... The individual landholders number 285, the areas being from 1 to 16 acres .... (Op. cit. p. 48)

... As indicated by the schedules, they are an agricultural people, sustaining themselves by growing a little corn, beans, chili (red peppers), and many melons and peaches. To those of us living in this arid belt, who grow nothing except by irrigation and with the idea that nothing can be grown here (with the exception of potatoes) without it, the success of the Indians in agriculture is a wonderful revelation, their farms, many of them, being miles away from the villages they inhabit, located in valleys totally devoid of water, 600 to 1,200 feet below them, involving the necessity of carrying all their products, fuel, and water on the backs of their men, women, children, and burros, these long distances up the steep sides of their several mesas...

In consequence of their farms being so widely scattered, and their total ignorance of anything like acreage, quantity, or value, I have labored at a great disadvantage in arriving at a reliable report of the extent of their farming interests, but after having thoroughly drilled my Indian interpreters in areas and viewed their farms in passing to and from their villages, I feel that a very fair approximation has been reached, as found on the schedules.

"The probable wealth and wages earned" is a problem beyond my ability to solve, as they grow very little to sell beyond their own necessities, but always reserve 1 year's supply of corn on hand for fear of a failure of the growing crop. Their peach orchards and the fruit are marvels in size, quality, and product. Many of these they dry upon the rocks.... (Op. cit. p. 50).

There is ... a present greater necessity than lack of water confronting these peaceful and industrious people, that is wood for fuel. The mesas 7 to 12 miles around have been completely denuded of every vestige of wood or timber. They now have to go to remote canons and distant mesa tops for their supply. (Op. cit. p. 63).

... During my first visit in 1890, and later on the second visit in August and September, 1891, I arrived at the following conclusions: the Moquis are an entirely peaceful and industrious people, self-sustaining, supporting themselves by agriculture, stock raising, and the manufacture and sale of pottery and basket work. The villages, or pueblos, are from 700 to 800 feet above the valleys, and wood has to be brought by men and donkeys, or burros, a distance of 6 to 8 miles, while water, obtained from springs at the bottom or base of the mesas, has to be brought by women in jars 1 to 2 miles, up well-worn paths along the sides of the mesas to the villages. ... Their corn and wheat fields are along the washes and in the valleys... Small brush

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houses are built near the grain fields, in which the watchers remain during the growing season to keep off the ravens and other birds... Peach orchards are plentifully sprinkled among the rolling sand hills which bank up against the sides of the mesas. Some are planted on the top of the mesas, where there is sufficient earth and sand to hold moisture... On the first mesa, about 1 mile north of Tewa, are 2 large orchards covering from 3 to 5 acres, and 3 miles further north, on the west slope of the mesa, there are fully 20 acres of peach trees of great age and still yielding abundance of fruit; the trees are planted along lines on the walled terraces, which are daily watered through small ditches running along each terrace, ingeniously contrived to receive and distribute an abundant supply of water from a large spring up and under the first bends of the mesa. This spring is called "Co-nell-a-bah", sheep spring.

The Navajos have made frequent raids upon this place with their herds, so that there are now acres of peach orchards gone to waste through the destruction of portions of the terraces and trees. These terraces are all on the north side, from which direction the Navajos come.

A mile to the north of Tewa, around a spur of the mesa, are the terraced gardens of Weepo (onion springs), where the water supply is quite as great as that of Co-nell-a-bah. These gardens are used by all the Indians of the 7 pueblos or villages. There are hundreds of acres of these peach orchards, and they are found in the most out of the way places, wherever there is sand which will hold moisture. The sands have drifted over some of them so deeply that the tree trunks are lost to sight, the limbs emerging like the blades of the yucca plant from the drift about them. It is impossible to accurately state the aggregated acreages of these orchards, and equally difficult to estimate the actual acreages of their cornfields. It is believed that between the 7 pueblos or villages there are 3,000 to 3,600 acres of corn lands, and there are certainly 1,000 or more acres of peach trees. (Op. cit., p. 64).

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IV

Hopi Land Use (Especially that near the Mesas)

The Hopi "tribe" is made up of people now living in twelve villages. Colton explains, "We know that their ancestors have occupied the same region for over a thousand years and one town, Oraibi, is still on its old site." (Colton, H. S., "A Brief Survey of Hopi Common Law," Hopi Customs, Folklore and Ceremonies, 1954, p. 1; originally printed MNMNA: 7:6, 1934). Some of these villages might be termed "suburb villages," occupied by little groups which have moved out from the mother village for one reason or another but who still recognize their loyalty to that mother village, at least until the new group "incorporates," if ever. Colton points out the autonomy of these villages which "do not form a tribe in the ordinary sense of the word," and draws a comparison to the old Greek city-states:

> They are a group of independent and semi-independent towns with little but common customs and in most cases a common language, to hold them together. They are as independent as the Greek cities at the time of the Trojan war. One town, Oraibi, has a colony, Moenkopi, even as Corinth had a colony at Syracuse. Notwithstanding the fact that the people of the towns are similar in many ways, yet the towns differ in certain customs. Eleven of the towns speak the dialects of a single language so that they can converse together, but the people of Hano speak a totally different language.
> ...There is no tribal government.
>
> In the Rio Grande region of New Mexico, we do not speak of the Tanoan Tribe just because the people of San Ildefonso and Santa Clara speak dialects of the same language, nor do we speak of the Keresan Tribe because Acoma and Santo Domingo speak the same language. The Hopi towns are just as independent of one another.
>
> As in the Rio Grande pueblos, each town has its own town lands acquired in ancient times, but unlike the Rio Grande pueblos patents to these lands were never issued by the Spanish government. The Bureau of Indian Affairs has tried to administer the Hopi as a tribe when there is no political unity linking up the pueblos. Administrative troubles have arisen from this point of view.

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The local government of each independent town is the same as the pre-Columbian government. The ancient town government consisted of a Pueblo or House Chief, Ki-ke-mong-wi, assisted by a Council of Elders, one or two town criers, and a few warriors led by a war chief who seem to have had police power. The House Chief-ship is hereditary in a royal family. At Oraibi and Shungo-povi the royal family is the Bear Clan, Mishongnovi, the Crow Clan, and Walpi, the Horn Clan. The chief's term is for life. Before his death he appoints a successor from his own clan, a brother, a sister's son, or a cousin on his mother's side. For good cause he can be impeached by members of the One Horned Society.

The council is composed of heads of clans. The clan chiefs are selected in the same manner as the house chief. Each serves for life and each appoints a successor before his death, his brother, or son of a sister.

The council has but one stated meeting a year, at the time of the Soyal Ceremony, in the middle of December. At the December meeting the chief business seems to be certification of successors to aged councilors, the recounting of clan traditions and other ceremonial matters. Other meetings are held in the Chief's Kiva, Mong Kiva, at the call of the chief. Here general pueblo problems are discussed.

The people abide by the decisions of the council as a rule but the jurisdiction seems very limited. Individuals who cannot settle their own differences sometimes appeal to the council. Its principal business seems to be the planning of ceremonies.

.... We can find a very close parallel between the Hopi town government and the government of Rome at the time of the Kings, i.e., before 510 B.C. There we find a King (Rex) hereditary in a certain family (Tarquins) supported by a council (Senate) made up of representatives of the families (Gentes). The only difference between a Hopi town and Rome was that the Roman gentes passed through the male line and the Hopi clan through the female line. The former is patrilineal and the latter matrilineal. (Op. cit. pp. 1, 2).

Tietiev's explanation of Hopi organization adds detail to this picture:

"Each village chief's jurisdiction is strictly limited to his own pueblo; there is no recurrent occasion when all the Village chiefs meet together; and there is no such thing as a tribal council. Politically speaking, the Hopi can hardly be called a tribe, and apart from their participation in the Pueblo revolt of 1680, there is no record of a co-operative action embracing all the Hopi towns." (Tietiev, 1944, p. 67) (Footnoting this statement, Tietiev explains: "In recent years attempts have been made by some

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of the younger men as well as by the Office of Indian Affairs to organize the Hopi on a tribal basis. There has been little success to date (1944)." (Op. cit., Note 61, p. 67).

From a practical point of view, the social structure of every Hopi town is made up of a number of matrilineal clans, each comprising one or more closely related households. Despite a nominal allegiance to the Village chief, each clan is to a large extent autonomous, choosing its own officers and transacting its own affairs with a good deal of independence. Since a clan owns land, houses, gardens, and water rights, it is virtually a self-sufficient unit. Only the rule of exogamy and the custom of matrilocal residence force it to co-operate with other groups. Even so, its solidarity is scarcely disturbed by marriages, for a married woman retains an unaltered status in her household and clan, and a married man preserves many ties with his natal group evencafter he has shifted his residence to an affinal household. Furthermore, the clan absorbs the limited or biological family through the agency of its constituent households, and in many ways it forms so cohesive a group of kindred that it tends to resist assimilation into larger units. In short, Hopi society consists of a number of closely-knit matrilineal clans which are loosely combined into phratries and villages. (Tietiev, 1944, P. 69).

To understand Hopi land ownership and use, it is well to first examine native concepts in this matter and then to consider available evidence of such use. One can say that, as among all peoples, land is thought of in two primary categories, agricultural and other, but this division is too simple to even outline the picture. Moreover, although Hopi agricultural and some other land earlier was considered to be owned by clan and by village, and the non-agricultural land (with certain exceptions) by the village and tribe, the idea and practice of individual ownership has crept in during recent years to elaborate matters. Navaho encroachment, beginning before Navaho incarceration at Ft. Sumner and much accelerated after Navaho liberation because of their crowding toward the west as a result of loss of their former more eastern holdings and also because of establishment of trading posts at Keams Canyon, understandably resulted in a series of official and unofficial protests by the Hopi, of which we have record as far back as 1850 (Donaldson, 1893, p. 24).

Hopi-Navaho intermarriage has added a final touch of entanglement to the pattern of land use, especially--though not entirely--on the eastern periphery. Gordon Page, then of the Bureau of Economic Surveys of the Soil Conservation Service, sketched the situation as it has existed in the more recent period (Page, Gordon, "Hopi Land Patterns," Hopi Agriculture, Museum of Northern Arizona Reprint Series, No. 5, 1954, pp. 8-16, originally in MNMNA: 13:2, 1940).

The Hopi, like some of the other Indians, in boundary discussions may claim the American continent from ocean to ocean (Page, op. cit., p. 8). This is merely a reflection of the idea that America originally belonged to Indians and that the Hopi, according to their origin legend (the basis of native conservative thought and explanation, even as the Old Testament is to white Fundamentalists) found themselves as first inhabitants of the earth when they came up from the underworld. The second and more realistic Hopi claim "approximates the area formerly occupied by the ancestors of the clans which now make up the loosely organized 'Hopi Tribe.' This is an area bounded roughly by the Colorado-San Juan Rivers to the north, the present Arizona-New Mexico state line on the east, the Zuni and the Mogollon Rim to the south, and the San Francisco Peaks to the west" (Page, op. cit., p. 8). Page's statement here is accurate if one does not take it literally, for the Hopi claim - and justly - that they are a people made up of groups from many and often distant areas; we know that in the historic period they received additions from the Tewa, Tano, Tiwa, Keres, Jemez, and Zuni-speaking pueblos of New Mexico, some of whom returned to their former homes, while other amalgamated with the Hopi and thus lost their identity (except

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for the Hopi-Tewa, who still retain individual status, although officially form a part of the Hopi tribe, and intermarried with the Hopi). Hopi legends indicate earlier additions probably from the Gila and Salt river areas of Arizona, and there is evidence of additions from Mesa Verde, as well as from the nearer areas covered by their claim. This claim actually represents the later homes of some of the groups about to join the Hopi, and the original homes of others who later became Hopi, as well as what we might call the Hopi nucleus, inhabitants of the prehistoric pueblos of the Hopi Mesa and Jeddito country and the Kayenta area near Navaho Mountain, plus somewhat later art prehistoric arrivals from the Winslow area on the Little Colorado and probably from farther south on the skirts of the White Mountains, as well. Pottery sequences and legend agree in substantiating these Hopi ancestral lines. At present, as Page explains, this is "an area of shrines, sacred natural features, eagle trapping locations, and regions where salt is obtained. It is necessary to realize, concerning this second claim, that actual use is not the important thing. What is important is that this area be recognized as a sacred area. Use is made of it by priests who visit the shrines to perform certain rites, to trap eagles, and to gather various herbs and minerals necessary to their rites. The Hopi does not think of this region as an area to be used for agriculture or for exploitation of the natural resources." (Ibid)

Within this large "sacred area" (formerly their hunting area, as well), they recognize their cattle range and their agricultural lands as distinct entities. In major land disputes (usually with the Navaho) the claim to what Page calls the "sacred Area" is set forth first, and later

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discussions may come to what we may call the practical claims on the basis of present economic use. But to the Hopi, the entire area is involved in "practical claims on the basis of economic use" because these people, like the other Pueblos, believe that all of their economy is absolutely dependent upon carrying out prescribed religious affairs, as well as upon tending to what we think of as the duties of agriculturists, herdsmen, etc.

The basis of Pueblo life is religion, not primarily as a matter of ethics but as the force which keeps nature functioning and is absolutely necessary to man's welfare. Religion is not a matter of services on a few certain days set aside but of the concentrated efforts of a series of religious groups functioning in specific successive periods throughout the year and involving all the people at one period or another. A hint of the importance of religion to the Hopi is indicated by the fact that if one adds all the days devoted to large and small ceremonials by one group or another in a single pueblo, he finds about 200 days so dedicated per year, in comparison with our 52 Sundays and a handful of other religious occasions. (Needless to say, each Hopi is not involved in each religious affair.) Attention to the round of ceremonials is considered to be absolutely necessary if crops are to grow, animals and man to propagate, and the seasons to continue in their proper successions. The first duty of a Hopi is not to himself or to his immediate family but to the religious affairs of his group, for by means of these the tribe (including himself and family) and the entire world - as they expressly explain - is enabled to continue and flourish. For years the Rio Grande Pueblos have tried to persuade the Hopi to exclude whites from the public portion of their ceremonial dances, etc., because katcinas are shown which in the Rio Grande have been secret since Spanish days. The Hopi have

continued to refuse this request, saying that if the non-Hopi on-lookers behave themselves discreetly, it is good that they should be there in numbers, for the success of the ceremony depends upon the good thoughts of audience as well as the thoughts and performances of the actual participants, and the world, rather than just the Hopi, will profit.

When various groups came to join the Hopi from time to time in the past, each was asked what it could contribute to tribal welfare. The accepted answer (and this the price of the new lands, springs, and associations) was a ceremony which, upon demonstration, appealed to the Hopi nucleus as "practical" in achieving the end claimed. These ceremonies then became the most important of the perpetual civic duties, or taxes, of that joining group. The ceremonies required materials which had to be provided by that group or by associated units, and such materials had to be obtained from certain specific places (sometimes not available elsewhere). Such spots and shrine areas, where spirits of supernatural hovered or visited, could no more be changed in location than Lourdes, Jerusalem, or other Christian shrine areas could be re-located. It is not an exaggeration to state that the Pueblos are as concerned over the fact that some of their shrines are in areas no longer considered to be in the possession of their tribe as the Crusaders were of the possession of the Holy Land by Moslems.

Specific evidence of location of shrines and of spots from which religious materiel has been obtained for centuries warrant serious consideration in the claims of such a group.

Salt gathering, an activity which might be considered as primarily economic but which was involved with the belief that Salt Woman had been at that location and left traces of herself for future use of the people is a

native activity involving claims to locations visited - providing that ownership rather than mere inter-tribal use is indicated. Taking salt from such areas was accompanied by ceremonial procedures representing gratitude to Salt Woman for her gifts, as well as attention to an extended series of shrines passed in transit.

Hunting, likewise carried on within the large outer area was of much more importance in the past than today, when use of such domestic animals as sheep and cattle has largely supplanted use of wild game, with herding supplanting hunting in part.

The basic Hopi home territory of villages, fields, and flocks is much smaller than the outer area. Cattle today move at some distance from the mesas but sheep are kept in a more restricted area because they require more care than cattle and the Hopi, as village Indians, prefer going out from home to their flocks (even as they go out some miles to their fields), rather than living out in sheep camps, although some Hopi do use such camps. Others hire Navaho herders.

It is obvious that the various activities utilizing the large "outer area" (a better term than "religious area") and the smaller "home area" should be considered separately, with what detail is available. Working from the inner area outward provides a factual approach.

HOME AREA OF VILLAGES, FIELDS AND FLOCKS.

Agriculture: Farm lands originally were considered to be all clan owned, a system which continues today (although individual ownership also exists). The basic pattern of clan ownership is explained by tradition. In the move of the Hopi nucleus to their present area, the Bear clan was first to arrive. These people settled near the spurs of First and Second Mesas and began to farm in washes which drained Black Mesa. As other clans appeared, the Bear clan gave them permission to settle and granted clan

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allotments. The Sun clan was last to arrive and received blocks on the edge of the other clan allotments. The "clan mother" (oldest female in leading lineage within the clan) granted planting areas to families and settled disputes within the clan; land disputes between clans were settled by the village or house chief (Kikmongwi). This "clan block system" was in use until late in the 1800's, but "clan land" has shrunken considerably since that time. (See Page maps, "Land Use Pattern Before 1900," and "Land Use Pattern, 1939," made up for Soil Conservation Service, Op. cit. p. 9). That Oraibi carried this "clan land" pattern in the past is indicated by Stephen, who lived among the Hopi for some years in the late 1800's and reported evidence that Oraibi land formerly was divided for use of families composing clans and not as individual holdings. (Stephen, 1936, p. 17.) Such clan holdings existed in the Oraibi Wash until the split of Old Oraibi in 1906, when only the Progressives, making up less than half the original population, were left at Oraibi on the mesa top and New Oraibi at the base, and the Conservatives moved to Hotevilla and Bacabi. "Conrad Quoshema of Oraibi says that Lomavayuoma, his grandfather, told him of clan lands extending from what is now Well M 60 along both sides of the Oraibi Wash southward for five miles. Lomayouma also stated that the Bear clan, of which he was a member, controlled the best blocks of land situated on the wash near the present site of New Oraibi." (Page, Op. cit., pp. 10, 11.) Before the Oraibi split, some individuals had begun to encroach on the clan blocks, causing confusion, and the sanctions applied to land rights had lost some of their significance. The tendency toward a break up of clan lands on Third Mesa was accelerated by the revolt (though Tietiev indicates that they still exist), at least in part, and individuals using clan land continued

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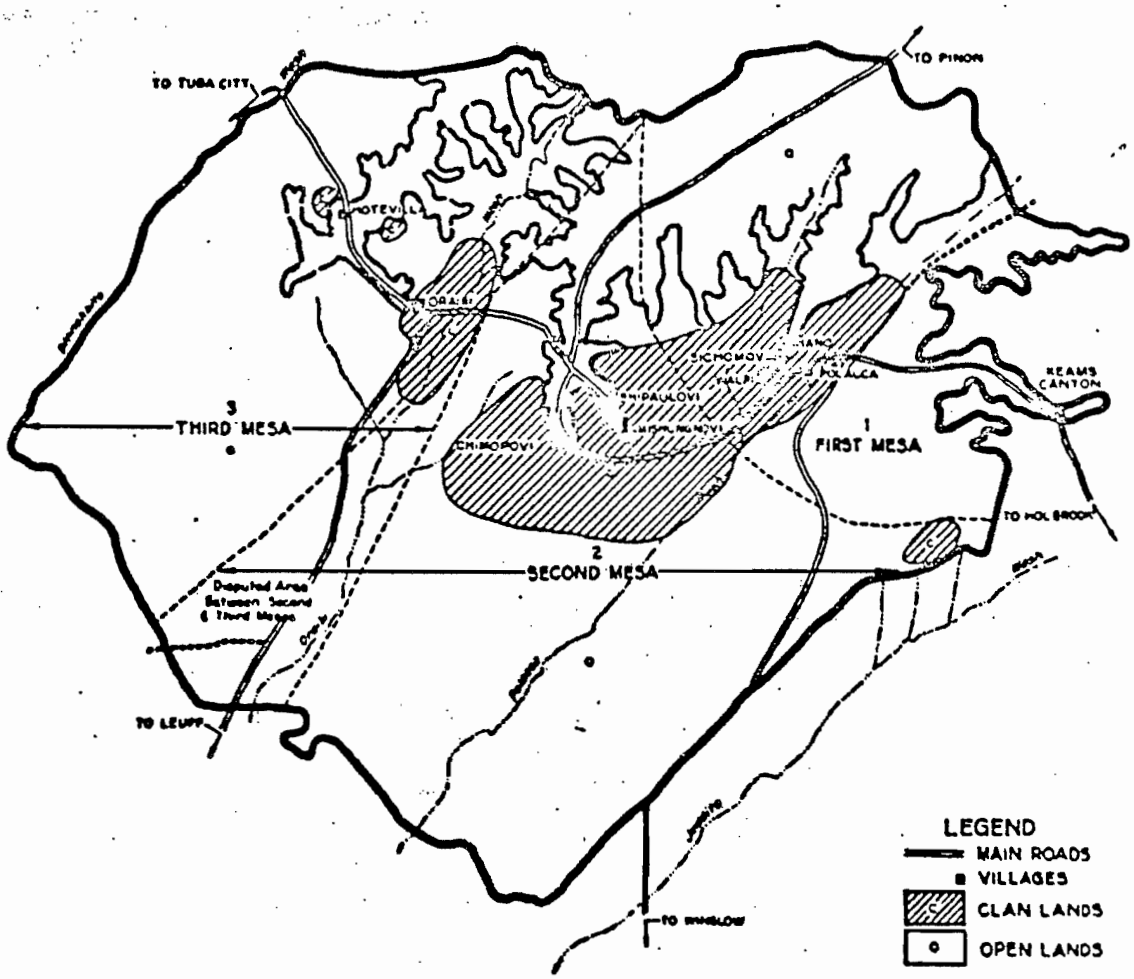

LAND USE PATTERN
BEFORE 1900 A.D.
BASE MAP-HOPI UNIT

Fig. 1. Map of Hopi country showing land in use before 1900.

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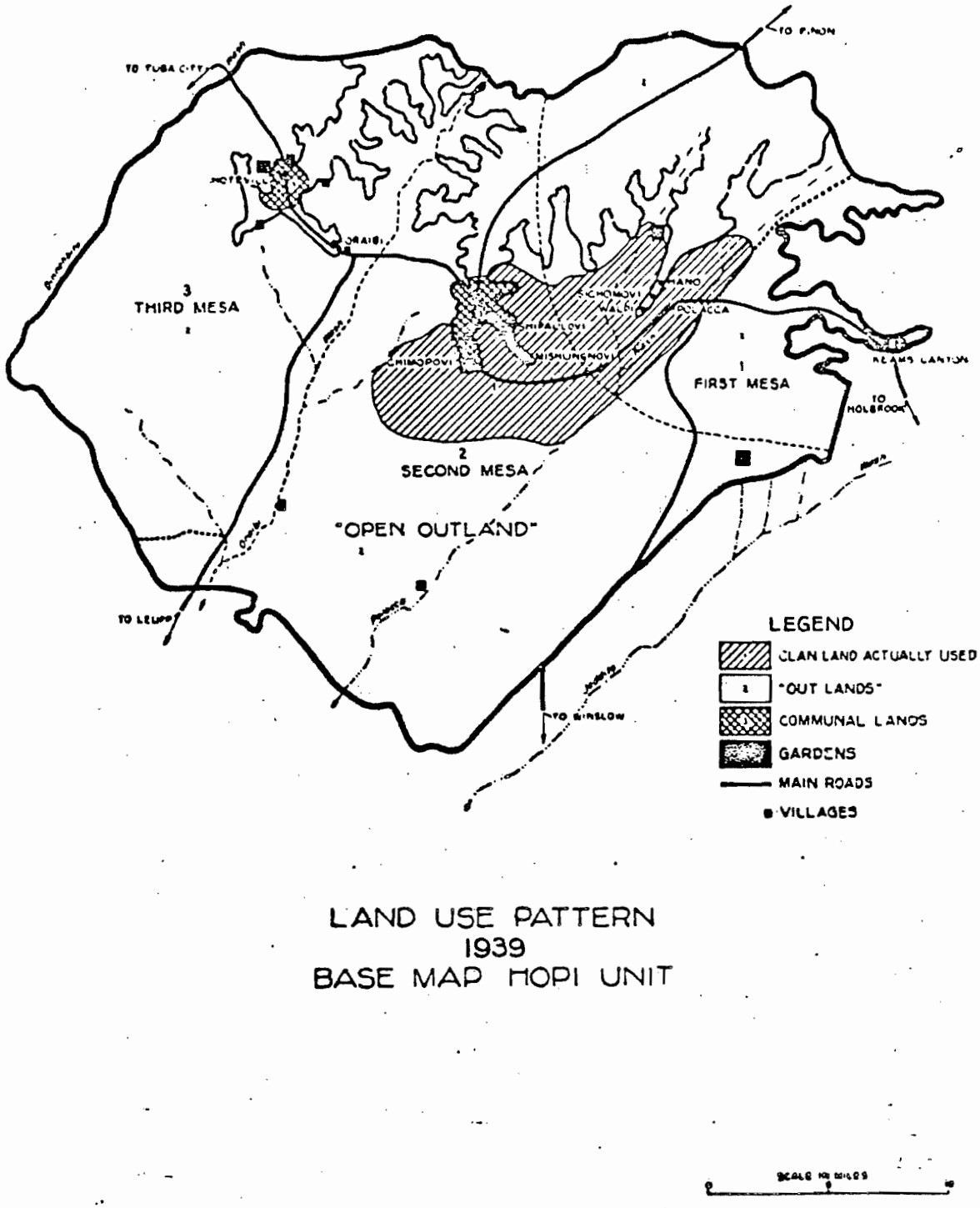

LAND USE PATTERN
1939
BASE MAP HOPI UNIT

Fig. 2. Map of Hopi Indian country showing land use in 1939.

such use but on an individual basis. Those who needed more land than that provided by clan blocks or who wished to use lands away from the old agricultural areas, cleared locations for new farms. On First and Second Mesa, however, the clan block system continued to hold, though new lands could be opened and used by individuals of the villages of those mesas, provided they kept within the area used by their own village, were not on clan block land, and were approved by the nearest neighbors (Op. Cit. p. 12).

A well defined boundary exists today between First and Second Mesa, apparently based on land claimed by the house chiefs of the first groups to settle in the area. The boundary between Second and Third Mesa is disputed, but a compromise has been acknowledged, with Oraibi Wash as a boundary.

The best description we have of Hopi village lands and boundaries is that resulting from C. Daryll Forde's First Mesa Study (1931, pp. 366-370), in which he points out not only existent boundaries, carried down from the past, but also the ways of laying these out, including "sight lines," typical of native land delineations in New Mexican pueblos, as well as at Hopi.

Village Lands and Boundaries

> The present villages of the Hopi are perched on the summits of the mesa tongues, but the retreat to the mesa tops is relatively recent and followed the disturbances of the late seventeenth century when Spanish interferences and the raids of other Indian groups, particularly the Ute, induced them to resort to these defensive positions. The lowland predecessors of the mesa villages are well known to the Hopi, and they are aware of the recency of their desertion, but they resist all attempts to induce them to return to the valleys. . . On First Mesa are the three villages of Walpi, Sichomovi and Hano. Walpi is the oldest settled. Sichomovi is an extension of Walpi rather than a separate village. They are separated only by a hundred yards where the mesa narrows to a neck a few yards wide, and the clan and society organizations of the two villages

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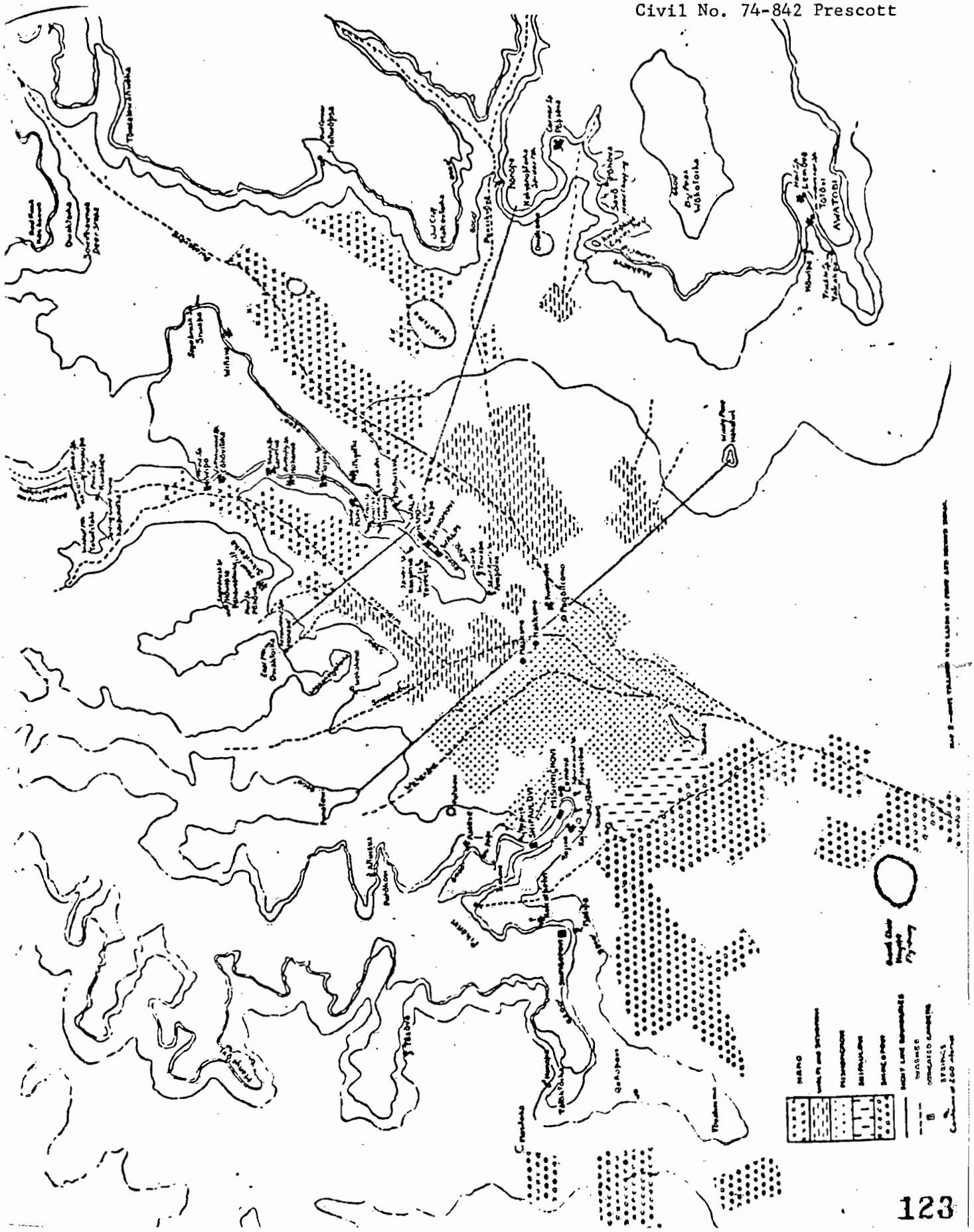

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form one system. The joint ownership of land confirms the evidence of clan lists and the statements of informants as to the recency of the movement. Dr. Parsons has also pointed out that Sichomovi "should be described as a suburb of Walpi. Not having its own winter solstice ceremony it is not an independent town."

The third village, Hano, is occupied by an alien group, the descendants of Tewa immigrants from the Rio Grande. Traditionally these people came to First Mesa at the beginning of the eighteenth century at the request of the Hopi to assist in defence against the Ute. They established their village at the head of the main trail up to the meaa top, near the transverse notch across a narrow neck which is known as the wala. . . These First Mesa villages farm land in the valleys or washes on either side of the mesa peninsula; on the Polacca or First Mesa wash to the south and on the Wipo wash to the north. The Hano fields are above, i.e. upstream from the wala, Hopi, i.e. Walpi and Sichomovi, land is below. According to a tradition repeated by several of my informants, bargaining over the allotment of land took place when the Tewa people first immigrated and the boundary was then fixed as eight lines from the wala to eminences on the far sides of the washes. According to Hopi informants the boundary across Polacca wash runs to kokyanoptoika (Spider Mountain). This connects closely with the present de facto boundary; but according to the Tewa the latter represents an encroachment, the original boundary was planned to run to kwatipkya, thus giving the Tewa more land. One Tewa informant claimed that the Hopi at a later date agreed to shift this boundary southward so that it ran from a point on the mesa between the houses of Hano and Sichomovi. . . This claim, if correct, has never been put into effect. On the Wipo wash the sight line boundary runs, according to the Hopi, to the summit of Owaktoika (Coal Peak).

The villages of Second Mesa farm land on the low lands adjacent to their villages and out on the Polacca wash to the south. The boundary between First and Second Mesa land is considered to run along a sight line from ponotowi on the north to the isolated eminence of hokatwi in the south-east. A number of minor eminences in the valley and approximately on this line serve to mark out this line on the ground. Mishongnovi land therefore includes that flooded by the ephemeral stream emerging from the mesa immediately west of ponotowi. The boundary is considered as defined near the washes by the series of natural features referred to, i.e. two low sandhills mastcomo (Dead Men Hill) and naktcomo to the north of Wipo wash and by another low eminence pagoltcomo between the Wipo and Polacca washes and a large unstanding rock to the south of the Polacca Wash. On each of the low hills

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there is said to have been formerly a large boulder marking the boundary site. The naktcomo stone, according to Lomanaksi and other Mishongnovi informants, was standing until a year or so ago; it consisted of an upright natural rock slab facing north and south and supported on the south by stones. The north face was incised with a horizontal T, whose leg pointed towards First Mesa. Mishongnova land is bounded on the west by a line running south-eastward from kojita, a small hillock near the eastern foot of Second Mesa. The village of Shipaulovi was settled by immigrants from Shimopovi, the westernmost of the Second Mesa villages. Its lands are limited to a small area carved out of the Shimopovi lying south of the hillock tokavo. These lands are now considered inadequate, and the "land question" is such a sore point that the elders of Shipaulovi refused to discuss it. Information could only be obtained from residents in Mishongnovi and a Shipaulovi emigrant to Shimpopvi. Shimopovi lands extended southwards across the Polacca wash. On the west they march with those of Oraibi. My Shimopovi informant claimed that the lands of his village had formerly extended to the thalweg of the Oraibi wash and even beyond it, but that the accepted boundary to-day ran parallel to the wash on the Shimopovi side from the peak manyaovi. Oraibi views on this boundary were not obtained.

Clan Lands

Within the village territories the greater part of the arable area is divided into a number of large sections from a few hundred square yards to a square mile or more, apportioned among the various clans. The number of clan lands identified for the villages of First and Second Mesa are as given in tables 1-4.

Summary of Tables 1-4 (Op. cit. pp. 400-401)

		Clan	Lands
First Mesa: (Walpi and Sichomovi, only)	1.	Snake	2
		(Sand)	1
	2.	Water	3
	3.	Deer	6
	4.	Coyote	3
	5.	Rabbit	3
	6.	Badger	2
	7.	Bear	3
	8.	Sun	4
		(Reed)	3
	9.	Katcina	3
	10.	Mustard	4
	11.	Squash	1

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	Clan	Lands
Second Mesa: (Mishongnovi)	Parrot	5
	(Katcina)	3
	Bear	4
	Fire	3
	(Coyote)	3
	Badger	2
	(Butterfly)	2
	Squash	4
	Chicken Hawk	4
	(Eagle)	1
	Sprouting Corn	7
	Water	5
	Lizard	7
(Shipaulovi)		
	Bear	1
	Sunhead	1
	Squash	1
	Bear	6
	Strap	2
	Bluebird	1
	Corn	3
	Water	3
	Snow	2
	Katcina	3
	Sun	3

[Also Shongopavi]

These clan lands were formerly delimited by numerous boundary stones (kalalni) placed at the corners and junction points. Many of the more signigicant of these kalalni, which were small upright slabs or domed boulders, were engraved on their faces with symbols of the appropriate clan. Some of these boundary stones are still in position. A Cloud (Water)-Tobacco (Rabbit) kalalni still stands on the Polacca Wash below First Mesa. A Coyote stone is to be seen in the Mishongnove fields at Second Mesa and a Corn Clan stone was recently removed.

. . . The lands vary considerably in size so that no clear idea of the variations in aggregate area available for the several clans is given.

. . . The area available does not correspond at all closely with the number of individuals in the clan. In some the population has dwindled to a dozen or so persons, but extensive lands are available, e.g. Coyote and Snake at First Mesa (Hopi), Katcina and Corn at Mishongnovi, while others far larger have no more or even less land, e.g. Rabbit at First Mesa (Hopi), Badger-Butterfly at Mishongnovi. With very few exceptions, however, every clan has land in two or more separate parts of the arable area. Most of both the Tewa and Hopi at First Mesa have lands on both sides of the Mesa, i.e., on the Wipo and on the Polacca washes, while only the Bear and Corn Clans of Tewa and the extinct Hopi Squash Clan have but a single land.

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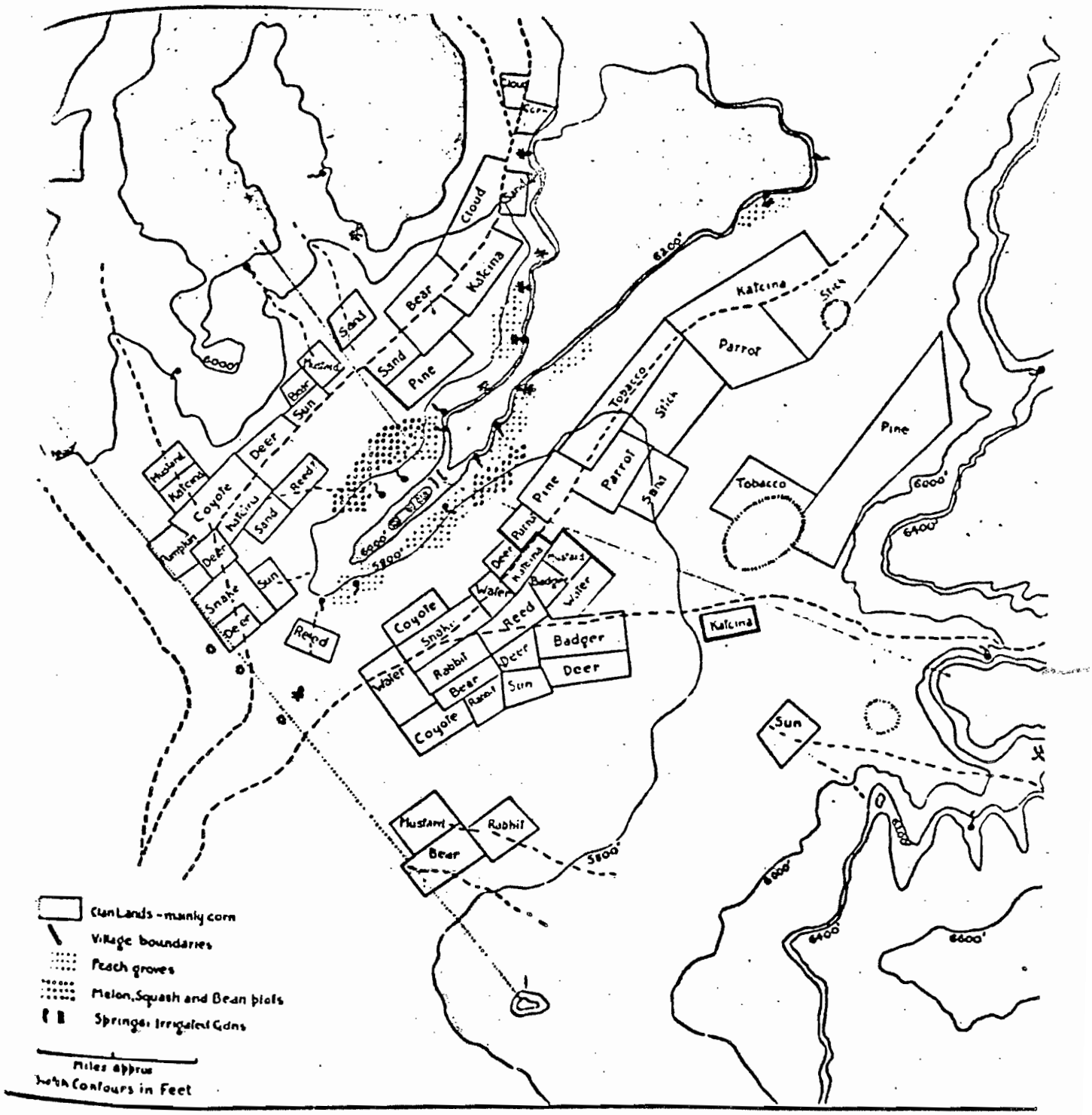

MAP 3.—CLAN LANDS: FIRST MESA.

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Mishongnovi fields are watered by the wokovova to the east of Second Mesa and to the south-east by the Wipo and Polacca washes in the neighborhood of their confluence. Only three clans have but a single land and most have lands on both the east and south-east of the mesa.

Shimpovi lands lie in four major groups - to the south of the mesa escarpment, to the west of the mesa, in the flood area of the small wash running down from pikanvi, and lastly on the First Mesa wash below the junction of Wipo and Polacca, especially the area immediately above Giant's Chair (hoyape - fly away) which apparently tends to hold up seepage on its east side. Four clans have but a single land, but three of these are now merged with others and the lands are only nominally distinct.

The relatively small area of Shipaulovi land is divided among three clans. Squash people have but recently come to the village from Shimopovi and have apparently been given fields within Sunhead land.

This dispersal of the lands of each clan over a number of sites is of very great practical importance since it reduces the risk of crop failure; where one group of fields may be washed out there remains the chance that the others may be spared. Disastrous floods do not usually occur in both the Wipo and Polacca washes in the same season. The lands at the foot of the scarps and those out on the washes are still more definitely reciprocal. In an abnormally wet year many fields on the washes are liable to be destroyed by the high floods; in such a season, however, the scarp run-off is likely to be high and the fields at the foot yield well. In a dry season, however, when the latter are liable to be parched out, enough water is usually brought down by the major washes from Black Mesa to afford a harvest for the mid-valley fields.

In addition to the main clan lands which are devoted principally to corn, smaller patches on the sloping grounds closer in to the mesas are planted with beans, squashes and melons. At Mishongnovi these were, according to Robert and Lomanaksi, grouped in clan divisions as for the main fields. . . At the other villages these bean and squash patches on the slopes were apparently not regarded as clan land and were disposed of by individuals as personal property.

The irrigated gardens and all springs were associated with particular clans. . . But the water of springs is available for drinking, irrigating, or stock watering, as the case may be, to individuals of clans other than those "owning" them or mythologically associated with them. . . The irrigated gardens at Awatobi are considered at Mishongnovi to belong rightfully to their Badger Clan, since that clan is believed to have migrated thence when Awatobi was destroyed or deserted. . . At present individuals from both mesas have gardens below Awatobi, but

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First Mesa, with its numerous home springs, sets less store by them than the Mishongnovi people, among whom Awatobi figures prominently both in legend and in economic life.

The families composing each clan cultivate fields within the clan lands. At the present time there is, except perhaps at Shipaulovi, no shortage of land and the cultivated fields rarely occupy more than one half of the total clan lands. But the whole area of a clan land is rarely available for cultivation, since flood and blown sand are continually spoiling land, severe flood may wash out the soil, sand may accumulate and render it sterile, and the value of a given patch may be completely changed by the events of a few seasons (or even a single one). Freedom to shift the boundaries of plots is essential under a system of cultivation which is dependent on the distribution of natural floodwater and hence on minute changes in surface topography.

. . . The family fields themselves are, where possible, not confined to a single stretch of clan land but are scattered over the various sections held by the clan. . . . The family fields within the clan land are not marked by kalalni, but their extent is well known to members of the clan concerned. A stone or small post may be put at the corners and the boundaries are considered to run along sight lines between them. Fences are erected only to protect plants from the severe winds, to keep off blown sand or to exclude livestock. Where cultivated land is partly concealed in a depression or fully, then the cultivator generally erects small piles of stones on the high ground to either side to warn others against driving their sheep over the field. A line of such stone piles flanks the plots along the modern wagon road as it approaches Second Mesa from the south-east. At the present time the plots actually cultivated rarely occupy the entire fields at the disposal of the family. (Ford wrote before Hack's studies had indicated the value of sand-covered lands in Hopi agriculture. However, movement of a sand dune onto a Hopi field is different from having a sand covering to the field and may, indeed, ruin it for agriculture.)

An example of the close intertwining of agricultural land, clanship, and religion in Hopi thought is illustrated by Tietiev who was shown a sacred stone (duplicating in form and function, though not in specific markings, a sacred and secretly kept stone said to represent land boundaries at Zia Pueblo: see Ellis, Land Claim Report for Sia, Santa Ana, and Jemez Pueblos) said to have been brought from the Underworld by Matcito, legendary founder of Oraibi and their absolute proof of the ownership of their area by the Hopi;

This stone is supposed to have been kept in the custody of the Bear clan from the beginning and is zealously shielded from profane observation because its markings are believed to convey Matcito's intentions regarding the control of Oraibi's lands. . . It is a rectangular block of grayish-white smooth-grained stone, about 16 inches long, 8 inches wide, and one and a half inches thick, splotched here and there with irregular red dots which the chief interprets as points of land. On both sides there are lightly incised markings. . . . (Tietiev, 1944, p. 60.)

Tietiev goes on to describe dots representing thunder clasps, a Katcina figure, lines to indicate the eight day period of Soyal (Tribal Initiation), etc. on one side of the stone.

The pictures on the other surface of the stone tell a connected story. A double rectangle in the center is supposed to represent the Oraibi domain. About this are grouped six figures which depict the Soyal officers. Reading from the bottom is a counterclockwise circuit, they refer to the Village, Pikyas, Parrot, Tobacco, Crier, and War chiefs. Each figure stands with the left hand across the chest and the right extended downwards to cover the genitalia. This posture is said to indicate that the chiefs are claiming the land inclosed within the central rectangles. Along the edge representing the east, there is a line of small scratches, interspersed with occasional circles or crosses, which depicts the proper Hopi path that the chiefs are supposed to travel. The War chief brings up the rear to make sure that no one turns aside from the correct road.

At each Soyal celebration the sacred stone is brought from its repository, the officers examine it closely and then reaffirm their rights to hold office and their claims to the land.

. . . A composite summary of several myths is needed for an understanding of the connection between the authority of the chiefs and their claims to the land. (Op. cit., pp. 60, 61.)

In 1889 this stone was brought out from its hiding place to show the army officer who brought soldiers from Ft. Wingate, when the people of Oraibi were much angered by a government survey party sent to measure out plots for individual family holdings. Fewkes, who saw it only from a distance, was not permitted another view. As far as can be determined, these are the only two instances in which whites were allowed to see the sacred stone. (Fewkes, in Parsons, 1922, pp. 276-277.)

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Tietiev follows with that portion of the origin legend in which the people, upon emerging from the Underworld, found the supernatural Masauu (Skeleton: spirit of death and of the earth) who fed the people from his fields.

> In time the people left Masau'u and set out on the wanderings that were ultimately to bring them to their present settlements. For a while the Bear people settled at Chimopovy but "they all had heard that Skelton was living where Oraibi now is, and so they all traveled on towards Oraibi." The Bear clan leader, Matcito, asked Masau'u to give him some land and to be the chief of his people but Skeleton replied, "No, I shall not be chief. You shall be chief here. . . I shall give you a piece of land and then you live here." Hereupon he stepped off a large tract of land which he allotted to Matcito. Soon other clans began to arrive, each seeking permission to dwell at Oraibi and each offering in exchange to perform a beneficial ceremony for Matcito. If the trial performance proved pleasing to the chief he would say, "Very well, you participate in our cult and help us with the ceremonies," and then he would give them their fields according to the way they came. And that way their fields were all distributed.
>
> Thus do we find the myths "explaining" how present conditions arose, for at Oraibi the leader of the Bear clan is the village chief and the theoretical owner of all the village lands, and all the other clans hold land only on condition of good behavior and the proper observance of ceremonies. For himself the Bear leader was said to have selected a large tract of land southwest of the village, traversed by the Oraibi wash, which was so shallow in those days that its flood waters were a great boon to the nearby fields. (See fig. 5, plot marked Bear.) The western limit of his holdings was marked with a boundary stone. . . on which a Bear claw was carved. A similar stone, marked with the head of Masau'u commemorated that deity's original claim to the entire domain, and boundaries and shrines (pahokovi) were erected at the south and northwest corners. So great a piece of land was reserved for the Village chief that he was able to allot some of it to the War chief (kaletaka) who aided him in the performance of the Soyal ceremony, and to have enough left over to reward the other officers and men who participated in that rite.
>
> Just west of the chief's holdings is another vast plot given over to the Patki clan. When the Bear chief or his delegate impersonates the Eototo Katcine on great ceremonial occasions, the Patki head man plays the part of the Aholi, second in importance. Together they make the rounds of the village on the morning of the Bean dance during Powamu, and Aholi opens the main cistern of the village. It is for this service, as well as for his part in the Soyal, his function as Sun Watcher, and his ownership of the Gray Flute ceremony that the Patki leader gets so

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huge a share of land. Apart from the lands allotted to the Patki clan, the individual who impersonates the Aholi Katcina gets the special plot marked Aholi in the northwest corner of the Bear holdings. Others to share the Village chief's land are the Greasewood (Tep) clan, from which is chosen the important Crier chief, and the Spider (Kokyang) clan, which helps with the Soyal and controls such important ceremonies as the Blue Flute, Antelope, and Momtcit. The Parrot (Kyac) clan, too has a piece of the chief's land because it furnishes one of the main Soyal officers; and the small Patki plot just south of the Parrot lands goes to that member of the Patki clan who dances with stalks and leaves representing crops, during the Antelope rites which precede the public dance of the Snake society.

Here and there on the basis of various traditions, other clans were allotted land as they arrived at Oraibi, but even those clans which had no legendary claims to particular plots were not left landless. A large triangular stretch of ground near the Oraibi wash was known as "free land," on which any resident, with the chief's consent, was permitted to lay out a farm. Anyone who was a good citizen generally received ready permission, and the tests of good citizenship were a frequent participation in Katcina dances, particularly the Homegoing (Niman) dance; readiness to haul wood to the kivas in preparation for important winter rituals such as the Soyal; promptness in responding to calls for communal work, such as the cleaning of springs, or farming for the chiefs; and willingness occasionally to take the responsibility of sponsoring a dance (Op cit., 1944, pp. 60, 61, 62).

Tietiev explains in regard to the "ownership" of plots by the chiefs: "These special plots of ground are supposed to be held by Soyal officers only during their terms of active service. Disputes often arise when retiring officers refuse to cede their lands to their successors" (Note 24, p. 62).

Concerning land ownership today, Tietiev states:

The contemporary pattern of ownership still reflects the traditional scheme. The Village chief is the theoretical owner of all his town's lands; these lands are divided among the clans residing in his pueblo; and each individual farms a specified portion of his clan's holdings. In addition, there is a large piece of unassigned land, part of which may be used by any villager with the chief's consent. Under such a system land is never bartered or sold, and only rarely exchanged. Ownership is restricted to the privilege of use, but this right is so carefully recognized that if a man decides

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to allow some of his fields to lie fallow, no other farmer may use them without the specific permission of the owner. (Tietiev, Op. cit., p. 181.)

Again Tietiev clarifies his statements with a footnote:

In theory, only the women of a clan could hold title to land, so that a man generally farmed on the property of his wife or mother; but in practice it was not unknown for a son to inherit land from his father.

The land holdings of each clan were generally supplemented by small, irrigated gardens, conveniently located on the slopes of mesas to take advantage of natural or imposed overflow from springs. These were owned and attended by women who grew onions, chili peppers, and other vegetables that were regarded as delicacies.

Only the Masau'u and Kokop clans had orchards specifically assigned to their use, but other clans could grow fruit trees on any free soil that was suitable. Peach trees were by far the most commonly grown. They were owned by women in terms of individual trees rather than by entire orchards. Peaches were unknown in pre-Spanish times (Note 3, p. 181).

A youth customarily works a portion of the area of his and his mother's clan's land which his father tends; at marriage a man begins to plant on his wife's land, but if it is not fertile he may continue to work a portion of his mother's land.

Judging from the great extent of the Oraibi domain and the deliberate attempt of the villagers to limit the size of their crops to what is considered only a fair margin of safety, it would seem at first glance that there was surely enough to provide each farmer with as much ground as he cared to cultivate, but the nature of the terrain and the quality of the soil are such that not all the Oraibi holdings are equally suitable for agriculture. Accordingly, quarrels over land are by no means unusual, for the clans occupying smaller or poorer locations frequently show marked resentment towards those which are more favorably situated (Op. cit., pp. 181-2).

Because they lack an outlet for surplus production, the Hopi try never to grow more than they can consume in one year. Corn is the only product that is grown in excess of the annual need, and every household strives to keep at least an extra year's supply on hand to forestall a famine in the event of crop failure (Op. cit., p. 181, Note 7).

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The all-pervading concern of the Hopi with land problems can be fully appreciated only when one realizes how utterly dependent they are on the soil and how precarious such a dependence must always be in the face of an unfavorable environment. Not only is the presence of large deposits of alkali in itself a serious detriment to agriculture, "but when the extreme dryness of the air, the violence of the winds, the elevation of the region, and consequent cool nights, early frosts, and the heat of the sun are taken into consideration, it is a matter of surprise, that plants exist at all." As if that were not bad enough, the rainfall is sporadic and uneven and "the curious thing about (it) . . . is that the rains come too early and too late to be of much use to a large number of plants. Thus June is the dryest month of the year. This is particularly unfortunate since the crops require water urgently during the early growing period." (Tietiev's quotations are from Hough, 1898, pp. 134, 135.)

Luckily for the Hopi much of the soil is very fertile if it obtains sufficient mositure, and the natural topography of the region furnishes them with a supply of water to help counteract deficiencies of precipitation. . . Besides learning to take advantage of under-ground seepage, the Hopi, like most of the sedentary tribes of the Southwest, early developed the technique of flood-water farming which depends largely on the choice of planting sites in such places as are most likely to be flooded in the event of rain. . . In Professor Kirk Bryan's opinion, the Hopi were one of the tribes that practiced flood-water farming prior to the Spanish invasion, and it is interesting to see how the principles of this method of agriculture still operate. Through every large field, especially those devoted to raising corn, there runs the shallow, rather narrow bed of an ephemeral stream whose precious overflow is retained by judicious damming and artificial banking. This is a modern adaptation brought about by the accelerated erosion, which, as Dr. Bryan points out, has been going on since 1880 and has practically terminated flood-water farming in the main valleys (Op. Cit., p. 182.)

The one village of non-Shoshonean-speaking Hopi, the Hopi-Tewa of Hano or Thano (Tewa Village) on First Mesa are basically horticulturists like the Hopi and many families own sheep and cattle, as well. The ancestors of this group moved to Hopi from the Rio Grande, upon Hopi invitation, in 1696. In return for their services as warriors against the Utes, in protection of the Hopi, they had been promised productive fields, springs, food, and women.

something of a delay in providing the "payment," even after the Tewa had defeated the Ute several times, raised a considerable antagonism in these newcomers against the Hopi, and even after the land was given, the Tewa complained that they found it poor and unproductive, not at all as promised (Dozier, 1954, p. 353; 1956, p. 176). Drouths known to have occurred at this period (which the Tewa blamed on the bad hearts of their hosts, a typical Pueblo explanation) no doubt were responsible for some of their disappointments in crops, and the fact that they had been accustomed to a somewhat different type of agriculture in the Rio Grande Valley and Galisteo Basin of New Mexico possibly may have made them temporarily less successful than the Hopi in their farming. The problem of farm land boundaries also came up; the Tewa complained that some of the Hopi encroached on the land they had been given and stole their property. It is said that they considered moving away from the mesa, crossing the west valley to find a suitable place to settle, and sending scouts to Moencopi to investigate the land situation there. The scouts returned with favorable reports, but the Hopi made reparation and the people of Hano, plus a new group of visiting Tewa kinsfolk from New Mexico, decided to remain on First Mesa. Their assigned lands are north of the Tewa Village-Sishamove boundary line, from across Wepo wash on the west to across Palacca wash on the east. Clan plats, like those of the Hopi, are outlined by stones marked with clan symbols. As Dozier points out, the antagonism between the Hopi and this Tewa group was basically a problem of different values in the two groups: the Hopi traits of passivity and peacefulness were interpreted by the Tewa as indicating weakness, while the Tewa aggressiveness and approval of warrior-activities was considered by the Hopi as anything be admirable - even if very useful when protection was needed. (Dozier, 1956; p. 176; Mindeleff, 1891, p. 37.)

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Now both the Hopi and the Hopi-Tewa follow the ingenious farming practices described by Forde and by Stewart (1940, pp. 329-335) and others, using a combination of flood water-irrigated fields, sand dune fields, and spring-irrigated gardens, and not planting all at one time so that if disaster strikes a certain type of field or all fields planted at a given period, the others still may produce enough for harvest. Besides making sure that the proper rituals are carried through, the Hopi is careful to employ "his utmost skill and knowledge" in his choice of cultivable land, considering especially the position of the field in relation to flooding after summer rains and soil differentiation according to the crop he is to plant. He has no system of crop rotation and does not use natural or artificial fertilizer. He usually plants the same area of clan land year after year (though he may leave it fallow for a year) and now may have individual holdings elsewhere, as well. Because the prevailing southwest wind tends to remove from the west side of his field the 6 or 8 inches of top soil necessary to retain adequate moisture for the crops, the custom is to move the boundaries of fields 5 to 10 yards farther east each year. A field continuously cultivated for some years is likely to have had so much top soil blown away that it is too hard and dry for further use at the time. Weeds, sage, greasewood, and other desert plants then are allowed to grow on it so that they may collect and hold freely blowing surface soil. After two or more years such soil is sufficient to again protect the moisture of the subsoil, and the land can be re-used. Dams, terraces, and low brushwood fences, rebuilt each season, are used to check water flow and allow the deposit of alluvium where a deep-cut arroyo reduces the water received by a field. In working the land American tools are supplanting native tools,

though the plow is not of great value because plowing the land makes the soil too light and subject to quick evaporation.

> Besides individually owned land a household of seven or eight persons usually will cultivate the equivalent of about seven acres of land. . . (1937). Informants comment on the fact that the size of the fields and the amount of land cultivated were both much smaller formerly than today because the labor involved in clearing fields with aboriginal implements was too arduous to permit other than the minimum sized cultivations. (Beaglehole, 1937, pp. 36, 37.)

> The soil is not lacking in fertility, but save in exceptional situations the fertility is potential only, and only where quickened by hand irrigation or the seepage of water through talus slopes does the natural fertility grow garden and fruit crops in abundance. Elsewhere only the intense patience, industry, and faith of the Hopi farmer make it possible to gain a favorable living from the land (Ibid., p. 34).

As the Hopi do not raise a surplus even today, cultivation of less land per person in the past would have necessitated more use of wild products.

Capt. Bourke reported many Hopi cornfields in the 7 miles between First and Second mesa, and Hopi fields everywhere in the 14 or 15 mile distance from Keams Canyon to Hopi (1881), and we may surmise that First and Second Mesa Hopi were the owners, as these would have been the old lands of Awatovi and other Jeddito pueblos. Their methods of farming at this period are those of their ancestors:

> Wherever we looked we saw Moqui cornfields; these had been planted in every location promising the most nutriment in soil, protection from floods, or immunity from other dangers. The lives of these savage husbandmen seem to be constantly in peril on account of water, either from not having enough or from getting too much.

> The soil, very thin and sandy, is destitute of moisture at the top; the constant heat and the dryness of the atmosphere induce evaporation, but the under strata of clay and sandstone retain for a long time much of the rain

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or surface water which percolates down to them. Consequently our Hopi farmer buries his seed-grain deep in the ground. Taking his planting stick in his hand, he presses with his foot upon the horizontal bar and makes a hole from 12 to 18 inches in depth, into which he drops the kernels of corn.

The next greatest danger guarded against is that of floods. The ingenuity of the Moquis is equal to the demands upon it. They do not plant their corn in rows of a single stalk as we do, but in bunches, which effectually resist the sand-blasts of early summer and the full force of the debris sweeping freshets of the rainy season.

The appearance of a Moqui corn-field is therefore completely at variance with that of our broad acres of the golden cereal. In the Moqui fields, five, six, and seven stalks will be seen growing close together; another cluster of the same kind 10 feet off, and so on; each cluster almost surrounded at the foot by small branches, wisps of hay, little stones, piles of mud, and other injurious matter swept down by rain-currents.

The wind, the "cut worm," and the crow are other enemies the Moqui farmer has to fight from the moment the corn is dropped in the ground. When the tender leaflets of maize first peep above the surface, the fierce winds of May sweep down from the canons bearing on their bosoms clouds of sand and dust to overwhelm and destroy. In many of the more exposed situations it becomes necessary to build little ramparts of stone or clay on the windward side of the bunches, to keep them from being torn out by the roots.

The "cut worm" makes its appearance a little later, as the corn is attaining full size, and when the ears have become plump and tempting the dismal chatter of crows calls out the whole available boy strength of the Moqui nation to put to route the most persistent enemy of all.

Dismal scarecrows, made of the most leprous rags to be seen in this great republic, wave a transient defiance to callow fledglings. The older birds do not heed these phantom terrors, but proudly roost upon them, planning forays upon the luscious harvest, until the stealthy approach of two or three of their dreaded and sleepless foes - the small boys - scares them into a lazy flight.

The life of the Moqui small boy, viewed from the white man's standpoint, is not an enviable one during the weary weeks that the harvest is germinating and maturing, yet it would be incorrect to assert that it is altogether unhappy.

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> Every moment of the youngsters time is occupied in play-work, which, after all, is the true happiness of a healthy vigorous boy. He has enough to do to invest him with the consciousness of important responsibility without the irksome restraint of a set task to be accomplished by a fixed hour.
>
> Whole families move out from the villages during this season, and occupy dug-outs or other temporary shelters in the canons, or elsewhere, near their fields, to which unremitting care and attention are given. (Bourke, Op. cit., pp. 96-99.)

In connection with Bourke's report of "dug outs and other temporary shelters" as field houses used by the Hopi during some periods of the summer in 1881, Stephen mentions that "ugly iron-roofed cabins" had superceded native "rustic summer structures" for the Hopi by 1892 (Stephen, 1936, p. 951). Bourke's temporary shelters and Stephen's rustic summer structures were one or two room rectangular habitations of jacal or stone, known for archaeological as well as historic period pueblo sites throughout northern Arizona and New Mexico. Some of the New Mexico pueblos still use them today.

Whiting gives a list of plants cultivated by the Hopi (Whiting, 1939, pp. 12, 13) at various periods in their history:

> Since prehistoric times: corn, squash, kidney bean, tepary bean (no longer grown), cotton.
>
> Plants of doubtful origin, possibly introduced in pre-Spanish times: sunflower, gourd, lima bean, Aztec bean.
>
> Plants introduced by the Mormons: safflower, turban squash, sorghum, probably other fruits and vegetables.
>
> Plants introduced after the coming of the Spaniards: onion, chili peppers, watermelon, peaches, wheat.
>
> Plants of recent introduction: coxcomb, peanut, beet, cauliflower, cabbage, turnip, coriander, melon, cucumber, carrot, fennel (no longer grown), Jerusalem artichoke, lettuce, tomato, pea, radish, potato.
>
> Fruits: apple, almond, apricot, cherry, pear, grapes.

The general agricultural methods of these people are briefly described:

> The main corn crop is raised along the bottoms of the washes where flood waters provide a risky substitute for irrigation. Some corn fields are also planted under the cliffs along the edges of the valleys where underground seepage provides the necessary moisture in favorable years. The Hopi farmer thus has two chances of outwitting the weather. If the rains wash out the first crop he can fall back on the second, and when this fails in a dry year there is often enough flood water to insure a harvest from the first. At best, however, the harvest is insecure and the orthodox Hopi household maintains an extra year's supply of corn to provide against the inevitable year of complete failure.
>
> Beans, in contrast to corn, are usually planted in separate fields on top of the mesas, though occasionally they may be planted in separate rows in the same field with the corn. Squash, melons, gourds, etc., are grown in small plots in favorable localities close to the villages in a corner of the corn or bean fields. Peaches and other fruit trees huddle in gangling unpruned orchards in the sand dunes under the rocky cliffs.
>
> In addition to assisting the men in the fields, the women have sole charge of the tiny garden plots which they, or occasionally some luckless man, irrigate by hand from a pool near one of the springs. Here are raised chile and onions as well as a wide variety of garden vegetables.
>
> Some anthropologists would classify all American Indian agriculture as "horticulture" in as much as it does not involve the sharp distinction between the irrigated gardens, which are unquestionably horticulture, and the extensive fields of corn which might well be classed as agriculture, in the more limited sense.

Hough has given us a good description of the field methods as he saw them forty years ago. As the picture is not materially different today the following description is adapted from his account (Hough, 1918, pp. 236-237):

> Usually the corn fields are located in shallow sand dunes. These are cleared of brush in February. Planting begins in April and the harvest commences in September. Spring frosts and sand storms are drawbacks to the success of the crops, and sometimes floods injure the low-lying

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fields. The tools used are a planting stick usually made or ironwood or oak, usually with a wedge point, but sometimes having a blade. A hole is dug a foot or more deep and from 6 to 12 or more grains placed therein. These holes are gradually filled in as the plants develop. The hills are about 6 feet apart. The plant is small and rarely 5 feet high, the ears shooting near the ground.

The field is kept clear of weeds by means of hoes, usually the heavy homemade blade of Spanish pattern, sometimes of wood and anciently, according to tradition, of stone. The wooden trowel for tending plants appears to be a survival.

In the cornfields, scarecrows consisting of sheep scapulai, tin cans, etc., are set up.

For cleaning brush from the fields, a curious rake-fork is used. It consists of a three-tined branch of a juniper tree, peeled, and across the tines lashed a strengthening rod of wood.

Corn is gathered by removing the ears and transporting them back to the pueblo in wicker carrying baskets on the back or in blankets over the back or on the burro. Much of it is used in the green state during the roasting ear season. Husking pegs of bone or wood have been observed among the Hopi, but it is not known that this implement is ancient. The husked ears of corn are stored in the house in a place reserved for the purpose. Sorted by colors, it is stacked like cord wood. Occasionally it is taken out, sunned and brushed to free it from dust and insects. It is stored by crops, one year's being held over in case of failure due to a bad season. This custom is said to have arisen on account of famines, which so often plagued the Hopi in former years (Op cit., pp. 13-15).

Forde's description of ownership transfer, and inheritance patterns for First Mesa Hopi (Forde, 1931, pp. 366-383), largely obtained from Hopi-Tewa informants, closely follow those given by Colton for the Hopi as a whole. Colton illustrates the differentiation in native thought between different types of property: allotted house sites in the pueblo, common land lying just outside the pueblo, clan agricultural lands, and common grazing land outside the allotted agricultural land. The larger tribal land area is not mentioned as it would not be involved in those matters with which he is dealing.

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Houses are owned by the women and inherited through the female line. They can be sold. At Oraibi, if a person wishes to build a house the chief designates the site. At Shungopovi a person can build on any unused land so long as it does not block a thoroughfare.

Agricultural land, in dim antiquity, was allotted to the individual clans by the House Chief who founded the pueblo and as new clans joined the pueblo the acting House Chief allotted them lands from the common land. A member of a clan has the right to cultivate any suitable unused agricultural land of his wife's clan for his own clan. The land is assigned by the clan chief. The house chief and council have nothing to do with it. It can not be willed. At Shungopovi the right to agricultural land ceases four years after its last use.

The land outside of the clan allotments is held in common. Anyone has the right to graze as much stock as he can: Today under the Reservation System a man can select a piece of land, fence it for his own agricultural use. At his death it reverts to his children. It is his as long as he keeps it fenced, whether he cultivates it or not. There is a difference of opinion on this point. Within the clan, disputes over land are settled by the clan chiefs. Disputes between members of different clans over clan lands never occur, as they were settled long ago. Hopi traditions recount some cases of these early disputes between towns. However, sometimes disputes between towns occur over grazing questions. These are settled by the Agent.

There are no landless. Everyone has a right to his clan lands. If no land is available in his wife's clan a man can apply to his own clan chief for land. Common land not assigned to clans, although usually distant from the Pueblo, is always available but is subject to depredation by Navajos who will destroy his fences, drive stock across his fields and rob his house when he is absent.

Among the Hopi there is a clear distinction between real and personal property. Personal property can be bought, sold, and within the man or woman's clan can be willed. A man or woman can make gifts to any member of his own clan and expect no return. But if a gift is made to someone without the clan a return gift must be made of approximately equal value. Personal property at death passes down the female line. . . Certain classes of property can be willed. If a man wishes his children to inherit that property, he tells his wishes to two witnesses. These see that his desires are carried out. A man cannot will his cornfield nor a woman her garden by a spring for that is real estate. . . He can will his peach

orchard because the trees are personal property. He can will his cattle, sheep, horses, wagon, and his jewelry to his own children, grandchildren, and members of his or his wife's clan. (Colton, Op. cit., pp. 2, 3.)

Precisely how much area was farmed by the Hopi in the past it is difficult to say. Stephen gives an estimate of crops and area for 1893, which would be closer to their earlier production than any more recent data:

East Mesa----------1200 acres planted in corn

Middle Mesa--------- 800 acres planted in corn

Oraibi----------1600 acres planted in corn (only Third
3600 Mesa town at this date)

Yield at 12 bushels per acre of 43,560 sq. ft. (5 stalks in 1 hill, 8 ears in 1 hill, each hill 10 feet apart, ears average 3 ounces of corn) is 43,200 bushels or, at 56 lbs. per bushel, 2,419,200 lbs. Two thousand acres are planted in vegetables, beans, melons, squash, pumpkin, gourd, chili (capsicum), onion, celosia cockscomb. . . , sunflower, cotton, wheat, piba (eriogonum jamesii polygonaceae). One thousand acres in orchards, peaches, and apricots. (Stephen, 1936, pp. 954, 955.)

Page's two maps show the extent of Hopi fields today. (Page, Op. cit., Figs. 1, 2.) Hack gives two means of gauging the position of fields cultivated in the past. Sand dune fields may be identified by lines of stones used to hold down the wind breaks which outline them, but such fields make up only 20% (except at Hotevilla, where they make up over 60 percent) of those used today and always have been of less importance than the akchin or flood-water fields, which still produce the major portion of the corn crops. Location and size of flood-water fields used in earlier periods can be estimated only through knowledge of the history of local water courses, as such fields are planted where a "wash" ends and the run-off waters spread out over the surrounding area.

Sand dune fields are numerous on the tops and edges of the Hopi mesas today and undoubtedly were to be found in the same locations in the past, at least after the villagers moved to the mesa tops in the Spanish period. There is evidence, also, of former fields of this type along the north rim of the Jeddito Valley, especially on the wide bench half way up the cliff, and to a less extent near the cliff edge on top of the mesa. (See Hack's Fig. 48, locating numerous ancient sand dune fields as indicated by areas of stone lines in the Jeddito Valley.) His final comment on this type of field: "It is probably possible greatly to expand the area of this type of field all through the Hopi country, and in the Jeddito Valley sand dune fields may at times have been very important" (Hack, 1942, pp. 70, 71).

In the Jeddito today, almost all the fields are of the flood-water type, the only others of importance being those in Tallahogan Canyon, north of Awatobi ruin and eight miles from First Mesa, but still used by First and Second Mesa Hopi. These are spring-watered fields, and the people have built many small farm houses nearby, which they occupy during planting and harvest seasons. The Jeddito flood-water fields all are used by Navaho, except for one Hopi, married to a Navaho, who has his house and farm near the wash below Chakpahu ruin. The Jeddito ruins ceased to be occupied by the Hopi sometime before 1700 A.D., probably because of water shortage, and the people moved over to the Hopi Mesas, where the history of wash-cutting did not parallel that of the Jeddito (see discussion in Chap. III in this report; also Hack, Op. cit., p. 76), the Dinnebito, Oraibi, Polacca, and Wepo washes all providing good flood-water farm lands. Conditions in the Jeddito, however, still provided considerable areas for flood-water farming, as shown

by Hack (Maps 4 and 5, Fig. 53), and Hopis farmed these as individual holdings until they were lost to the Navaho. Fewkes in 1893 was told that Mishangnovi families still claimed Awatobi lands which had belonged to their relatives, former inhabitants of that abandoned pueblo. "The plain at the foot of the Awatobi mesa was reputed to be one of the gardens of Tusayan. . . (Fewkes, 1893, p. 369). Page explains this post-Ft. Sumner encroachment which led to loss of the Jeddito and Padilla Mesa areas:

> While the Oraibi revolt was gathering momentum in the middle 1800's, a new force was beginning to make itself felt on Hopi land use. This force was exerted by Navajos, who in increasing numbers were settling on the periphery of the region occupied by the Hopi.
>
> After the release from Fort Sumner, the Navajos were forced by new treaty obligations and increased pressure by white immigrants from the Rio Grande Valley to abandon to a large degree their old territory in the Mt. Taylor, Chaco Canyon region. This tended to push many members of the tribe westward even beyond the west boundary of the 1878 treaty reservation established by executive order. Droughts also attracted some groups to the Hopi country to trade for corn and melons. These groups settled in the Jeddito Valley and on Black Mesa, where water was available.
>
> Ute and Navajo raids for agricultural produce and slaves were not uncommon before 1879. At this time an agency was established at Keams Canyon and some measure of protection was given to the Hopi. Trading posts were founded at Keams Canyon, Polacca, and Oraibi after this date and the goods obtainable at these posts influenced Navajo families to settle around the Hopis. The juxtaposition of the two groups generated some friction over outlying agricultural lands.
>
> The individual holdings of the Hopis mentioned earlier were in some cases, along the Jeddito Wash and south of Oraibi near Padilla Mesa. These areas were settled by Navajos and permanent camps built. The Hopis and Tewas of the villages on First Mesa were directly involved in this settling of Lands in the southeastern portion of the Hopi use area. Inter-marriages between these two groups and Navajos occurred in this area, creating a colony in Talahogan Canyon, which is unique in the Hopi unit today.

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> This farming colony is made up of descendants of these inter-marriages, who use the springs in the canyon to water the terraced gardens built below the canyon rim and are constantly expanding the areas planted to corn.
>
> Other Navajo families have settled south of Talahogan Canyon in order to be near the flocks which they herd for Hopis of the First Mesa region. Small areas of agricultural land are used by these groups to furnish subsistence and in this manner new lands are being developed for dry farming along the Jeddito Wash (Op. cit., pp. 13-14).

An estimate of Hopi farms of the 19th century probably would cover approximately that shown in Page's map of Hopi land use before 1900, plus the Moencopi farm area not shown on his maps, Padilla Mesa south of Oraibi, Tallahogan Canyon, the area available for flood-water farms in the Jeddito, as shown in Hack's Map 5 (Fig. 53), and quite possibly some portion of the sand dune field areas around Antelope Mesa, though specific data on the latter, for this period, is lacking. Navaho raids, added to the scattering of Ute raids to which they were accustomed, made the Jeddito and Padilla mesa areas unsafe for Hopi farmers. When the Keams Canyon trading post was established about 1869, Navahos already crowded toward the west quickly pushed into the Jeddito. Other Navahos found the trading posts of Polacca and Oraibi convenient and began to occupy Padilla Mesa to the south and increase on Black Mesa to the north. The Hopi-employed Navaho herders settling in the Jeddito to be near their work (Navahos are mobile enough to have customarily followed this practice), planted fields near their hogans and thus acquired use-possession. The intermarriage mentioned indicates some break by individuals in the long repeated Hopi protests against Navaho trespass and acquisition of a considerable portion of Hopi lands. But Dozier, after going into some detail on Hopi friendship with Navahos but resentment of the Navaho as a group, realistically concludes:

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> Undoubtedly, unkind feelings toward the Navaho have been heightened by the reduction of the Hopi reservation to only about one-fourth of the area designated in the original executive order. Increase in landholdings for the Navaho was thus at the expense of the Hopi's and Hopi-Tewa's economic activities in horticulture and livestock (Dozier, Op. cit., p. 297).

There are 7130 acres of cropland in the Hopi jurisdiction today, of which 631,194 are semi-desert mainly used for dry and arroyo flood farming. By 1942, 110 acres had been brought under modern irrigation methods. 274 acres, in addition, are available to the Hopi at Moenkopi (Thompson, 1950, p. 42).

Sheep and Horses

Whiting, in discussing the adjustments in Hopi economics followed Spanish influence, remarks that the introduction of sheep was far more important in the total picture than the new plants introduced to their agricultural complex. The presence of sheep had both primary and secondary effects.

> Sheep soon displaced the antelope and other wild game. This led to the abandonment of hunting, the replacement of wild with domestic meat, and to a large extent of cotton with wool.
>
> Not only have sheep grazed off many of the plants which the Hopi formerly used more abundantly, but they have so over-grazed the land that the rains, unchecked by natural vegetation, have washed deep gullies in what where once flood water plains, occupied by extensive corn fields. The water table has been lowered and many once productive acres have been made unfit for agriculture.
>
> Sheep have had another vitally important, though indirect, effect upon Hopi life. During the period following the coming of the Spanish and the horse, Navajo and other nomads continuously raided the Hopi fields and villages (Bartlett, 1936), making their precarious existence even more hazardous. Eventually, the Navajo, under the persuasive influence of the United States Army, were forced to abandon raiding. Sheep have made it possible for these raiding nomads to adjust to a new way of life.

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> With their old enemies reduced to herders and haulers of wood the Hopi are slowly abandoning their high mesa villages and are gradually reoccupying land that they have not tilled for many generations (Whiting, 1939, p. 53).

Tietiev's line of thought is slightly different but not contradictory when he points out that "shrinkage of the game supply has been compensated in large measure by the increase of sheep raising activities among the Hopi" (Tietiev, 1944, p. 193).

Hopi sheep usually remain within a radius of ten to fifteen miles from each village and hence rarely get onto Navaho sheep ranges (Page, Op. cit. p. 9). The sheep, being tended by owners or their representatives, could be kept out of the cultivated areas and hence were permitted to graze near the villages. The first corrals were built on the benches immediately below the villages and the sheep were taken out in the early morning to graze and returned at night to be watered and penned. This arrangement permitted those who tended the sheep to continue living at home and hence being able to engage in village social life and ceremonies. As more owners acquired sheep and herds increased, good range decreased (the result of use and of the epicycle of erosion discussed in Chap. III), and the newer operators were forced to build corrals as far as twelve miles out on the distant ranges, which they reached by truck. Small shelters were built where some herders spend the nights during their turn at herding. But, as Page points out:

> The majority of the sheep men still prefer to stay in the village rather than live away. The Navajos surrounding the Hopi use area have taken advantage of this tendency on the part of the Hopi and have established range rights solidly around the Hopi unit.
>
> To obtain more range a few Hopis have tried to buy out Navajos living close to the villages, but the mass opinion of the Navajos is naturally against this practice (Page, Op. cit., p. 14).

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The Hopi of First Mesa (including the Hopi-Tewa) are more involved with sheep than are the other Hopi, among many of whom grazing is subsidiary to farming. Some of the First Mesa men spend much of their time in sheep camps (Thompson, 1944, p. 24). Other Hopis, especially from Hano, hire Navahos as herders. "The range used is usually the area which the Hopi established in the period when his lack of wealth did not allow him to assume the role of employer" (Page, Op. cit., pp. 14, 15).

Men of the other mesas usually pool their small flocks of sheep and goats and take two-day turns at herding the combined flock, especially in summer when the distant ranges are used (Beaglehold, 1937, pp. 49, 50).

Tietiev provides our most specific and concise account of the Hopi herding pattern.

> Within the last fifty years almost every adult male has managed to secure a small flock, and there is scarcely a household whose members are not partners in a herd. This does not mean that there is joint ownership, for, in fact, every sheep and lamb is assigned to a specific owner, but men keep their flocks together for convenience. In this way, one sheep corral, one spring or well, and one hut built near the grazing ground, suffice for all the partners. Unlike the Navaho, Hopi women and girls never tend the flocks, and even grown boys are only seldom asked to herd. This puts a heavy strain on the men, especially during the planting and harvest seasons, and it is felt that cooperation is absolutely essential if the sheep are not to be neglected. Accordingly partnerships are formed among brothers, between fathers and sons, or with other relatives, so that each man may divide his time between his flocks and his fields. The most common schedule of labor is to have a man herd for two or more days at a stretch and to spend the intervening nights at the sheep camp. He is then off duty while the other partners take their turns at herding, and it is not too difficult for all of them to adjust their farming programs to avoid a conflict with sheep herding duties. Men who keep their flocks at some distance from the village generally have a stock of provisions at their field houses and prepare their own meals, but those who quarter their sheep nearby usually take a lunch of piki bread and water with them and eat breakfast and supper at home. Only when the sheep shearing season arrives do the women accompany their husbands or brothers into the fields to keep house while the men are busied with their tasks.

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> Thanks to their intelligent and increasingly careful control of breeding, the Hopi have succeeded in greatly improving their sheep both as regards numbers and in respect to strain. In this way it has recently come about that a man's economic rating sometimes depends more on his flocks than on his possession of good farming land. A young man who sold his entire share of a herd, amounting to about 100 head, for 300 dollars in cash in 1933, was branded a fool by one and all, although the sum was a fortune even in the opinion of his severest critics. And when the U.S. Government, before inaugurating a program of erosion control, suggested that the Hopi and the Navaho sell off a portion of their flocks to relieve congestion on the over-grazed ranges, the howl of protest that went up from the agricultural Hopi was even greater than that which was raised by their Navaho neighbors.
>
> The high value imputed to sheep makes a Hopi hesitate long before he does any butchering. Rarely does he slaughter a sheep merely for the sake of adding fresh meat to his daily diet, but on special occasions he freely contributes as many head as are necessary (Tietiev, Op. cit., pp. 193, 194).

Horses and mules now are used for transportation, although burros formerly served this purpose and trucks now are replacing the horse or mule and wagon. The animals usually are owned within a family rather than by individuals, because of the expense and the labor involved in driving them out to pasture daily; buying fodder is too expensive to be practical. The pastures must be "at a considerable distance" from the village so that the horses may not disturb anyone's crops, and are hobbled so that they cannot wander too far. If used everyday, they must be driven out every night and rounded up next morning. Wild mustangs offer an enterprising young man a chance to acquire a horse, though their number was cut in the stock reduction programs (Tietiev, Op. cit., p. 194). The increase in use of wagons and trucks has minimized the use of burros in late years. In the past they were not kept in pastures, but wandered, hobbled, in the villages, seeking what little they might find to eat (Tietiev, Op. cit., p. 195).

The Hopi female is responsible for some of the gathering, for drying and putting away foods for winter use, for woodchopping, cooking, child care, plastering houses and kivas, making baskets and pottery, and participating in specific portions of ceremonial activities belonging to women.

The Hopi man does all the heavier portions of house-building, although the house will belong to a female, and in the past wove all the garments for daily and ritual use of his family, and made their moccasins. This, apart from his ceremonial duties, hunting, tanning skin, gathering, collecting salt, bringing wood, farming, and, after sheep were introduced, herding - kept him busy. In order to discover the proportion of time devoted by Hopi males to the various tasks in the economic sphere, Tietiev kept a daily work chart for five Hopi men over a period from Aug. 7 to Nov. 12 in 1933, summarized in the following chart (1937, p. 196):

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Name	Herding	Corn Fields	Bean Patches	Melon Patches	House Building	Wood Hauling	Horses 1*	Miscellaneous	No Work	Total of Days Noted
Luther 2*	0	10	3	9 1/2	9 1/2	1	0	14 1/2	3 1/2	51
Ling	49	10	1	6	8	7	1	7	9	98
Cecil	22	9	3 1/2	3	20	5	3 1/2	6	10	82
Alex 3*	17	14 1/2	0	3	0	1	9 1/2	3	35	83
Don	22	23	0	1 1/2	0	4	2 1/2	5 1/2	10 1/2	69
Totals	110	66 1/2	7 1/2	23	37 1/2	18	16 1/2	36	68	383

1* This does not include the routine care of horses.
2* Luther kept no sheep.
3* Alex was probably the laziest man in Oraibi.

Coal, Clay and Pigments

Coal, which occurs in small deposits on the edge of the Hopi mesas, is mined and largely substituted for firewood in winter when heavy snow and ice make wagon travel over distances almost impossible. Coal, as well as cedar bark and cedar wood, also is used in the firing of pottery (Beaglehold, 1937, p. 57), and deposits of coal ash and cinders at the pottery-firing locations on Antelope Mesa indicate that this extensive and unique use of coal was standard practice in P III and P IV before Awatobi and the other Jeddito pueblos were abandoned (Hack, 1942, pp. 7, 8, 12, 17, 18, Fig. 8). Just why coal came to be used is unknown. Hack suggests that it may have been easier to obtain than wood after the forest border was pushed back from the villages by cutting or by climatic change, or that obtaining the coal was easier than cutting wood with stone axes. Why use of coal was largely abandoned on Antelope Mesa during Spanish times likewise is unknown: the supply of coal easily obtainable by stripping may have run out, or the use of iron axes obtained from the Spaniards may have made it easier to cut wood than to obtain coal, especially after the ledges had been dangerously undercut by mining. On the Hopi mesas the supply of coal has remained adequate for winter use and pottery firing.

Some clay and pigments also are taken from within the Hopi home area though others are obtained from a distance, apparently a custom of very long standing. The pigments used in pottery decoration are black, yellow, and white. Mrs. Colton explains that the black is produced by boiling down Tansy mustard or the narrow leaf yucca. White clay, free of iron, is obtained from a broad vein in a wash near Coyote springs, southeast of the Hopi villages. Yellow and orange are made from yellow

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iron oxide, of which the best is taken from the banks of the Little Colorado. The gray clay for the pottery, which fires to orange is an oxidizing atmosphere, is found in layers beneath the Mesa Verde sandstone on which the villages are located. (Colton, Mary-Russel, F., 1938, pp. 7, 8, 10.)

This statement is somewhat generalized but checks with location of pigments given in more detailed studies pertaining to other uses. Smith, in his report on the mural paintings in kivas of Awatobi and Kawaika, gives identifications of pigments made by several specialists, and source of these pigments:

Yellow pigments: Goethite or limonite - "which occur locally in natural deposits," and from which salmon and orange are made by mixing with white. Brown is Goethite with impurities and iron oxide with impurities.

Red and vermillion, a variant, are of red iron oxide, hematite. Purple is manganese dioxide and red iron oxide.

Two blues were used, one being copper carbonate and the other a bluish gray mixture of carbonaceous material mixed with white.

Green, relatively rare, is malachite.

Black was made from various carbon materials, soot, burned bone, charcoal, etc.

White he found to be chiefly silicious matter or kaolin or both, part of this being the white sandy clay which occurs in the Cretaceous beds underlying Antelope Mesa. Some chalk, and some silica mixed with gypsum were used.

Gray was a mixture of black and white (Smith, 1952, pp. 22-25).

The pigments used in decorating the walls of the Franciscan church at Awatobi were the same as those used in the kivas except that in the mission all the black was charcoal and all the blue and green came from copper

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carbonate. (Montgomery, Smith, and Brew, 1949, p. 295; Smith, 1952, pp. 24-25.) The same substances are used by the Hopi today, sometimes with the addition of plant materials: ground-up sunflower petals, yellow pollen, dried flowers of Bigelovia graveolens, corn smut (fungus), carbonized corn cobs, purple corn kernels, sumac berries. Certain mineral substances not distinguished in the pigments found at Awatobi also are used by modern Hopi (and doubtless by their ancestors); coal, lignite, shale, oxide of manganese, black clay and black stone from the mountains (Smith, 1952, pp. 25-27.)

Fewkes found a few pigments in the Awatobi graves he excavated: green copper carbonate, yeellow ochre, sesquioxide of iron, and micaceaus hematite. (Fewkes, 1898, pp. 617, 618.)

Alexander Stephen's long sojourn close to the First Mesa and intimate association with Hopi ceremonial and daily life (backed by obvious education and stimulated by cooperation with the anthropologist J. Walter Fewkes), procuded a series of detailed notebooks, since edited by Parsons, in which we find pigments mentioned time and again (Stephen, 1936, pp. 55, 232, 271, 332, 411, 412, 470, 510, 737, 878, 1194, 1195). In only a few instances does he note the localities from which the pigments are obtained, but these bring the picture into clear focus.

"Red earthy ochre" is found in some of the low hills in the south, near Shushtuban tukwi, 15 to 20 miles from Walpi, southwest of Kaibito, and in the foothills near ruins called Kau ta ktipu (Corn Burned Ruin) in the foothills in West Valley (west of First Mesa). (Stephen, 1936, p. 1195.)

The "salty" or "potato clay" used by the Hopi in flavoring their dish of wild potatoes and in mixing red paint is obtained by the Hopi in seams near Mishongnovi and at Hochokoba spring in the East valley, north of Sikyatki. (Ibid., p. 233.)

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"Specular iron, which is obtained near some mining town which they say is called Pinala (they have no Hopi name for it) somewhere north of and not far from San Carlos. There is no flowing water there." (Ibid., p. 1195.) The Pinal mountains, which might have been the basis for their place name, are about 35 miles west of San Carlos; the Nantuck mountains are north of San Carlos, but the entire region may have been known to the Hopi by the name of the larger mountains. A trade route running from the Hopi to the occupied desert areas of southern Arizona crossed this district. Parsons simply translates the Stephen description into "San Carlos mountain."

Some yellow is made from alunogen and from a "whitish arenaceous gysiferous deposit; these are obtained in the mesa cliffs in this region" (Op. cit., pp. 271, 898). A better grade of yellow comes from a spring in one of the branches of the Grand Canyon, east of Cataract Canyon. Grass, wood, and clay from this immediate area also are obtained to be used in certain kiva ceremonies. (Op. cit., pp. 558, 638, 668.)

Copper ore pigment is "carbonate of copper (fragments of which ore they gather on the Ko'honino plateau)" (Op. cit., p. 470).

White clay is brought from a spring at Kushyuba, a shrine on Black Mountain, 30 miles northwest of Walpi for use in making prayer sticks (Op. cit., p. 417). Another type of white clay, used in whitening all katcina, because it smells sweet, comes from Tuma, just beyond Hukyatuwi in the eastern range (Op. cit., Footnote 5, p. 25; Maps 8, 9). Still another site for obtaining white clay is Crow Spring on the west side of First Mesa; this clay is used in whitewashing house walls. (Ibid.) White clay (type unstated) is applied to all katcina dolls as an undercoat, before the bright colors are added (Colton, 1959, p. 9).

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Beaglehole reports that yellow and copper carbonate had to be obtained at the Colorado River, and that supplies often were obtained there when the Hopi went to collect salt. An old copper mine half way below the rim at Grandview Point, some miles west of Grand Canyon township produced ore which could be ground to make a fine blue paint. Prayer feathers are left at shrines close to the foot of the San Francisco peaks, passed on this journey, and in the mine. White clay was obtained from a bed on the Winslow road (specific location not given by Beaglehole but Hough places it 12 miles southeast of Walpi: Hough, 1916, p. 77) this was used in pottery decoration (Beaglehole, 1937, pp. 55-56).

Parsons (1939, pp. 274-275), lists Hopi pigments as malachite, yellow or brown ochre, carbon, or shale for black, kaolin for white, specular iron or iron stained sandstone, and red hematite. She gives no locations. Colton (1959, p. 10) gives body and katcina doll paints as red and yellow iron oxide, kaolin, malachite and corn smut soot, without location.

Hough was interested in Hopi pigments and their sources in 1902. Smith comments: "Hough characterized the Hopi as 'assiduous collectors' and added that their pigments and dyes, when compared with those employed by other American Indian tribes are remarkable for their number as well as for their diversity of origin. I believe, however, that this statement would apply with equal accuracy to all the Pueblo groups." (Smith, 1952, p. 25.) In Hough's 1902 paper one finds the various colors and materials used for those colors much as given by Smith. Recipes for mixing some of the paints are included, such as combining powdered blue and green copper carbonate with boiled and strained pinon gum, to make blue or green paint, and pouring the liquid from boiled purple corn kernels onto dried sumac berries and

adding the "potato clay" to form light red, but the only location given for collecting pigments was Cararact Canyon, 110 miles west of the Hopi reservation, where both the copper carbonate and hematite were obtained (Hough, 1902, pp. 469, 470). In his 1915 volume he mentions red clay from Sikyatki used in pottery decoration (Hough, 1915, p. 77), and brown "from a distant mesa" (Op cit., p. 81).

In his discussion of Hopi moccasin making, Hough describes dyes for buckskin, "a warm brown . . . given to the leather with an infusion of the bark of the water birch, and a black dye . . . made by burning pinon resin with crude native alum" (Hough, 1915, p. 73).

To summarize, coal, pottery clay, "salty clay," soot, tansy mustard, and yucca for paint, and some white and some yellow iron oxide come from the Hopi "home area"; other white clay, the good yellow iron oxide, copper carbonate, red clay, specular iron, and wood come from a distance.

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EXTENSIONS OF LAND USE: INNER TO OUTER AREA

Animals and Birds Utilized

Hunting: In 1898 Hough stated that the Hopi were "practically vegetarians," although they occasionally ate rabbit, prairie dog, rat, a sheep or goat of their own, meat purchased from a Navaho, and even, on occasion, a burro (Hough, 1898, p. 141). But in 1919 he discussed Hopi hunting as it was when the range of many animals may have been extensive, where now it is restricted because of the reduction of grass and other herbage because of overgrazing and the epicycle of erosion which chanced to come at the same period.

> The antelope was, as we know, plentiful in all portions of the open country, and probably deer of several species ranged with them. Bear also had a more extensive range on account of food, there being evidence that juniper forests were much more widespread than at present. Smaller animals, like the fox, coyote, wolf, skunk, racoon, porcupine, badger, prairie dog, rabbit, hare, mice, etc, may or may not have been more prevalent. Birds, are still numerous; reptiles and insects are yet in sufficient quantity.
>
> The above is a summary of the animal resources, near and far, which were available to the Hopi and use was made of all of them (Hough, 1919, pp. 284, 285.)

Tietiev found that the Hopi were very fond of meat and emphasis on hunting in both ritual and legend: "It appears likely stage of their cultural development the Hopi were far more depende as a food supply than they are at present" (Tietiev, 1944, p. 188). plants, salt, sugar, chili, onions, and garden vegetables are classi gether by the Hopi under a term "Uh: ngala" (Watson, 1954, pp. 20-21 These were the items which were more difficult to obtain than the stap their diet, corn, beans, and squash. They were those which added flavo

variety and were hence much valued. Meals for which meat is the main dish may be served for guests or on occasions of fiestas; otherwise meat is used in smaller quantities, as a flavoring element and to add variety. Their method of preserving meat was by drying it in strips which later could be used in stews, etc. Fish were avoided by the Hopi and Zuni on the basis of legendary tabu; the Apache and Navaho fish avoidance beliefs undoubtedly were borrowed, as the norther Athabascans use fish as a major staple in their diet.

The Hopi is fond of hunting, the opportunity to display skill and daring (a contrast to the demanding but unexciting duties of the agriculturist), as well as to bring home animals of which the meat, hides, sinews, etc., could be used providing thorough personal satisfaction. Rabbits and other small game, coyotes, eagles, and some other birds, and turtles, are hunted today, but in the past - within the memory of living persons - when meat was otherwise unobtainable and pasturage grass adequate to support more wild animals, the Hopi hunted antelope, deer, mountain lion, mountain sheep, and the gray wolf (Beaglehole, 1937, p. 49; Thompson, 1944, p. 24). Fewkes pointed out, in 1890, that the supply of rabbits, deer, and other game was so small that almost every animal of mammalian form was eaten at times (Fewkes in Parsons, 1922, p.271). Chickens were unknown to Hopi at that time. The white man's domestic turkey and the razor back pig were not introduced until 1892 (Op. cit., p. 272).

Hopi hunting falls into two categories, that for economic use and that necessary to provide ceremonial items. The two cannot be strictly separated, but in general one thinks of the mountain lion, wolf, coyote, bear, birds, and turtles as of ceremonial importance only. In a culture where

ceremonialism is as developed as among the Hopi, such items are constantly required, and this type of hunting continues to a large extent even today.

Birds: The eagle was the most sacred of birds to all the Pueblos; he was a symbol of the sun and his downy plumes were thought to carry prayers to the supernaturals. The Hopi capture eagles, to gring to the village and there they are caged or tied so that their feathers may be used in making prayer plume offerings.

> The buttes on which eagle nests are to be found are owned by the various clans in each village and under no circumstances do members of one clan trespass on the buttes owned by another group. The buttes are situated in the country surrounding the mesas and may be forty miles or more away from the village. Clan ownership rights are established by legendary accounts of clan migrations which usually relate, along with other incidents, how the clan in question came to possess particular buttes. Unfortunately, the Navaho are unable to appreciate the Hopi viewpoint on this matter, and their rival claim to control of certain buttes is at present the source of much petty quarreling, and was probably in former times a potent cause for intertribal warfare (Beaglehole, 1936, p. 18).

Hough gives the location and owners of the various nest areas: ". . . the Snake Clan claims the eagle nests near their old village of Takorabi to the north of Walpi; the Horn Clan those to the northeast; the Firewood Clan those at the upper end of Keam's Canyon; the Bear Clan those at the mouth of the same canyon; the Tobacco Clan those on the crags of Awatobi; the Rain Cloud Clan the nests in the Moki Buttes; the Reed Clan those in the region of their old town forty miles north of Navajo Springs on the Santa Fe railroad; the Lizard Clan the nests on Bitakuchi or Red Rocks, about forty miles south of Walpi; or that the eagle nests west of the pueblos along the Little Colorado and Great Colorado belong to the Oraibi and Middle Mesa villagers. He (the Navaho) would disdain the fact that one cannot meddle with eagles within forty or fifty miles of the Hopi towns without trespassing on property rights" (Hough, 1915, p. 169).

Stephens (1936, pp. 568, 569) gives a partial list of these same locations. Katherine Bartlett (Museum of Northern Arizona; Personal Communication, April 1960) notes that the Lizard clan nests at Red Rocks (Monument Point on road from Leup to Oraibi) still are utilized. Other nests still visited by the Hopi are the famous nest at Wupatki, and nests at Tolchaco, about 12 miles northwest of Leup, 2 or 3 miles above Grand Falls, and nests in Chevlon Canyon and 5 or 10 miles south of that canyon.

Hough explains the basis for this ownership pattern, according to Hopi thought: "The curious fact comes out that these eagle preserves are near the place of ancient occupancy of the clans and show in a most interesting way the lines of migration by which the several clans traveled to the villages where they now live. These rights are jealously guarded by the Hopi and are one of the sore spots in their relations with the Navaho; they frequently ask to have the government define their eagle reservations by survey to establish the boundaries free from molestation" (Op. cit., pp. 169, 170).

Fewkes' discussion of the Hopi concept of proprietary rights with reference to the eagle greatly clarifies understanding of a custom which seems as natural to the tribe as it is novel to us:

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A Hopi speaks of his eaglets and eagle-nests as he does of his sheep or horses, regarding them as clan property. He takes no care of them; but when he wishes their feathers, he plucks them from birds which he owns and from no others. This recognition that certain wild birds belong to one clan, and others to another, has not, so far as I am aware, been specially commented on by writers on zooculture among the Indians. . . When, as at Zuni, eagles are brought to the pueblo and kept alive from year to year, there exists an advancement beyond the Hopi custom of merely capturing the feral birds from the nests of their owners. [Others have stated that the Hopi, also, kept live birds in the pueblo.] Anyone in Tusayan who kills an eagle, not his own, within about fifty miles of Walpi, trespasses on the property-rights of others. In other words, the eagle, although wild, is regarded, from the point of view of ownership, in the same way as is the horse, cow, or sheep,--eagles are property over which the Hopi have rights which all their number respect. Unfortunately, however, this right is often violated by white men or by the Navaho, who see no reason why wild birds should belong to a person living perhaps forty or fifty miles away. There are no other wild creatures which the Hopi now regard in the same light of ownership that they do the eagle.

As already suggested, proprietary rights with reference to the eagle inhere in the clan rather than in the individual;

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nests, eaglets, and adult eagles are owned by the whole clan, not by any one member, although the male head or chief of that clan represents its rights; he speaks of them as his property, and has inherited the right to do so through his mother. This is an ancient form of ownership which prevails likewise in the case of land, springs, peach-trees, houses, and other possessions. Some clans are poor, and own no eagles; but among the "wealthy," two members of the same clan may have nests in different localities. As a rule, however, the nests of eagles near village ruins are owned by the descendants of clans which once lived in their neighborhood.

. . . In their early migrations from distant pueblos to their ultimate homes, each clan halted at intervals, where towns were built but were afterward deserted. The sites of these abandoned villages are indicated by ruins which are very numerous in Arizona and also in parts of New Mexico. Thus it resulted that men of certain clans claim rights in springs near ruins in which their forefathers lived, and at times of ceremony they revisit these ancestral springs to obtain water which is considered particularly efficacious in the performance of ancient rites; thus, also, certain tracts of land are regarded as the property of this or that clan. The present ownership of eagle-nests in the vicinity is a survival of a similar claim.

. . . One of the oldest, if not the most ancient of all the Walpi clans, is the Snake, which formerly lived at a place called Tokonabi, near Navaho mountain, far north of the Hopi mesas.

. . . The eagle nests of the Snake clan are situated a few miles north of Walpi, not far from one of the abandoned Snake pueblos; they claim others north of this which, however, they never visit. In most ancient times this clan doubtless had eagle-nests at Tokonabi, but as it drifted southward and the country which they left became occupied by hostiles, visits to these nests were gradually dispensed with. Those which they still claim are near their last settlement, but visits to them became more or less dangerous after the hostile Ute raided the Hopi farms not many years ago.

The Horn (Ala clan owns the eagle-nests about Wakash (Span. Vaca, Cow) spring, northeast of Walpi. Their eagle claim is contiguous to that of the Snake clan, as would naturally be expected from the fact that these two clans once lived together at Tokonabi.

. . . The Firewood clans came from the east, probably not far from the pueblo of Jemez, and during their early migration lived for some time in Keam's canon, not far

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from Keam's trading post, where the ruin of their settlement may still be seen. This clan claims as its property all eagle-nests in the upper end of the canon named, near the school and their former pueblo.

. . . Little can be learned concerning the route of migration of the Bear clan westward from the Rio Grande valley, but it is said to have passed through Keam's canon to Turkinobi, a now-ruined pueblo not far from Sikyatki. The Kokyan, or Spider clan, one of the group of Bear clans, claims the cliffs at the entrance of Keam's canon as its eagle preserves.

. . . the Rain-cloud (Patki) clan formerly lived at Palatkwabi, but migrated northward to Homolobi, near Winslow. Abandoning this town, they went farther northward, building a pueblo not far from the Moki buttes. When they left this habitation, the ruins of which are still traceable, they continued their course to the Walpi wash and erected homes at Pakachomo, in the plain about three miles from Walpi, where the remains of house-walls are still pointed out. From Pakachomo the clan went to Old Walpi by invitation of the chief of the latter pueblo. Anawita, the head-man of that clan, claims as his property all eagle-nests in the Moki buttes as far east as the Holbrook road. The eagle property of the Kukutc (Lizard) clan begins at Bitahutci on the same road, and extends eastward to the ruin of Kintiel, twenty-five miles north of the railroad.

The Pakab (Reed) clan lived at Awatobi until its destruction, but before they reached that place they inhabited a pueblo called Kwavunapi, about forty miles north of Navaho station on the Santa Fe railroad. . . Pautiwa, chief of this clan, claims all the eagle-nests near Kwavunapi and the region south of that ruin.

The Kukutc (Lizard) clan, which, like the Patki, originally came from the far south and had settlements at one time on the Little Colorado at or near Homolobi, owns the eagle-nests east of the Holbrook road around Bitahutci, or Red Rocks, about forty miles from Walpi.

The eagle-nests near Kicyuba, north of Walpi, a sacred spring of the Katcina clan, are owned by Supela, of the Patki clan. This clan never lived in that region, hence there is no way of accounting for Supela's claim except that he inherited it from Oraibi relatives.

The eagle-nests west and northwest of the East Mesa, along the lower part of the Little Colorado (Pala-baiya), and portions of the Great Colorado (Pisis-baiya), belong to clans of Oraibi and the Middle Mesa pueblos, hence the

> Walpians lay no claim to them. I have not studied the clans of the latter villages, but there is evidently good reason for their claim, judging from the composition of the clans in these pueblos. Probably many of their ancient clans came from the numerous houses, now in ruins, within the drainage of Rio Colorado. . . .
>
> The clans of the Tewa pueblo of Hano have no eagle-nest property near their pueblo. This can readily be explained by the fact that they were late arrivals in Tusayan, consequently all available nests had been pre-empted by existing Hopi clans.
>
> It thus appears that the present claims to ownership of eagle-nests are based mainly on the situation near former places of residence. This fact can hardly be regarded as a mere coincidence, nor do the Hopi consider it as such; indeed, they regard their proprietorship as proof that the country in which eagle-nests are situated is theirs, and have repeatedly urged me to so inform those engaged in surveying the boundaries of their reservation (Fewkes, 1900, pp. 693-700).

Fewkes goes on to describe the catching of eagles by men hidden in circular structures like short towers, on top of which is tied a piece of meat to lure the eagle to where the hidden man may clutch his leg. Such hunting, like that for antelope (some time since almost dropped in the Hopi area, says Fewkes, because of disappearance of antelope), and of rabbits, was accompanied by ceremonial rites beforehand (Op. cit., p. 702). The eagle "prayer stick" is the ovoid representation of the eagle egg, in wood painted with spots, deposited in several shrines. The best known is that near the old ruin of Turkinobi on East Mesa not far from the two pyramidal mounds above Sikyatki (Op. cit., p. 703).

Near the school of Dawapa (Sun Spring) below Walpi, is the eagle egg shrine where "eggs," stone and wood have been placed with prayers for increase of eagles. In the modern period, images of domestic animals are placed here for the same purpose (Op. cit., pp. 171-172, 175).

The birds are thought to be children of the clan because they come from clan-owned buttes; they are "dead Hopi who have returned to the village disguised as eagles." Capturing them today is commonly accomplished by taking eaglets from the nests - whose down is much needed in ceremonies - a feat requiring some daring in fending off the adult birds as well as in climbing to the nests. This system is used also at Zuni, Santo Domingo, Zia, Santa Ana, San Felipe, and Cochite pueblos, and by the Comanche, Havasupai, and some California tribes, and as far north as Thompson River. In contrast, the Navaho, the Unitah Utes, Jemez, and Taos, and tribes to the north and east on the Plains, use the pit trapping technique for eagle catching -- and this is the method used by the Hopi in the past, and to some extent today. A man hides in a circular tower build upon a high place. Upon the top, a frame of rods lashed together, is tied a rabbit. When - eventually - an eagle swoops down for the rabbit, the hunter reaches out and grasps the bird by the legs, something of a feat (Hough, 1918, p. 286; Fewkes, 1900, p. 700 701; Hough, 1915, pp. 170, 171). "At each (Hopi) hunt one eagle was liberated after a prayer stick had been tied to his thigh in the belief that the bird would carry the prayer to the mighty beings with whom he was supposed to be on familiar terms" (Hough, 1915, pp. 170, 171). The captured birds are tethered to a beam or are caged on top of the house in which the hunt leader or the clan mother lives. Clanswomen or the hunter wash the head of each eagle with gypsum and ceremonially name it with an appropriate clan name. (Washing the head always is involved in the ceremony of Hopi naming rites.) The bird is fed well on crushed meat each morning to make its feathers large and glossy. It is plucked and killed on the tenth day of the Niman ceremonies by pressure on its chest, without loss of blood, and the body is deposited in the eagle cemetery in a crevice of the mesa, with a few rocks placed above

the body (Beaglehole, 1936, pp. 20, 21, 24, 25). Eagle wing bones are made into whistles used in ceremonies to dedicate medicine and to imitate bird calls (Hough, 1918, pp. 295, 296). The albumen from eagle eggs was mixed with dry ground coloring matter for painting masks and other ceremonial items, a very important matter to these people. Eggs were not eaten (Fewkes in Parsons, 1922, p. 272).

Other birds, the feathers of which are needed, are taken in traps or snares so that no blood is shed (a taboo for use of creatures to be used in religious observances) and so that their plumage will be perfect. A series of nooses secured at intervals along slender rods are planted near springs where birds congregate and seeds are scattered. The birds become entangled in the nooses while feeding (Hough, 1918, p. 285). The constant demand for feathers of many different birds for ceremonial use necessitates much effort and skill in maintaining the supply (Hough, 1918, p. 286). Hawks' feathers formerly were used in feathering arrows (Op. cit., p. 288), and to obtain their feathers hawks were kept in captivity part of the year (Simmons, 1942, p. 12).

Birds mentioned as commonly needed for their feathers are the red flicker, yellow warbler, hawk, owl, turkey, and road runner (Nequatewa, 1946, pp. 15-16).

The turkey is sacred to the Hopi and its feathers must be included in all prayer offerings because, traditionally, this bird is associated with water. Turkeys were domesticated in prehistoric times and kept principally for their feathers, used ceremonially or in making feather blankets. They still are kept in the villages for the same purpose (Hough, 1915, p. 172; 1918, p. 286).

Parrot feathers are important for some katcina equipment. These birds once ranged as far north as Oak Creek, just south of Flagstaff (Hammond and Rey, 1929, p. 183), and have been reported from Sycamore Canyon, near Flagstaff, but apparently were killed off about 1900. Mexico is considered to have been a more common source for parrot and macaw feathers, by way of the trade routes (Dockstader, 1954, p. 111; Brand, 1938, pp. 3-10). Dyed feathers have in part replaced some of the old colored plumes so difficult to obtain today.

Turtles: Turtle shells are used as rattles by most or all of the katcina dancers, and small boys frequently receive such shells from the Katcinas on the days when they appear with gifts for the children, occasions which to some extent parallel Christmas. The turtles are obtained from a tributary of the Little Colorado River near Winslow, now dammed to form a water supply for that city. Prayer sticks are placed on a shrine in a narrow rock crevice with prayers for rain and for success of the turtle hunt (Beaglehole, 1936, p. 22). Fewkes described the Hopi gathering turtles at Homolovi (a ruin in the area above described by Beaglehole) in 1896:

> While we were at work on our excavations at Homolovi a small party of Hopi made a visit to the Chevlon and Clear Creeks to collect turtles for use in the sacred dance. They also made prayer offerings, which they placed in shrines, and carried back water for use in a katchina dance, the Calako (Sio,Zuni) which was performed in July at Sitcomovi (Sishomovi). These men made a pilgrimage of 80 miles to visit ancestral places of worship. The fact has a significance and is connected with early migration of cults. (Fewkes, 1896, p. 525,)

Hough mentions Clear Creek, near Winslow, as one of the streams from which holy water is brought to the Hopi villages (Hough, 1915, p. 177).

Large Game: The Hopi prefer to follow the larger game on foot (see Stephens, 1936, p. 277) but do use horses, as well, today.

There are ritual preparations for the hunt, and after the game has been brought home and the meat removed, the bones are cleaned and each bone marked along its length with a streak of red ochre. The eye sockets, jaws, and nose of the skull are similarly marked. Next day before sunrise, the bones are sprinkled with sacred meal and placed on a shrine close to the village with prayers for increase of the animal.

The use of an animal shute or pound in an antelope or deer drive is given by Beaglehole (Op. cit., p. 8) as a Navaho method of hunting, though occasionally used by First Mesa Hopi, who had learned it from the Navaho. Stephen, who knew the First Mesa Hopi very well from 1881 to 1894, believed this to be of Hopi background (at least not borrowed from the Navaho). (Stephen, 1936, p. 149.) He describes two types of Hopi hunts.

Hough states that the Hopi used the shute and drive method in ancient times and that its use later increased when these people acquired the horse and the metal axe (Hough, 1919, p. 285).

More commonly, however, the Hopi relied on surprise, speed, the bow and arrow, the throwing club (rabbit stick) and encircling the game (Hough, 1915, p. 173). Stephen, who knew the Hopi very well between 1881 and 1894, gives a description of both methods of hunting:

> Ma'kabono, the old style of hunting afoot when all the men of the village took part. They divided in two long deployed lines surrounding a wide scope of country and gradually converging. This method was employed as against deer, antelope, and rabbits.
>
> They also formerly made long tinchels or fences for the capture of antelope. The whole structure was very extensive and was called antelope house (chubki). A suitable

large mesa nook or other practical site was chosen and of an area say 600 feet by 300 feet. This was enclosed with a strong high stockade of tree boles and limbs, close, compact, and slightly overhanging inward, to prevent the antelope from jumping out. This stockade structure was usually in the form of an ellipse and at one end was left open, fifteen or twenty feet wide. This elliptic construction was called sheep house (kane'lkiadta).

From each side of this opening a brush fence, limbs in foliate piled close together, was built, gradually diverging in width as it extended from the sheep house. These two fences were called its wings (masha'adta) and were carried along for a good distance, 800 to 1000 yards. Beyond this distance, also gradually diverging, were laid piles of brush at short intervals and boughs and limbs were set in the ground here and there, and this open structure was extended several miles, ten or twelve or even more, usually, however, not more than four or five miles long.

A person spying a band of antelope grazing in the region of an antelope house would be careful not to alarm them, but hastening to the village would tell what he had seen. Eight young lads were then sent toward the antelope, the other villagers hastening to the antelope house. The eight approaching the band would seek for cover, striving to arrange so that four would crawl down an arroyo on either side of the band, deploying so as to leave three on either flank at a distance apart from one another, and the two in advance of the two lines having passed the antelope would approach each other, thus surrounding the band on three sides. All were provided with cedar bark and the fire-making board (pilanko), and the two at the far end of the antelope would start two smokes and imitate the cry of the wolf, starting the antelope from them. As soon as the antelope approached the other youths, they in turn started each a smoke and, yelping like wolves, tried to head the antelope in the direction of the wide spread antelope house wings. A few men were stationed at intervals far apart on the outside of the wings and kept the antelope in the desired course. The antelope running through the stockade, two men who had been stationed at the gate with piles of heavy brush wood, all ready, would instantly close the gate. The chief of the hunt and the other men were stationed outside the stockade and shot the antelope down. Of course they were not always successful. Some men with bad hearts might be at the stockade, or the Hunt chief may have been remiss in some of the hunt ceremonials. Then the antelope would refuse to go near the "house" or approaching it, if they smelled those evil persons, they would break away (Stephen, 1936, pp. 287, 279.)

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Stephen described one of these "pounds," which he saw in 1893, on First Mesa:

> The wall built long ago across the narrow mesa neck southwest from Kiku chmo (on the mesa top two miles north of Tewa) was a hunt corral. Before the Navajo came to this region, or before they were numerous, game, especially antelope, were in abundance. A hunt being organized, antelope were driven down the mesa toward this wall in which was a wide gateway. After they had passed through, this was closed with pinon and juniper boughs and the whole length of the wall was stockaded with these boughs. The younger lads remained outside of the wall shaking their blankets to scare the game away from jumping the wall.
>
> The grown men went inside the wall and shot the game down or in the melee caused the antelope to leap over the cliffs and break their legs and necks. This same version was told me many years ago (Stephen, 1936, p. 149).

Capt. John G. Bourke, who saw much of the Indian country of Arizona and New Mexico in the 80's, described a similar antelope shute in Navaho country farther to the east. Later he called attention to a shute between Keams Canyon and the Hopi mesas, used by both tribes (a point which casts doubt on antelope shutes or corrals serving as indication of Navaho - or Hopi - exclusive occupation of an area):

> We saw another antelope corral similar to that already described; this was used by both Navahoes and Moquis, whose territorial possessions overlap in this vicinity (Bourke, 1884, p. 84).

The Hopi used buckskin for shirts, leggings, breech-clouts, bags, parts of masks, etc., some of this material being the product of their hunting and some obtained by trade with the Havasupai and others. Sinew, horn, and bone also found use in production of household articles (Dockstader, 1954, pp. 78, 108, 109, 112, 115, 119; Hough, 1919, pp. 242-245, 251; Fewkes in Parsons, 1922, p. 254, etc.).

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Mountain sheep were killed on occasion in the Grand Canyon area; their horns were pierced to serve as "wrenches" for straightening arrow shafts, for dippers, etc. (Hough, 1919, Pl. 46).

Small Game: The place of the antelope, once a favored animal with hunters but now scarce, has been taken largely by the rabbit. Rabbit hunting is done by the first method described by Stephen, in which two groups of men each start out in a wide circuit heading in opposite directions until it is felt they are far enough apart, when, at a signal, they approach each other, cross, and form a smaller loop. Repeating this, they cut the size of the circle within which the surrounded rabbits are enclosed. When the circle is small, the rabbits are killed by the boomerang-like rabbit sticks being thrown at them or by being clubbed with straight sticks (Tietiev, 1944, p. 188; Hough, 1918, p. 286). Coyotes were sometimes taken in the same fashion, though they, the fox, and other mammals usually were trapped by use of the deadfall (Tietiev, 1944, pp. 191-193; Hough, 1918, p. 286). Deer and antelope were hunted from horseback in a drive of similar type, but when pursued animals broke from the group, each man singled out an animal and went after it alone (Tietiev, Op.cit., p. 191).

The throwing club (rabbit stick) was thrown at rabbits and other small game to knock them off their feet, after which they were struck on the head. Prairie dogs sometimes were driven from their holes during rain storms by digging a small trench which directed the run-off into their holes (Hough, 1918, p. 285).

A more unusual method of taking rabbits involved digging a trench about three feet wide and from six to eight feet long and two deep,

on a rabbit trail. After the debris had been removed to some distance, a net was stretched over the trench and fastened at the side with pegs. Grass or other vegetation was spread thinly over the net to conceal it. The jackrabbit who jumps onto this net finds himself unable to hop off and so can be killed by the hunter (Nequatewa, 1946, p. 62).

In winter, men ran down rabbits in the snow, a good runner taking three or four jackrabbits in a day (Ibid.).

Cattle Raising: Hopi cattle, obtained - like the sheep - through the Spaniards, never have been as popular with them as sheep because of initial expense of the stock and the problem of their breaking into fields, destroying growing crops, and thereby causing trouble among the villagers (Tietiev, op cit., p. 194). Cattle did not become important in the Hopi area until the 19th century. In the late 1800's four Hopi owned large herds and established ranges and herding camps as far from the villages as Shonto Springs, Tolani Lakes, Ganado, and the Hopi Buttes, localities now deep within the regions used and thickly settled by Navahos. The Hopi do not attempt to herd their cattle, even today, but leave them roaming the range. If they drift onto Navaho sheep ranges or onto Navaho corn fields (Page, 1954, p. 9), the Hopi are not embarrassed because they consider the Navaho as recent invaders on their own ancestral lands.

Collecting and Gathering of Native Products

The Hopi, as Pueblos, are thought of as sedentary people, as indeed they are. But they are accustomed to moving with alacrity and to run when long distances are to be covered. This trait, sometimes not realized by outsiders, is brought to attention in the tale of a Hopi runner who - before transportation, phones, etc., were available between

the villages and the outer world - left Oraibi with a note at 4 P.M. one afternoon and arrived in Winslow, 65 miles south, during the night. Next afternoon he returned to Oraibi with an answer to the note, a round trip of 130 miles, - and this Indian was not the best runner in Oraibi. Hough referred to one in that village who customarily took a morning practice run of 30 miles or so to get himself in trim for the dawn races in some of the ceremonies (Hough, 1915, pp. 108-109). Racing was a feature of many ceremonial occasions, but, aside from this specialized feature, all boys and girls were trained in running. Travel to specific areas for collecting and gathering food and other materials was a part of the annual round of life for both men and women.

Plants: Hough (1915, p. 6) noted the use of seeds of wild and tame plants: "Hopi women assiduously gather the seeds of grasses and other plants, which they grind up and add to cornmeal to improve the flavor of the bread, or, perhaps, a prized bread is made entirely of the ground seed of some desert plant. Oily seeds, such as those of the piñon, pumpkin, and melons are ground to form shortening in various cakes and to add richness to stews. Often food is colored with harmless vegetable dyes. . . Our tradition of spring lamb with mint sauce is duplicated by stewed rabbit with nanakapshi greens, which, with various other herbs, are put to appropriate use by the master of the Hopi culinary art."

He comments: "There are few Hopi who do not know the herbs and simples, and some are familiar with the plants that grow in the mountains and canyons, hundreds of miles from their villages. Even the children know many of the herbs. . . Many a time, as the legends tell, the people were kept from famine by the plants of the desert. . . . Perhaps all the

Hopi believe that the wild plants are most valuable for healing and religious purposes, for the plants they use in medicine would stock a primitive drug store. Bunches of dried herbs, roots, etc., hang from the ceiling beams of every house. . . and, as occasion requires, are made into teas and powders for all sorts of ills" (Op. cit., pp. 57, 58).

Sumac twigs and rabbit brush are used by Third Mesa women in making wicker plaques, baskets, "paper bread," trays, and baby cradles; the rabbit brush grows nearby but the sumac is from the mountain valleys and cliff recesses (Op. cit., p. 92). Thin "checker mats" for use on the floor and, in the past, for wrapping the dead are made of yucca leaves or rushes. Roofs of houses are constructed by placing a layer of "rods or willow brush" across the heavy pine or cottonwood beams, on top of the brush is a layer of grass or small twigs, capped with clay.

Whiting's more recent list of wild plants obtained at a distance indicates something of the extent to which the Hopi moved out from their home villages for obtaining what they considered to be the necessities of life:

> Many plants are obtained from the higher altitudes in the general vicinity of the San Francisco Peaks, eighty miles to the southwest. These include pine for roofing timbers, oak and holly grape for tools and weapons, mountain mahogany for dyeing leather, tobacco for ceremonial purposes and beebalm for flavoring food. Beebalm, Douglas fir, and oak can be obtained in small quantities thirty or forty miles to the north of the Hopi villages and occasionally tobacco may be found on the desert. Mescal (Agave) however cannot be found in the Hopi country and must be obtained by trading with the Havasupai (Whiting, 1959, p. 49).

In discussing the Hopi in relation to their environment, Whiting summarizes the many plants, cultivated and wild, utilized by this Pueblo group: 40 cultivated plants, 10 semicultivated, 54 wild plants used for

food, 47 plants used in construction and in making implements and doing decorations, 65 medicinal plants, 37 ceremonial and magical plants, and 15 as plant symbols. Breaking down the category of wild plants used for food, he gives 5 used in preparing corn dishes, 10 as staple foods, 15 as spring greens, 8 as seasonings, 4 as beverages, 8 used as delicacies between meals, and 12 relied upon when crops fail. Under construction, implements and decoration, we find 3 used in making agricultural implements, 9 in construction, 3 in fire making, 6 as firewood, 14 in the pursuits of hunting and warfare, 8 in music, 24 in arts and crafts, and 14 in personal decoration. To supplement this list, Whiting explains:

> When we realize that there are little more than two hundred wild species of flowering plants in the vicinity of the Hopi villages, we marvel at the apparent thoroughness with which the Hopi utilize these limited resources. Actually less than a hundred wild plants are used in everyday life. This list is misleading for in addition to considerable duplications, it includes a number of plants obtained from outside the local flora. . . Although the plants which are not used in everyday life are numerous, the list of plants for which no use has been suggested either by the Hopi interviewed or in the literature, is surprisingly short (Op. cit., pp. 48, 49).

In looking into Whiting's list of wild plants brought into Hopi from some distance, we discover that most are of such fundamental use that tribal dependence upon them for centuries probably should be considered. For instance, sand grass, a reed-like grass growing in "a valley of the red cliffs area near the edge of the Painted Desert south of the Hopi towns" has several uses. A reed receptacle is made by fastening the reed stems together with fine spun cotton strings. It is usually about twenty-two inches wide and four and one-half feet long. It is used as a carrying case for a part of the wedding garments. Stephens describes,

"a reed mat which can be spread on the floor to pile the carded cotton upon, and may be rolled up as a scroll, wrapping up light unfinished fabrics" (Stephen, 1936, p. 626). Nowadays it can often be seen hanging on the wall covered with snapshots. Mindeleff (1891, p. 126) describes the use of this reed in the construction of a Second Mesa kiva in which it formed a primitive lathing which was covered with adobe plaster. Stephen reports a similar case in Oraibi (Stephen, 1936, p. 726). This grass also is used in making pahos (prayer stick ceremonial offerings set into shrines) and as decoration for the headpiece of the Jemez katcina mask, thought to have been introduced to Hopi by Jemez who spent some years with the Hopi during the general period of the Pueblo Rebellion (Whiting, 1959, p. 65). Reed mats of this type have been found in prehistoric sites in the Kayenta area, Aztec Ruins, Mesa Verde, Chaco, etc.

The bark of the mountain mahogany "Growing in higher altitudes at some distance from the reservation" is used in dyeing leather to a reddish brown color and the wood is made into the hard battons and combs used in weaving (Whiting, op. cit., p. 78). Bark from the Black Alder is required for use in the dye process. "The trees grow in Oak Creek Canyon and in the White Mountains where the Hopis must go to procure it. . . Only this one species of alder will do, for its inner bark is bright terracotta color." For a mordant the leaves of the juniper of any species or saltbush are burned to obtain the ashes (Kewancoytewa and Bartlett, 1946, p. 23). Beebalm which grows "especially in the higher altitudes, particularly along the road to Pinyon," though other species are used when available, ". . . is in great demand among the Hopi and the Hano Tewa (Robbins, et al., 1916) as a pot herb. It is gathered and dried in bundles for winter use."

Occasionally this plant is cultivated (Whiting, op. cit., p. 91). Wild tobacco is of two types. "The first species occurs commonly along roadsides in the higher altitudes of the transition zone, and both are found sparsely on the desert. It is said that tobacco is cultivated sporadically. Today native tobacco is smoked in pipes for ceremonial purposes only. Cornhusk cigarettes are reported by earlier writers. In general the smoke is associated with clouds and hence has power to bring rain. Smoke is also said to carry the prayers of the people to the gods. . . Tobacco is mixed with other plants for ceremonial and medicinal purposes." One phratry is named for this plant. A "sacred" tobacco (Onosmodium thurberi) occasionally found in the higher altitudes of the transition zone, is powdered and mixed with the native tobacco to make it more efficient in bringing rain (op. cit., p. 88). Aspen also is ritually smoked (op. cit., p. 71). The use of tobacco among the Pueblos is known to go back centuries. White fir, which grows on the higher slopes of the San Francisco Mountains (Op. cit., p. 62), also is used for ritual smoking in which the object is to make a cloud and thus to suggest, by imitative magic, that clouds bring rain to Hopi lands. A clan is named for this tree. A fern (Spleenwort) which is found "among rocks at higher levels away from the reservation" is soaked in water and the solution is painted onto prayer sticks to help bring rain (Op. cit., p. 99).

Bear grass, which is not found in the Hopi country but farther to the south, apparently is referred to when the Hopi speak of a "long leaved yucca," valuable for fiber (Op. cit., p. 70). It is important to all the more southern tribes. The Holly Grape is a shrub "growing at higher altitudes and in canyons a considerable distance from the Hopi villages." Its strong wood is used for tools, arrows, spindle shafts, and battens. It also is used medicinally (Op. cit., p. 76).

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The sage used by the Hopi is "a shrub of rare occurrence. . . Seen only in a canyon near Winslow road south of the Hopi Reservation." It is much valued as a medicine. (Op. cit., p. 91.)

The broad leaf yucca, found "in the canyons and on mountain slopes south of the Hopi country" had three important uses. The fruits were baked in ovens and cherished for their sweet flavor. The leaves occasionally were (and are) used in basketry and the roots for soap (Op. cit., p. 71). The Century Plant or Agave also is used for food, the leaves and deformed buds being baked. "The stalk is said to have been used as a lance shaft in ancient times." A Hopi clan and a Hopi religious society are named for this plant, although it now reaches the Hopi through trade only (Op. cit., p. 71). Yucca leaf fiber was used for cordage.

Yellow pine, "the dominant tree in the regions of higher altitude," and usually brought to the Hopi towns from the San Francisco Mountains, is used for all kiva ladders and for large roof timbers. That this was so centuries back is indicated by tree ring dates obtained from specimens still being used in Hopi structures. "Pine needles are attached to prayer-sticks to bring cold." (Op. cit., p. 63.) Hough is incorrect (1919, p. 275) in stating that the pine was too distant to be available; but it was not used for small items. (See Hough, 1915, pp. 96, 97, for statement of actual use of pine beams from mountains by the Hopi.) Douglas fir, found on the high slopes of the San Francisco peaks and somewhat lower in certain canyons, is made into ruffs, arm bands, etc., for many ceremonies (Colton, 1959, p. 16). One clan is named for this tree. "The Hopi of the Second and Third Mesa obtain branches of this tree from the mountains near Pinyon, about thrity-five miles to the north" (Op. cit., p. 63). Oak of

several different species is procured in the mountain regions, "far to the north of the villages." The wood is used in making rabbit sticks, bows, digging sticks, clubs, weft battons, axe handles, and other utensils, including spurs (Hough, 1919, pp. 276, 287, Plate 22). A Hopi clan is named for the tree (Whiting, op. cit., p. 72). Arrows were made of oak shoots, sprouts of sumac, or wild currant (Hough, 1919, p. 288).

The piñon and juniper (cedar) were important to the Hopi. Hot piñon gum (pitch) was used for coating Hopi water jars to make them waterproof (Colton, Mary Russell, 1938, p. 10). Piñon and cedar were sometimes used forfuel in old days, though greasewood, sagebrush and corn stalks and cobs were more commonly used. Dried dung from the corrals was used for the same purpose when nothing else was available (Fewkes in Parsons, 1922, p. 255). Roasted piñon nuts still are eaten as a delicacy (Nequatewa, 1954, p. 24) and in former times stores of them were cached in crypts in house walls to be kept as food for time of famine. Juniper berries were picked in winter, after frost-bite had made them sweet, and served with fresh piki (wafer bread). Juniper leaves were boiled to make a drink widely used for medicinal purposes, from colds to post-parturition cleansing.

Hough (1919, p. 275) notes that the only tree of general use in the vicinity is cottonwood (Populus monilifera), which grows along washes and near springs. This tree is the basis of the Hopi wood-working industry. Drums, feather boxes (for containing the feathers used in ceremonial paraphernalia), and other small objects are made from the wood. Cottonwood as well as pine was used for house beams (Hough, 1915, pp. 96, 97). The latter entailed "a journey of eighty or a hundred miles, requiring immense labor." Piñon grows at a somewhat less distance and sometimes is used

beams, etc., but its size makes it less useful than pine. Juniper is too crooked and brittle to serve for much but firewood, but its bark was shredded and used for the slowmatch, diaper pads, etc. Yucca flowering stalks and wands of the rhus (sumac) and willow were mentioned as among minor wood stuffs of some value (Hough, pp. 275, 276).

Cottonwood and its roots (some obtained from washes near the mesas but more from driftwood along the Little Colorado) are used in carving katcina dolls, parts of masks, animal figurines such as birds, prayer offerings, altar frames, lightning sticks, altar slats, etc. (Hough, 1919, p. 276; Colton, 1959, p. 9). Expeditions still are made to collect large supplies of the cottonwood roots from near Winslow. Colton estimates that between 500 and 1000 katcina dolls are made by the Hopi per year (Colton, 1959, pp. 10, 11), entailing a considerable consumption of wood. Before these became commercial articles, the number would have been lower, but making these images in numbers to give the children (for instruction as well as gifts) is old in Hopi tradition. Root collecting and turtle hunting expeditions to the Little Colorado sometimes are combined (Beaglehole, 1937, p. 56; Tietiev, 1944, p. 195; Thompson, 1944, p. 22). Logs were felled and cut into short lengths by means of fire as well as stone axes and hammer-mauls. The stone axe was used in pealing the logs. The stone rasp, the knife and saw of chert, and the drill and smoothing stones (mostly sandstone) were used. It is thought that the wedge was not known, but it is far from certain (Hough, 1919, p. 276).

As there is almost no timber or firewood near the Hopi mesas, to obtain fuel for cooking and certain types of wood for craft work frequent expeditions are made to the forests on Black Mesa, a day or more to the north.

Each year the men must go farther to secure adequate supplies. With wagons the men in the 1930's had to devote two days to each load, riding out some ten or fifteen miles to timber country and loading up the first day, and driving home slowly on the next. Usually five or six trips are made during the fall to ensure a sufficient supply for the winter. Beaglehole records trips made to Piñon on Black Mesa to obtain mountain oak wood for throwing sticks (Beaglehole, 1935, p. 20; 1937, p. 56).

In the past there was annual wood gathering in November when the men of First Mesa went with burros to a wooded mesa six miles north of the ruin of Sikyatki. When the men were expected to return, the Town Crier announced that the girls of the village, dressed in their best, should go to a shrine spring, Monwiba, on the trail where the men would appear. The priest-chiefs put prayer offerings on the trail and greeted the wood gatherers with a "thank you" as they appeared. Each girl presented her favorite boy friend with a little packet of corn meal mush as he passed. She then followed him up the trail. When all the wood gatherers had passed, each of the old men gathered a bundle of greasewood and carried it up the trail to the village on his back. Fewkes first witnessed this old wood-gathering procedure in 1900 (Fewkes, 1906, pp. 353-354).

Beaglehole mentions many of the wild plants listed by Whiting and adds a few others. Small household groups may go out on picnics to favorite gathering spots, for mesquite grass to serve as brooms, or for medicinal herbs. At times large numbers are called out by the crier chief to go out as a group gathering party. Wild mint grass is collected thus, also wild potatoes, and young leaves of pine, spruce, and aspen; these are mixed with tobacco for ceremonial smoking (Beaglehole, 1936, pp. 50-51).

Hough, in 1897, after noting the grass and the sumac twigs used in Second Mesa coiled basketry, the wild tobacco smoked on ceremonial occasions, and the Jimpson weed (Datura metaloides) used, though very rarely, by the Hopi and much decried by the tribe as a whole, commented:

> It is true that the Hopi extend their environment by long journeys for various substances. Every berry patch for many miles around is known and visited; a journey of 200 miles or so for salt from the Grand Canyon, wild tobacco from the Little Colorado, water from Clear Creek (a tributary of the Little Colorado, near Winslow), or pine boughs from the San Francisco mountain, the home of the snow, is thought of little moment. . . The knowledge of the resources of a vast territory possessed by the Hopi is remarkable and the general familiarity with the names and use of plants and animals is surprising. Even small children were able to supply the names, corroborated later by adults.
>
> The ancient Hopi were apparently in nowise inferior to their descendants in these matters, as was proven by the excavations undertaken by our party last summer (Hough, 1897, pp. 35-36).

Nequatewa (1954, pp. 24-26) gives Hopi recipes for preparation and use of piñons, cedar berries, fruit of broad and narrow leaved yucca, currants, prickly pear, cholla cactus buds, tomatilla berries, tansy mustard, lambs quarters, wild onions, wild potatoes, fetid marigold, the giant dropseed and Indian millet which are ground into flour, the squaw-bush berries used for making a drink like lemonade.

Stone for Manfacture of Implements: The stone for the griddle on which piki, the staple corn wafer bread, is baked is quarried at "Duna, ten or fifteen miles south of Oraibi, or from a deposit of rock at Manakavi, which lies about twelve miles southwest of the village (Oraibi)" (Tietiev, 1944, p. 197). Only a certain type of stone may be used for this slab, as it must be able to stand the heat of a fire built directly beneath it, without cracking.

Salt:

> One of the products of the more widely extended environment that the Hopi gathers at regular intervals is salt. Formerly this was obtained from deposits in Marble Canyon, close to Grand Canyon. Prayer sticks were deposited at the shrines of the Salt Woman and the Twin War Gods near the Canyon and the men either suspended themselves with ropes from the rim of the Canyon and broke off stalactites of salt from the sides of the cliff or else clambered down to the floor of the Canyon by means of ropes, trees and a step ladder and obtained salt from the Canyon bottom. This salt was brown in color, a soft rock salt, easily ground down but when added to food it turned the latter a yellowish color. The Canyon deposits later became too difficult of access and salt today is obtained almost exclusively from the Salt lake forty-two miles south of Zuni, though Mishongnovi men on occasion used to obtain some salt from deposits on the wash southeast of the mesa (Beaglehole, 1937, p. 52).

The journey was considered dangerous because of the descent by yucca ropes into the narrow canyon, and because the Grand Canyon nearby is considered to be the home of the dead (Colton, 1946, p. 3). Moreover, in the old days, enemies might be encountered on this annual journey. Offerings are left at numerous shrines during the trip. (See description in section on Hopi shrines and Sacred Places, this chapter.) For description of salt deposit in Grand Cañon and of route to deposit, see Eiseman, 1959, and unpublished more detailed manuscript deposited with Museum of Northern Arizona, Flagstaff, Ariz.

Stephens (1936, p. 994) tells of the Hopi going to the salt lake south of Zuni for salt in 1887. Beaglehole (1937, pp. 52-55) describes the trip to the Zuni salt lake, collection of salt there, and the numerous rites considered essential, both before and after the salt gathering. Prayer plumes are set up in a shrine on the south side of the lake. Stevenson (The Zuni Indians, p. 357) notes that prior to 1902 the Hopi deposited prayer sticks in two circular-walled chambers built of blue clay similar to those used by the Zuni, but in a different section of the lake. Apparently Mexican salt gatherers had destroyed these chamber-shrines by this date (1902) (Beaglehole, 1937, footnote 5, p. 53). The trip is considered full of

peril not only because of natural dangers, but also because the Salt Woman may be malificent. Zuni, Laguna, Acoma, the Hopi - and the Navaho - all obtain salt from this lake and leave prayer offerings at shrines there (Ibid., pp. 52-55).

Pigments: Many dyes and pigments are obtained from wild plants and from clay deposits near the Hopi mesas, but considerable trips are made for some. (See discussion under "Coal, Clay and Pigments," in section on "Hopi Home Area.")

Chips of chert, chalcedony, and obsidian formerly served for cutting rawhide and tanned skins and anything else requiring a sharp edge (Hough, 1919, p. 280).

Quartz crystals were used as part of the ceremonial paraphernalia (Hough, 1919, p. 295).

Hopi Shrines and Sacred Places

The Hopi recognize about thirty-two major supernaturals or dieties, most of which are not impersonated or represented by carved "dolls."

The Hopi origin legend shows the marked similarity to the Zia, Laguna, and Acoma origin legends, basis of their religion. To this four-way parallel, we can add the fact that the Navaho origin legend is very like that of all these pueblos, though in some points, such as details concerning the Twin Heroes or War Gods, and the tales of their killing the Giant, the Monsters, etc., the Navaho are closer to the Laguna than to the Hopi.

The war gods are sons of the Sun [Oshats, the father, who "travels the sky every day, ending his trip in the kiva of the woman of the hard substances in the Pacific ocean" (Colton, 1947, p. 12)] and of the earth

mother, one of two sisters (sometimes one child from one sister, one from the other) created by Spider Woman. This earth mother [Hopi: Huru-ing wu-itti "thought of as an ugly old woman in daytime, beautiful young girl at night. Her home is a kiva in the Pacific Ocean." She is goddess of turquoise, shell ornaments, and wealth. (Colton, 1947, p. 12)] has the specific attributes of the Navaho Changing Woman, "goddess of hard substance," one of the two wives of the Sun, the other wife being the other of the sisters. Changing Woman, growing old but renewing herself, represents the changing seasons, spring, fertility, etc. In one manifestation she apparently also is Salt Woman, "Woman of the Hard Substance," associated with salt water of the ocean, salt lakes, salt deposits, etc.

The Moon (Ibid.) also is of high rank among Hopi, Keres, Navaho, etc. The Hopi and Keresan Gods of the World Quarters, the six cardinal directions (our four plus Up and Down) are warriors. There are many animal spirit supernaturals. And then there are the katcina, some of whom are rain spirits and some animals or other spirits. The Hopi also recognize a God of the Gamblers (Op. cit., p. 15), a shaggy haired old man who lives in the underworld but used to mingle with the people and play tricks on them. He parallels the Keresan Gambler, apparently the prototype for the Gambler of the Navaho legend. The elderly Salt Woman (Op. cit., p. 13), for Keres, Hopi, Zuni, and Navaho, lives in the salt lake forty miles south of Zuni, where all of these groups formerly obtained salt.

Several shrines have been erected to various of the supernaturals, Sky and Sun dieties and "such earth beings as Spider Woman, Tuwapontumsi, Muyinwu, and Masauu" (Fewkes, 1906, p. 350). There are also shrines to the war gods, shrines at springs, (Water Serpent), shrines to the katcinas, and shrines at certain animal "homes."

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The shrines vary in form and construction. A spot where a sacred image is permanently kept is a shrine, but so may be a natural cleft in the side of a boulder or cliff because it is thought of as a symbol of some supernatural personage. One of the most common types of Hopi Pueblo shrines consists of a ring or pile of stones placed to form an enclosure (usually with a large rock at the back) for reception of offerings. If a shrine is abandoned because too difficult or dangerous of access (as when predatory tribes raided too near) a new shrine is built to hold images (though not found in all shrines), but the old still is regarded with reverence and offerings are placed there on special occasions. Shrines commonly contain concretions and stones of unusual shape or color as offerings, as well as the frequently prepared "prayer plumes" or "prayer sticks" known to the Hopi as "pahos" of various styles, which are made by leaders or members of the many religious societies in connection with their specific ceremonies (Fewkes, 1906, p. 350). Small, and sometimes larger, vessels also are placed at some shrines.

Some shrines, as well as springs and kivas, are regarded as practically symbols of entrance to the underworld realm of the dead and spirits (Fewkes, op. cit., p. 374).

All shrines are not of what might be termed permanent construction. Fewkes describes "World Quarter Shrines":

> In certain of the great Hopi festivals, as the Snake dance and the Flute ceremony, but more especially in the former, it is customary for the priest to deposit prayer sticks for rain in temporary shrines situated in the four cardinal directions from the pueblo. These sticks are made for seven consecutive days, their length each day being less than on the preceding day. The shrines in which the offerings are placed are situated at distances also diminishing day by day from the maximum, -- about five miles. On the last day prayer sticks no

> longer than the first joint of the finger are placed on the four sides of the entrance to the room in which the offerings are manufactured. These temporary world quarter shrines and the offerings placed in them are located at constantly diminishing intervals in order to call the Rain gods from their distant homes to the pueblo (Fewkes, 1906, p. 361).

These shrines would, as described, be within a five mile range of the mesas. At the close of the snake dance the long black prayer sticks (and one snake apiece) are deposited in four shrines located at the base of the mesa and named for the world quarters. Pictographs of snakes are to be found on boulders close to some of these shrines.

The Hopi recognize over two hundred katcinas. Some are very old, but new ones may be invented from time to time to represent the spirit of animals or peoples not previously represented and one, the Cross-legged Katcina, is explained as representing the spirit of a very kind Mishongnovi man who died some 70 years ago (Colton, "What is a Kachina?", in Hopi Customs, Folklore, and Ceremonies, MNA Reprint Series, No. 4, 1954, pp. 14, 15; originally in Plateau 19:3, 47). The first katcina who appeared to the people was Chaveyo, said to have been seen accidentally near the San Francisco Peaks by some Second Mesa men, and later located in a kiva there upon the mountain. The people were told by the katcina that his group was made up of immortal spirits who lived in kivas here and there, each kiva having a little hole (sipapu) leading down into the Underworld. Each of the animal spirits had his little kiva in the earth, as well, where he rested in human form between excursions onto the earth in animal form. This is why the Hopi (and other Pueblos) pray forgiveness for killing animals necessary to their use, carefully explain their need, and ceremoniously make offerings to the killed animal and, for many, place the skull on a certain shrine or in the forest, returning it to nature (Nequatewa, 1946, p. 61).

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Chaveyo and other similar spirits came to Hopi and taught the people the katcina cult and ceremonies, especially designed to bring rain. Some time later, when the people failed to show sufficient respect for the katcinas, they no longer came and the people learned to make masks and go through the ceremonies themselves, offering prayer plumes so that the supernaturals would give them aid (Nequatewa, 1948, pp. 18-20). Most of the Hopi katcinas are considered to live on the San Francisco Peaks, from where they come in the spring at the beginning of the planting season (February-March) to spend the summer among the Hopi, and returning to the mountains after the Niman Katcina or Home Dance, at the end of the growing season. The San Francisco Peaks contain shrines (devotional places) and are sacred as the home of the katcina, as well as being one of the markers of Hopi domain. A fetish image of these peaks is made in pottery for the altar equipment of one of the Hopi religious societies.

There are also shrines to others of the supernaturals and shrines to the spirits of various things in nature, the prayer offerings at these shrines being in the nature of combined thanks for the benefits rendered by that natural object (ex. - all springs), and a plea that the object continue to replenish itself and permit man to use that replenishment. Some shrines belong to certain clans or religious societies, others to certain villages, and some to all of the Hopi.

Hough describes numerous shrines which "abound near each pueblo and are likely to be happened upon in out-of-the-way places among the rocks where the offerings are scattered about" (Hough, 1915, p. 175). Where one of the earlier Walpi villages once stood at the point of the Mesa are several shrines, one being that to which the katcinas go after ceremonies to deposit the wreaths of pine they have brought from the San Francisco mountains and to make offerings of sacred meal and food.

Numerous other shrines are located on the mesas and in the center of the main plaza of each village is a stone box with stone slab to cover its eastern opening. This is the central shrine, carefully closed when not in use. Each field has a shrine where prayer sticks are placed from time to time.

The sacred equipment of Hopi religious societies is kept in crevices just below the upper edge of the mesa and any spot containing such equipment is considered to be more or less sacred. "Other holy places, most of them ruins of abandoned towns, are visited at times by this people, who cheerfully make long journeys to mountains and running streams for sacred water, pine boughs, or herbs. They carry with them feather prayer-sticks and sacred meal as offerings to the gods of the place" (Hough, 1915, pp. 176, 177).

Tietiev mentions a shrine located in a prehistoric ruin (NA 2418) on Second Mesa (Tietiev, 1938, pp. 40, 41), a shrine near Mongyavi (Porcupine Peak), a prominent rock on the mesa east of Oraibi (Ibid., p. 41), and one in the range of hills on Black Mesa northeast of Pinyon (Ibid., p. 42).

Fewkes speaks of old shrines near Awatobi, one being near a ruin to the west of the main pueblo, not far from the sand hill burial place. Another was at the extreme west end of Awatobi mesa among the foothills; this shows recent as well as past use. There also is a shrine of Alosaka 50 feet below the old ruin at the most precipitous point of the mesa (Fewkes, 1893, p. 384; 1906, pp. 347-348).

Parsons comments on a series of spots pointed out to her as on the route

> followed by the Patki clan when 'after the children had had a hard time with mosquitos' the clan came up from Momolovi in the south, seeking Sihtakwi (Hopi). As Crow-wing and I travelled over this route, from the First Mesa to Winslow, a spring the Patki clan claimed a few

> miles from the First Mesa was pointed out; also a ruin, Pakotsumo, Little Hill, about four miles to the south. Several miles further on there was a circle of black stones. Men passing by always pick something and throw it from them as the women throw baskets in the Lalakun ceremony where black stones are set in a circle in their dance (Parsons, 1933, p. 35).

These all were shrine spots, and the circle of stones is but one of the many found here and there in the Hopi country, Navaho area, and elsewhere in the Southwest, where the idea of putting a stone or a twig on the pile for good luck is widespread.

Hough speaks of a heap of small stones which make up the shrine of Masauu(h), god of earth, death, and fire. "No orthodox Hopi would dare to omit throwing a stone accompanied with a prayer to Masauuh, of whom all speak in fear and with bated breath. For a good reason, then, many shrines to this god may be seen in Hopiland, as it is necessary to appease this avenging being" (Hough, 1915, p. 176). Fewkes mentions such stone piles (Fewkes, 1906, p. 354) and adds that stones similarly are deposited in natural crevices of boulders or cliffs.

The shrines at or near abandoned villages are considered to still belong to the people, or the specific clan, which formerly occupied that village and built or used the shrine. Fewkes points out the identification of the use-group for such shrines as a method of checking on clan legends claiming former occupation of certain ruins and recalls, as example, the fact that when the sacred images of the Alosaka, earth mother, were removed by someone from the old shrine near Awatobi and taken to Thomas V. Keam's trading post to be offered for sale, the post was at once visited by almost the entire population of Mishongnovi, descendants of Awatobi clans, begging for the images. He gave them to their priests. Several Awatobi springs and

shrines were being used ceremonially by certain clans living at Hopi who claimed them through their ancestors (Fewkes, 1906, pp. 347-348).

The same is true for sites at much greater distance:

> Even remote ruins like Homolobi, Kicuba, and Lenyanobi are still regarded as the property of the clans that once inhabited them, and their old shrines and springs still figure in the ceremonials of those clans.
>
> Another instance of the verification of a clan migration by ownership and position of a sacred spring is suggested by Sisibi, near the Noki buttes. This spring lies on the trail taken by the Southern people of Walpi in their migration to that pueblo from Homolobi. It is visited annually by the chief of the Kwakwantu, a warrior priesthood of Southern clans, for sacred water used in the New Fire ceremony.
>
> Several clans are said to have migrated separately or together from Homolobi, northward to Walpi. Among these were the cloud, Lizard, Tobacco, Rabbit, and possibly the Young Corn. The Flute, Sun, Squash, and others had preceded them in this migration. When some of the clans came to a place called Kokopelti a short time before they reached the Moqui buttes, the Young Corn separated from the others and then or a little later the Tobacco and possibly the Lizard went to Awatobi. The remainder continued their journey to a pueblo called Pakatcomo, later to Tawapa, and ultimately joined the Walpians. After the destruction of Awatobi the Tobacco peoples were united with their former kindred in Walpi (Fewkes, op. cit., p. 348).

Some shrines are given the name of pueblos, now ruins, formerly occupied by ancestors of those who now recall that pueblo by the shrine set up nearer to the present villages. Kivas sometimes are similarly named. An example is the Pakatcomo kiva (since re-named Mon kiva) named from the ruin of that name where the Patki people once lived. Fewkes notes that there formerly was a kiva on First Mesa known as Homolobi for the same reason (Fewkes, 1906, p. 367, fn. 1). This is good evidence of the conviction of these people that the ruins from which the names are duplicated once were their homes. Water from sacred springs, especially those associated with early migrations, is considered most efficacious in

"medicine-making." Water from traditional springs also is used otherwise in ceremonies and prayer offerings are left at these spring shrines when water is taken (Op. cit., pp. 370, 371).

Tietiev's account (Tietiev, 1937, pp. 244-255) of the salt trip made by Don Telayesva and two older men in 1912 brings out not only the importance of this journey but also the many shrines located on the route to this deposit in Salt Canyon, a branch of the Grand Canyon. After some personal ceremonial preparations, the men went from the Hopi mesas to Moenkopi, where they found several others making prayer-feathers to be placed at a spot not far from the salt deposit, from which yellowish clay was to be obtained and brought back to them. This clay deposit, is considered to be the sipapu from which the Hopi came out from the underworld and every man in the Soyal ceremony must have a supply of the clay.

The men traveled with burros. A short distance out of Moenkopi the men left offerings opposite a sacred spring and later when they passed another, and when they reached the first of several salt shrines said to have been established by the Twin War Gods, and near which the Hopi used to hunt. From here they went to a shrine known as Tutuveni (Writing), identified by Colton as Willow or Oakley Springs (Colton, 1946, p. 3), where they stopped and each man carved or pecked his clan symbol onto the face of a large sandstone boulder. This is his signature, and the rows of clan symbols testify to past trips. The boulder is a shrine and prayer plumes are left with the signatures.

The next stop was at Totolospi, a shrine where each member of a salt party must "play a game" with the Twin War Gods, and win, so that a successful journey, rain, crops, and good health may be enjoyed. Offerings are left. From here they went to the shrine of the Salt Woman,

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went through a brief ceremony, left offerings, and went a short distance farther to camp for the night. They rose early next morning and soon began the descent into Salt Canyon. Offerings were left at two jagged rocks considered to represent images of the Twin War Gods. They passed "Broad Cliff" the special home of the dead from the Reed (Pakab or Bakab) clan, passed the shrine known as Fur Carvings and left offerings, and onto a shrine known as Mountain-sheep Upper Story, said to be the home of mountain sheep, where they saw fresh tracks and droppings. Offerings were left. The next spot named was marked with a flourishing growth of agave, and here the Havasupai and possibly Paiute formerly came to gather the agave and prepare it for food. Next they left offerings at a stone considered to be "home of chickens," and then reached a "hollowed out-cave-like spot," where the God of Death was said to live. One man of the warrior society or of one of the clans closely affiliated with war must enter this cave on each trip to deposit feathers and corn meal and look for favorable signs predicting good or bad harvest. The next "home" is that of the Koyemci (sacred clowns) where prayer offerings are left. The stream is followed toward its junction with the Colorado. At spots known as "Blue Salt" and "Brown Salt," salt of those colors is obtainable but is not collected because it is considered not to have the flavor of that in the main deposit. Offerings are left, however.

From here it is not far to the "original sipapu" at "the Kiva," a spot outlined by soft damp earth where bushes grow. From these bushes stems are taken to serve as firedrills in making new fire for the Wuwutcim ceremony in November. The water in the "sipapu" boils when one shouts, as if in response. Clouds come out from this sipapu to go to the east (Hopi) to the most worthy people who summon them. A small ceremony is done here

and the yellow clay is gathered nearby. For each handful removed, a prayer feather was deposited. The men were very tired by the time they reached the point where the Little Colorado merged with the Colorado, but after a small lunch and sip of the river water, considered sacred, they went on to where they must make the final difficult descent by sliding down a rope which they attached to a boulder supposed to be an image of the Elder War God. Below is a natural rock basin which receives a constant drip of salty water, from which the sacred salt must be tasted and rubbed over oneself. Little images may be made of dough and deposited on the natural stone bowl to be left for a year, when they will be retrieved as "stone pets" covered with a hard deposit. An important shrine (the home), of the Kwan society, is in a cave nearby. After offerings are deposited, the party is finally ready to collect salt. No offerings were deposited on the return trip, but those previously left were examined to see whether they had been well received by the supernaturals.

From Stephen's Appendix 5: Place Names and References (Stephen, 1936, pp. 1152-1169) and Fewkes partial list (Fewkes, 1906, pp. 351-375), one can make a list of the Hopi shrines and sacred spots where ceremonials are conducted or material for such is obtained, though both lists pertain only to First or East Mesa. The list gives something of the extent of area considered by these people to comprise their special sphere, what Hough calls their "earth center." Fewkes gives sixteen other shrine springs without stating location, and Stephen names many other shrine spots on the mesas or inside the pueblos, which we have not set down. Sites marked in our lists as "shrine, etc." are those where ceremonial affairs other than the deposit of prayer offerings occur.

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Hopi Shrines (apart from those in the villages) of First Mesa

(Stephen, Hopi Journal, Pt. II, Appendix 5: Place Names and References, pp. 1152-1169; Fewkes, "Hopi Shrines Near the East Mesa", Am. Anth., Vol. 8, 1906, pp. 346-375. Pages listed, without other reference, and maps, are from Stephen.)

1. Altutushkya, Horn shrine - below southwest point of First Mesa. (1153)

2. Amuba - spring on east side of First Mesa. (1153) (Fewkes, Amipa; 1906, p. 372.)

2b. Atutuskia - to right of road in foothills east of First Mesa. (Fewkes, 1906, p. 366.)

3. Bolíki - Butterfly House, shrine on oval mound on extreme southwest of First Mesa near Snake Shrine and Niman katcina shrine; Wind shrine is beyond. 1/2 mile from Tuwanashabi. See Maps 1, 4, 6. (1153)

4. Bonsikya or Rush Canyon, part of Keams Canyon, 10-12 miles east of First Mesa, spring here is associated with Cedarwood clan, one of the localities farthest away from First Mesa to be planted. (Others are Wipho, 4-5 miles north of Walpi, and Sheep Spring, 2 1/2 miles north of Walpi. (Map 7) (1153)

5. Spring in Cataract Canyon area but slightly east of it, where Hopi go to obtain yellow pigment, also clay and reed to be used in a kiva ceremony. (1154)

6. Chai yumpakiwu' ta (where the War Gods turned two children to stone) at northeast side of First Mesa. (1154)

7. Chuaki - Snake shrine, southwest shrine, at butte beyond Butterfly shrine. (1154)

8. Chubmo - Rock mass east side of West Valley southwest from Wipho 1/3 distance from Sheep Spring to Wihpo, Snake, Antelope, and Flute racers start from here. (See map 7) (1154)

9. Grand Canyon of the Colorado (near Cataract Creek) (Pisisvaiyu) - Sipapu or the emergence, near salt deposits and bubbling spring where yellow ochre is obtained. (1154-1155)

10. Halakabuki, Whirlwind House - shrine in crevice or sand dunes, southeast of Butterfly shrine. (1155)

11. Hao'a - a shrine on cliff on east side, just under Awatobi.

12. Hazrütüwa - a knoll in foothills close to base of mesa east from Walpi, supplying sand for ritual bean planting. (1155)

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13. Hocho'koba, Hostho'ditho (Juniper spring) - in East valley north of Sikyatki. Salty clay is found here and prayer sticks are deposited. This clay is used in flavoring foods. (1155)

14. Homolobi - home of Patki clan on Little Colorado; also name of site of an old kiva at east base of First Mesa, which belonged to Patki clan and was named after their old home. (1155)

15. Hopok paho'ki - northeast shrine. (Map 3), (1155)

16. Huchiovi (The Break) - the narrow neck on northeast end of Walpi, shrine location, etc. (1156) (See also Fewkes, 1906, pp. 365-366.)

17. Hukyatuwi (Wind Terrace) - mesa in the eastern range. (Maps 8, 9) at base of which "moisture moon" prayer sticks are made. (1156)

18. Hutchimopa - small spring in plain below Walpi (Fewkes, 1906, p. 372).

19. Íspa or Ísba (Coyote Spring) - a major spring shrine east of Tewa, southwest from high yellow foothills; rituals performed here, etc. (1156) (Map 3) (See also Fewkes, 1906, pp. 353, 371.)

20. Kaha tniopi, Kaibitho (Tit Butte) - spring in buttes south of First Mesa. (1156)

21. Kahabipa - Comar Spring. (Fewkes, 1906, p. 371)

22. Kanelba (Sheep Spring) - 2 1/2 or three miles from Walpi on north side of First Mesa. Shrine, etc. (1156)

23. Katcinaki - katcina shrine, a shallow cave almost under Sichomovi on side of mesa. (See Fewkes, 1906, p. 357.)

24. Kautaktipu (Corn Burned Ruin) - in foothills in West valley, a village claimed to have been Hopi but destroyed by Utes and Navahos banded together. Red ochre found here. Gardens tilled as late as early 1800's. (1157)

25. Kishyuba - mountain spring of the katcina 30 miles northwest of Walpi on Black Mesa. Shrine, etc. Ritual water, spruce, white clay. Badger clan sipapu (important ceremonial entrance to underworld), here. (1158)

26. Kókyañba - Spider spring, west side under Tewa village, shrine. (1158)

27. Kowa'waimovi - shrine, etc. on ledge under Dawn cape, east face of cliff, 100 feet below summit, about half way between Dawn cape and Sochomovi. (1159)

28. Kuchaptuvela - former Walpi site on southwest terrace below Walpi on west side, opposite highest southwest point of First Mesa. (Map 1) (1159)

29. Kwahabiobi - spring near 19b or between it and Hopi Buttes (Fewkes, 1906, p. 372).

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30. Kwaka'tive - spring for ritual water in east foothills, First Mesa, 3/4 mile from Gap. (1159)

31. Kwa'wa'ba - Sweet spring, 2 1/2 miles southeast from Gap in sand hills; shrine, etc. (1159)

32. Kwapaho'ki - Eagle or Eagle egg shrine, Map 3, on north side of hill known as Tukinobi midway between twin mounts of Wala and Kukutcomo. Nearby is former settlement of Spider clan or Bear people, very old. (See Fewkes, 1906, p. 360.) (1159)

33. Kwa'shtapabi - spring shrine on mesa west side of east mesa, about five miles north of Tewa. Provides ritual water. Horn clan claims to have lived here for a while after coming from northeast and before settling at Hopi, says Stephen. Fewkes gives it as former home of Flute clans. (1159) (Fewkes, 1906, p. 371)

34. Kwuaohki - shrine at Kuya oki, Map 7. (1160)

35. Lakon'abva - bubbling spring shrine of Lalakon society, west of San Francisco Mountains and near them,home of Hail and other angry katcina. (1160)

36. Le'lentikihu - Flute dance house a mile from Kwáshtapobi. (1160)

37. Masau'ki, Ma'skí - Masau houses or shrines at Red cape, also northwest shrine or cairn. (See also Fewkes, 1906, p. 353.) (1160)

38. Mon̄ wiva - Chief spring in east foothills north of Gap 1/2 mile on east side. Ritual and other water taken from here. Dedicated to Hano Plumed Serpent. (1160) (See also Fewkes, 1906, pp. 353-354, 372.)

39. Nakopan - a shrine pictograph about 2 miles north of old Sikyatki (Fewkes, 1906, pp. 363-364), War god shrine. Says Fewkes, "Near this pictograph two Hopi men were killed by the Navaho in comparatively recent times."

40. Navochiyupi - exorcising place on west side of Dawn cape. (1161)

41. Niman katcina shrine near Butterfly shrine. (1161)

42. Numupa - spring at entrance to Keams Canyon. (Fewkes, 1906, p. 373)

43. Nuva tikyou - San Francisco Mts. - certain katcina live here, sipapu to underworld for katcina. Some Hopi used to live here and a monster eagle devoured their children. (This is same as Navaho legend.) (1161)

44. Palatuyuka - Red cape, southeast point of First Mesa. Eagle graves here, shrine below. (1162)

45. Pamyuka - spring on west side of Second Mesa, shrine. (1162)

46. Patni (Water Jar) - Shrine for Niman katcina at extreme southwest point of First Mesa. Map 6. (1162)

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47 Pisaba, Leńaba, Tetuiba, and Tcubpa - springs near Old Awatobi. (Fewkes, 1906, p. 373)

48 Puhtabñwu - shrine northeast of the Break. (1163)

49. Puhuba - spring shrine on west side of West Valley opposite Tewa. (1163)

50 Pupshe - shrine 4 miles from First Mesa in northeastern range. Various ritual material from here. Sun shrine is east from here. (1163)

51. Puukonki - War god shrine below Red cape. (1164)

52. Shoyalki - shrine rock below southwest point of First Mesa. (1164)

53. Shushtuban tukwi - the southwesternmost mountain, 15 to 20 miles from Walpi, southwest of Kaibito. Novices at Wuwuchum taken there. Red ochre collected in nearby hills. Maps 8, 9. (1164)

54. Sichomovi shrine, northeast of pueblo near cliff edge. (1164)

55. Sikya'o'chomo - Yellow Rock mound. Ruins here south of Coyote spring, formerly briefly occupied by Tewa but not built by them. (1164) Shrine. (See also Fewkes, 1906, p. 358.)

56. Sikyatkwe - Kokop clan shrine at Sikyatki ruin 2 miles north of Gap. The old spring of Sikyatki pueblo.

57. Sipi - spring near Hopi Butte where Patki and other southern people stopped on way north from Homolovi or other settlements along Little Colorado. Used by Kwakwantu society for initiation. Water taken for their other ceremonies. This is a society from the south. (Fewkes, 1906, p. 372.)

58. Soyokwuhtiki - shrine on broad terrace under the Break. (1165)

59. Sowinakabu - Rabbit ear shrine just below terrace at side of trail from Walpi to Tawapa. (Fewkes, 1906, p. 369)

60. Suvwiptuyuka - fourth cape or terrace of the southeast point below Walpi, with burials and Apache scalps in crevices. (1165)

61. Tahóki - snake shrine at rock below southwest point of First Mesa. (1165)

62. Tala tumsi kihu - shrine of Earth or Dawn woman in rocks southeast of and below Walpi. (1165) (See Fewkes, 1906, pp. 35, 352.)

63. Tiwapontunsi - shrine of Earth Woman near ruin of Kisakobi (Old Walpi). Offerings over entire ruin at solstice ceremony. (See Fewkes, 1906, p. 352.)

64. Dawn cliff or cape - northeast corner of rock stratum halfway between Sichomovi and Walpi. Shrine and ceremonial spot.

65. Tatacpa - spring near coffin-shaped butte southeast of Walpi. (Fewkes, 1906, p. 373)

66. Tawakiata - sun shrine at Sichomovi east of Pupshe. (1166)

67. Tawapa - Sun spring in foothills 1/2 mile east of Walpi where Patki people coming up from south demonstrated their ceremonies to Walpi people to prove what they could contribute if permitted to join the pueblo. Lakone and Kwankwanu shrines and ritual center. Home of Plumed Serpent of Walpi. To right of road to Towapa is shrine of the Koyenshi clown supernaturals, a cult brought to Hopi from the south, probably one of ruins on Little Colorado. Zuni may have obtained their cult from same source. (1166) (Fewkes, 1906, pp. 365, 372.)

68. Tihkuyi - shrine. Map 5. (1166)

69. Tihkuyiki - shrine below Sakaovi. Maps 1, 5, 6. (1166)

70. Tovovepa - shrine spring at entrance to Keams Canyon. (Fewkes, 1906, p. 373)

71. Toko'nabi - Navaho Mountain associated with Snake clan, bounds their eagle territory, ancient kivas of Snake and Antelope societies here, early home of this group of Hopi. Snake, Sand, Laguna, and Akokabi clans all from here, and Puma and Dove clans lived here. (1166)

72. Tohkuku - animal footprint shrine on trail from Wala to the two mounds of Kukutcomo. (See Fewkes, 1906, pp. 359-360.)

73. Toho - a pictograph representing outline of a mountain lion several feet long, on terrace below Sichomovi. Offerings are placed in a depression representing the heart and at base of the rock. (Fewkes, 1906, p. 364)

74. Tukinovi - Spider Woman shrines on large natural mound 3/4 mile north of Tewa. Also a cave where images of Plumed Serpents used in ceremonials formerly kept. (1167) (See Fewkes, 1906, p. 355.)

75. Tuma - beyond Hukyatuwi in northeastern range, source of white pigment for katcina, home of Antelope supernatural. (1167)

76. Tuveskya - spring shrine on west side of First Mesa. (1167)

77. Tuwu bontumsiki - shrine southeast of early site of Walpi. (1167)

78. Tuwanashabi - "Sand Center" - shrine on edge of southwest sand dunes 1/2 mile south from Walpi. This shrine bears name of traditional ancestral Walpi pueblo west of Oraibi. The shrine is to a sky supernatural similar to that of Christian concept and prayer offerings at this shrine sometimes are spoken of to white as "Jesus pahos." (1167) (Fewkes, 1906, p. 367)

79. Ushtuikabi - spring shrine in valley southeast of First Mesa. (1167)

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80. Wala - The Gap, the great break in First Mesa north of Tewa. Shrine, etc. (1168) (See also Fewkes, 1906, p. 359.)

81. Wĩnava - Standing Water, spring shrine beyond Sikyatki in east valley. (1168)

82. Wipho - 5 springs in west valley about 3 miles north of Walpi, shrine, peach orchards, cotton growing, etc. Only a short distance north of Kanelba. Ruins of houses and terraced gardens. (1168) (See Fewkes, 1906, p. 371.)

83. Yovotki - Scalp house shrine, crevice on 4th terrace of southwest point of First Mesa. (1169)

84. Wĩnpa - dry spring a few miles north of Sikyatki near ruin once occupied by the katcina people. Shrine. (Fewkes, 1906, p. 371.)

VI

HOPI ARCHAEOLOGY AS KNOWN TODAY

White people often are sincerely puzzled by the equally sincere claims of the Hopi to ownership of widely extended territory in the Southwest. Hopi culture has been based upon a sedentary agricultural type of life since at least the first century or so after Christ. What, then, can be the basis of their claim -- a claim which has been repeated to various authorities under various circumstances ever since whites have been around to hear the contentions?

Briefly, one basis for the thinking of these tribesmen is that they have not always been a homogeneous unit: at various times in the past, large and small groups have come to join the Hopi nucleus. Although the original homes of these emigrating peoples are not claimed, the various pueblos which legend (supported by archaeology) indicates were occupied shortly before the newcomers moved into the Hopi-Jeddito area are claimed. Moreover, in many cases the area of such pueblo ruins has continued to be used for turtle and eagle hunting, shrines, etc., by the specific clans which came from those sites. In other cases such lands simply have been generally used by the Hopi in their hunting and gathering activities, if not in farming. The Hopi have been generous in accepting many peoples, drought-ridden or otherwise, in such distress that they were forced to abandon their old homes, a very serious matter to Pueblo peoples because of their characteristic deep religious as well as emotional ties to the homes of their ancestors. The Hopi mesas were blessed with springs and a type of terrain which could support agriculture during periods when other areas failed, but the Hopi themselves also suffered droughts, sometimes to such an extent that the tribe almost disappeared, even though they long had followed

the custom of keeping one year's supply of foods hidden away to tide them over a single crop disaster.

The sympathies of the Hopi did not prevent their making a reasonable demand upon groups who asked to become a part of their tribe: the newcomers were requested to illustrate whatever special abilities they might have which would contribute to the good of the whole. Such abilities usually were thought of in terms of magic and religious ceremonies, and after demonstration of their powers, the in-coming unit was accepted with the understanding that from that time on it would be responsible for exercising those special abilities, as well as cooperating with the original members of the tribe they were joining. It is recorded in legend that some groups whose fame in certain lines was widely recognized were specifically asked by the Hopis to join them. Although the Hopi reputation for being peaceful appears just, in that they seem to have emphasized peacefulness and placidity more than any of the other Pueblos, difficulties between the various Hopi villages and between factions within a single village at times have risen. Where explosions have occurred, however, the split never has broken the tribe, as such, even though villages have been wiped out except for those women and children which were distributed among the attacking villages. These brief civil wars have been seen by the natives (as in all civil wars) as necessary excisions of certain malificent situations, for the good of the whole. But the lands formerly belonging to annihilated villages always have remained Hopi, and it is easy to see why the tribe should think in possessive terms of the former holdings of units which earlier joined the tribe and carried the culture but did not live right in the Hopi mesa area. This poses a problem of definition of Hopi culture as such, for there was a period in time and space when a unit which was to become a part of the Hopi

tribe was not yet Hopi but something else, and then there was a period when it had become Hopi - on the basis of that unit and the other Hopi carrying the same culture, even though there might be a distance of miles between the various Hopi pueblos. Similarity of culture has marked tribalism in the Southwestern pueblos for as long as is recorded in known history; to do things as one's tribe does them is to fit with the in-group, and to make pottery like that of another tribe, or to otherwise copy another group is to be not only "odd" but so traitorous that in the modern period, for instance, attempts have been made to cast a potter out of a tribe into which she had married, only because she tried to continue making the pottery of her home group.

We are left, then, with archaeology as a check on clan legends of earlier homes of the various peoples which became Hopi, and archaeology and dendrochronology can also provide something of the time element of occupation of the various spots. Ethnology must fill in the data on which such areas have continued to be used by the Hopi.

Colton has defined five branches of culture found in Northern Arizona, of which one, the Kayenta, covers both the Kayenta and the Hopi areas (Colton, H.S., Prehistoric Culture Units and their Relationships in Northern Arizona, Mus. Northern Ariz., Bull. 17, 1939) up through Pueblo I state. But in Pueblo II the Hopi and the Kayenta areas begin to differ from each other.

> Until about 900 A.D., north of the Little Colorado River the Anasazi in northern Arizona seemed to have had a more or less uniform culture, Kayenta Branch. Then, on the basis of ceramics, we can note a distinction between the Kayenta Branch in the Moenkopi drainage system and another branch occupying the region of Black Mesa where the Hopi now dwell. We will call this branch the Tusayan Branch. From 900 A.D. until about 1250 A.D. the Tusayan Branch had an existence little affected by their neighbors. About 1300, the people

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> of the Tusayan Branch seemed to have been joined by people of the Kayenta Branch and a little later by those of the Winslow Branch. Out of the union of these three branches and perhaps some others the modern Hopi tribe seems to have its origin (Op. cit., p. 61).

The "branch" is known through a series of "foci," or stages of culture distinct in characteristics and occupying a nitch in time or space. Pottery, which could and did vary through time and space, was consistent for a given time and area, and because of this and because the sherds littering the surface of a site are easily available data, pottery types are used by archaeologists more than any other single trait in distinguishing foci. Pottery types succeeded each other within an area by recognizable stages of development, and are considered as successive examples which have stemmed from one ware (consistant in type of clay, method of manufacture, method of firing, color, etc.). Colton explains the concept of index ware as used by all Southwestern archaeologists:

> The index ware is important in synthesis because in many cases it gives a clue to the branch or prehistoric tribe of Indians to which the makers belonged. The Index Ware is defined as a pottery ware including a number of more or less similar types used for cooking and storage and which are peculiar to a certain prehistoric tribe. (Colton, H.S., Potsherds, Mus. of Northern Ariz., 25, 1953, p. 67.)

Through the study of the wares and comparison of the types within the ware, period by period, supplemented by comparison of other traits, one can trace relationships of peoples, migrations, trade, etc. Basic to the whole concept, of course, is the ultra-conservatism of the Pueblo peoples. Hopi yellow ware, the most beautiful ever made in the Southwest, according to many, can be traced back through a series of types beginning in 1250 A.D. and at that date it began to supplant a series of Black on White, Black on Red, and Polychrome wares which characterized the Hopi area during earlier

periods. The sequence of ancestral Hopi pottery, going back to 600 A.D. (Ibid., p. 75) has been worked out in some detail:

		STAGE	APPROX. DATES
(1) Kayenta-Hopi Sequence (gray and white types)			
Tusayan Gray Ware	Lino Black-on-gray	BM III	600-700 A.D.
	Kana-a Black-on-white	P I	700-900
	Black Mesa Black-on-white	P II	900-1100
	Sosi Black-on-white (Syn. Kiako B/W)	P II L, P III E	1070-1150
	Dogozhi Black-on-white	P II L, P III E	1070-1150
Tusayan White Ware	Flagstaff Black-on-white	P III E	1120-1225
	Polacca Black-on-white	P III E	1120-1225
	Wupatki Black-on-white	P III L	1200-1275
	Kayenta Black-on-white	P III L	1250-1300
	Jeddito Black-on-white	P III L, P IV E	1275-1350
	Hoyapi Black-on-white	P III L, P IV E	1275-1350
(2) Kayenta-Hopi Sequence (red and buff types)			
San Juan Red Ware	Deadmans Black-on-red	P I, P II E	800-1060
	Tusayan Black-on-red	P II L, P III E	1050-1130
	Citadel Polychrome	P III E	1075-1175
San Juan Orange Ware	Tusayan Polychrome	P III M-L	1150-1275
	Kayenta Polychrome	P III L	1250-1300
	Kiet Siel Polychrome	P III L	1250-1300
	Jeddito Black-on-orange	P III L	1250-1300
Jeddito Yellow Ware	Jeddito Black-on-yellow	P IV	1300-1625
	Sikyatki Polychrome		1400-1625

(L indicates Late; E indicates Early)

The archaeologist with a background in Southwestern studies would see in these sequences the background to Colton's statement on the prehistory of the Hopi and could enlarge that statement somewhat.

The people of the Kayenta and Hopi regions both made Lino, Kana-a, and Black Mesa Black on white types, of Tusayan Gray and Tusayan White ware, successively, through the period from 600 to 900 A.D. During the latter part of that period, they added a Tusayan Red Ware type, Deadman's black on red.

The area covered extended from a little south of Holbrook and Winslow to beyond the state line on the north and from the Chinle Valley on the east to the Kaibab Plateau on the west. Between Winslow and the Grand Canyon, the line followed was the Valley of the Little Colorado. (Colton, H.S. Prehistoric Culture Units, 1939, Fig. 9.) From that time on, small differences (apparent only to the modern specialist concentrating on distinctions with aid of magnifying glass, etc.), could be noted between the pottery types of the two closely related areas, and trade between the two was common, as indicated by foreign sherds associated with the natively made sherds of each area. In other words, all types given in the two lists above are closely related to each other, and derivative from one another, but some had their home in the Hopi area and some in the Tsegi or Kayenta area (See Colton, H.S., and Lyndon L. Hargrave, Handbook of Northern Arizona Pottery Wares, Mus. of Northern Ariz., Bull. 11, 1937).

In 1939 Colton outlined a series of focii representing development through time in northern Arizona, giving most detail for the Kayenta Branch, the best known. "From this branch sprang the Tusayan 1/ Branch in the Hopi Country, which may carry it on to the present time in the modern Hopi,

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1/ The word "Tusayan," probably of Zuni origin, always has referred to the Hopi country (Op.cit., pp. xxii, xxiii). Hodge in 1916 gave as possible source for the term the Navaho Tasaun or zilh Tusaun, which he defined as "the country of isolated buttes," (Hodge, F.W., Benavides Memorial of 1630, 1916, p. 257, notes). But in the next year the American Anthropologist carried a note quoting from "a recent letter to Mr. F. W. Hodge" by Father Berard, OFM, then of St. Isabel's Lukachukai, Arizona, and more recently of St. Michaels, who speaks and writes Navaho fluently, in which he explains that the Navaho terms Tasaun and zilk Tasaun do not refer to the country of isolated buttes or to any type of topography, but to a lone mountain at the Mouth of the Grand Canyon in the Supai district, and that in referring to the Tusayan area the Navahos use a word meaning "people living in houses you enter from above", which, of course, is the typical Hopi structure with roof hatchway, used up to the post-Ft. Sumner period. ("The Meaning of 'Tusayan'", American Anthropologist, Vol. 19, 1917, p. 151.)

fourteen hundred years in all." (Colton, 1939, p. 52.) By 1956 Colton had become convinced that the Kayenta and Tusayan branches were one: "I am proposing here to drop the name Tusayan Branch and combine the foci of the Kayenta and Tusayan into a single Kayenta Branch. The Kiako, Polacca and Huckovi Foci show a slight regional difference from the more northern Foci, Black Mesa, Klethla, and Tsegi, but the difference is not sufficient to set up a branch." (Colton, H.S., Pottery Types of the Southwest, Museum of Northern Arizona, Ceramic Series No. 3C, 1956.) His map showing areas covered by the various "branches" in northern Arizona (Colton, H.S. The Sinagua, Museum of Northern Arizona, Bull. 22, 1946, p. 15, Fig. 3) shows this Kayenta Branch extending from the edge of southern Utah to just south of the Little Colorado in the Winslow area and from the upper drainage of the Little Colorado west of Winslow and so to where it joins the Colorado. In the northwest the area stretches beyond the west banks of the Colorado itself. To the east, the area extends to the Chinle Valley.

We shall briefly summarize his data, as known in 1939 and checked by later studies, on the successive focii in the Hopi area:

Kioko Focus (900-1100 A.D.): Black Mesa and Hopi washes of northeastern Arizona; one excavated site, 38 important unexcavated sites (1939); indigenous types - Kioko Black on White and Tusayan Corrugated; associated (trade) types from Kayenta and Holbrook areas; D-shaped masonry pit houses and small surface graneries (Colton, 1939, p. 61). Comparable to the Black Mesa focus (P II) farther north.

Polacca Focus (1100-1200 A.D.): south half of Black Mesa and the Hopi washes; two excavated sites and 35 unexcavated (1939); indigenous types - Polacca Black on White, Oraibi Black on White, and Tusayan

Corrugated; associated wares from surrounding area; small masonry pueblos with D-shaped kivas; flexed inhumations (Ibid., pp. 61-62). Comparable to the Black Mesa focus (P II) farther north.

Hukovi Focus (1200-1300 A.D.): "Northeastern Arizona about the Hopi Mesas"; no excavated sites; eight unexcavated (1939); indigenous types - Jeddito Black on Orange and Tusayan Corrugated; associated types from Kayenta area to the north and Little Colorado area to the south; masonry pueblos with D-shaped and rectangular kivas; three quarter grooved axe (a southern trait); flexed inhumation (Ibid., p. 62). Comparable to the Tsegi Focus (P III) farther north.

Jeddito Focus (1300-1400 A.D.): "Northeastern Arizona on and about the Hopi mesas"; excavated sites -- Awatovi (Brew), Kokopnyama (partial, Hargrave); dated site, Chakpahu, 1377-1390 ±; 11 unexcavated sites including Old Oraibi, Old Mishongnovi, Kuchaptuevela, Chukovi, Kawaioku, Chakpahu, Nesheptanga, and Kokopnyama; indigenous types - Jeddito Black on Yellow, Bidahoochee Polychrome, "other unnamed polychromes" and Jeddito Plain and corrugated; associated Zuni Glaze wares; large masonry pueblos with rectangular kivas of the Hopi type; three quarter grooved axes; inhumation flexed, and extended (?). Remarks: "This Focus seems to represent the fusion of the Tsegi Focus of the Kayenta Branch with the Tusayan Branch. It also includes many southern traits." (Ibid., p. 63.) This is the P IV focus of the Kayenta Branch as given in 1946; the old area to the north had been vacated; the people and their culture, with additions from emigrating bands, lived on at Hopi.

Sikyatki Focus (1400-1600 A.D.): "Northeastern Arizona and about the Hopi mesas"; excavated sites - Sikyatki (Fewkes), and Awatovi (Brew); six unexcavated sites including Old Oraibi, Shungopovi, Chukovi, Mishongnovi,

Kuchaptuvela, and Kokopnyama; indigenous types - Jeddito Black on Yellow, Sikyatki Polychrome, and Jeddito Plain and corrugated; associated Zuni glazes; large masonry pueblos with rectangular Hopi type kivas; three quarter grooved axes; inhumation flexed and extended (Ibid., pp. 63-64).

San Bernardino Focus (1600-1700): "Northeastern Arizona, Hopi Mesas ; excavated site - Awatovi (Brew); four unexcavated sites including Kisakovi, Mishongnovi, Shungopovi, and Old Oraibi; indigenous types - Jeddito Black on Yellow, San Bernardino Polychrome, and Jeddito Plain; associated Zuni glaze wares, Mexican and Spanish majolicas (from mission); large masonry pueblos with rectangular Hopi type kivas, European metal tools; flexed inhumation and extended Christian burials; named for Hopi mission of San Bernardino (San Bernardo) at Awatovi (Ibid., pp. 64-65).

Payupki Focus (1700-1800 A.D.): "Hopi mesas on the southwest end of Black Mesa"; excavated site - Payupki (partially); unexcavated sites - "Payupki components exist at Oraibi, Walpi, New Shungopovi, Shipaulovi, New Mishongnovi; indigenous types - Payupki Polychrome and Jeddito Plain; associated European pottery, china, glass beads; large masonry pueblos with rectangular Hopi type kivas; Named for the historic abandoned Hopi pueblo of Payupki, Navajo County, Arizona" (Ibid., p. 65).

Oraibi Focus (1800-1900 A.D.): "Hopi mesas on the southwest end of Black Mesa ; excavated sites - none; seven unexcavated sites, including "Oraibi, Shungopovi, Shipaulovi, Mishongnovi, Walpi, Sichomovi, and perhaps Hano"; indigenous types - Polacca Polychrome and Jeddito Plain; associated European pottery, china and glass beads; large masonry pueblo with rectangular kivas, metal tools for agriculture and metal cooking vessels; inhumation flexed with rare exception (Ibid., pp. 65-66).

Walpi Focus (1900 -): Modern Hopi (Colton, op. cit., 1956).

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This provides a bare outline of Hopi history: the people of the Hopi area were making black on white ware through 1200 A.D. but were receiving colored as well as black on white trade wares; between 1200 and 1300 A.D., they had considerable trade ware from the Little Colorado (around Holbrook-Winslow and south in the White Mountains) and had acquired the concept of the three quarter grooved axe, a very typical southern trait. At the end of this century, during the period of the twenty-three year "Great Drought" of 1276-1299, when the entire Kayenta, Flagstaff, and Mesa Verde areas were abandoned, as well as large areas elsewhere to the south, the people of the Tsegi moved in with their Hopi relatives and so did groups from the Little Colorado (Holbrook-Winslow) where water was less available than in the Hopi Mesa-Jeddito country (dry as the latter area appears). Pueblos were much larger than previously, and near remaining water sources. This drought and the following megacycle of erosion affected most of the Southwest, although not all equally, and the trek of survivors to the few best watered areas were responsible for a tremendous dissemination of traits and development of new pottery types. The groups which came to the Hopi area from the Little Colorado and farther south in the White Mountains brought the concept of use of an oxidizing atmosphere for firing pottery, resulting in the development of the famous Jeddito Yellow and its various polychrome descendants. This is the first type which we usually think of as specifically and very characteristically "Hopi", although the same clay had been utilized earlier, with a reducing firing atmosphere, in making the local black on white types. These later were decorated with geometric designs, whereas the new and gorgeous yellow ware was decorated with conventionalized bird, insect, and occasional animal or human designs,

as well as with the more common motifs. The backgound to the new designs seems to have been some of the polychrome red wares fired in oxidizing atmosphere of the Little Colorado-White Mountain area. In other words, in this Jeddito Yellow pottery we have strong indication of influence from southerners moving into the Hopi country and influencing the Tsegi-Hopi combination of peoples there. Trade or influx from the Zuni area is suggested by the associated Zuni glaze wares in this Jeddito Focus and the following Sikyatki focus. The Jeddito yellow ware was traded into the Verde Valley, the Salado, north of the Grand Canyon, and into New Mexico; it seems to have been the major item which the Hopi could offer in their trade with natives bringing feathers, shells, cotton cloth, turquoise, etc., from all directions (Colton, 1960, p. 89).

The Spaniards, who had visited the Hopi but briefly in 1540, returned to establish missions in the 17th century. The missionaries were killed when the Hopi joined the general Pueblo Revolt of 1680. In the difficult times stemming from drought years, actual Spanish reprisals, and fears of reprisals after the reconquest by De Vargas in 1692 and intermittent successive Pueblo uprisings, a number of Rio Grande groups came to join the Hopi for longer or shorter periods. (Some, according to legend, had come even earlier.) This period also saw the beginning of Navaho incursions into Hopi territory, for the Navaho, greatly expanded in strength by the addition of large numbers of Pueblos, especially Jemez, who left their home territory and joined their somewhat more nomadic neighbors during this period of drought and Spanish reprisals, were seeking agricultural territory beyond the reach of Spanish and semi-allied Ute pressures. That the Navaho did some trading with the Hopi at this time is indicated by the presence

of Hopi Jeddito yellow sherds in the materials from the large Navaho site at Big Bead Mesa on the northeastern slopes of the Cebolleta Mountains (see Ellis, F., Report for the Navaho Land Claim) and at sites on the Chacra Mesa, as well as to some extent in sites in the Navaho Reservoir area. The further push of Navaho into territory the Hopi considered to be their own had become real by the second half of the 19th century, although the newcomers do not seem to have lived west of the Keams Canyon area and mesas to the north until after 1858, the period beginning their wild scattered flight in fear at the threats of the United States Government in final answer to their long record of increasing raids and depredations. From the period when the Navahos, returned from their incarceration at Fort Sumner, were moved into the newly formed reservation in territory seemingly too far west to be desired by white settlers, until the present, the Hopi have repeatedly complained about the incursions of Navaho onto their lands, of course, when such incursions involved farming and herding areas, but also when territory considered important as shrine areas or eagle nest areas (where specific clans collected eagles to have feathers for ceremonial purposes, etc.) were involved.

Filling in this outline history of the Hopi with further data is possible on the basis of archaeological and ethnological knowledge.

Colton unhesitatingly places the old sites of the Jeddito drainage with those of the Hopi mesas as directly ancestral to the Hopis of today. Brew, as the result of his more recent studies, does likewise: "One of the most important aspects of the study (of Awatovi and the other Jeddito sites) is the fact that the history so preserved represents an unbroken current of cultural development which is still flowing in the modern Hopi towns and farms." (J. O. Brew, Foreword: Smith, Watson, and Louis Ewing,

Kiva Mural Decorations at Awatovi and Kawaik-a, Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University, Vol. XXXVII, 1952, p. viii.) Brew's comment is based on his five seasons' excavations in the Jeddito area. His detailed summary of the accomplishments of that program (Op. cit., pp. ix, x) covers a number of matters of importance to our present study: 21 sites ranging from the 6th century A.D., to the early part of the 18th century were excavated entirely or in part, 1500 rooms uncovered, 1300 of these being in the large pueblo of Awatovi. On the basis of test pits and dendrochronological dates, the occupation periods of all parts of the site were discovered. The 17th century mission of San Bernardo de Aguatubi, the mural-decorated kivas involved with native religion, 85,000 specimens of pottery, 11,700 other artifacts, and tons of potsherds were studied. Thorough physiographic, geological, and ethnobotanical studies of the area were made. The area surveyed for sites covered Antelope and Roberts Mesas and adjoining area. A glance at his general statements and summaries (data not yet all published) indicates that on the basis of his much larger studies, he agrees with Colton's earlier conclusions.

Antelope Mesa, to the east of the Hopi Mesas, might be called the Fourth Mesa and Roberts Mesa the fifth.

Some of the Basketmaker sites of the Hopi-Jeddito area are of the type found in the more northern Kayenta area, but Brew found others (BM III-P I) Sites 4, 4a, and 264, which showed certain traits of Kayenta type and a few comparable to those of contemporary Mogollon sites along the Mogollon Rim south of the Little Colorado and in the San Francisco Mountain region (Brew, J.O., "Awatovi Expedition of 1939," Plateau, Vol. 13, No. 2, Mus. Northern Ariz., 1941). That there was considerable movement of ideas from the Mogollon to the Anasazi of the north at this time is well known. Basketmaker and P I

sites long have been known for First Mesa Hopi (Hargrave, Lyndon L., "First Mesa," Mus. of Northern Ariz., Mus. Notes, Vol. 3, no. 8, 1931) from their surface sherds, which are similar to those of Jeddito sites.

Evidence increases for occupation from 900 to 1300 A.D. with a greater population and the building of larger structures as the period progresses. Until about 1200 the population increased at a steady rate. P II and P III structures long have been known for First Mesa (Hargrave, op. cit., pp. 1-6). On Antelope and Roberts Mesas, Brew found 83 P II sites and 124 P III sites (Brew, 1941, p. 45), including the west mound section of Awatovi. From 1200 to 1400 A.D., there was a sudden rise in population. Many of the pueblos which continued into historic times were founded during this period. Oraibi, on Third Mesa, had been founded circa 1150 A.D. (Hargrave, op. cit., p. 1) at the very beginning of P III, and Shungopovi was founded before 1250 A.D. (Hargrave, Lyndon L., "Shungopavi", Mus. of Northern Ariz., Mus. Notes, Vol. 2, no. 10, pp. 1-4, 1930).

The Crow clan from the San Francisco Mountain area had settled at Corn Rock at the foot of the Second Mesa, a people who would move onto the top of that mesa some centuries later (Colton, op. cit., 1932).

Fewkes, in attempting to track Hopi ancestry through a combination of legend and archaeology, in 1900 published his conclusion that the group of sites he referred to as "Ruins at Black Falls" were those referred to by the Hopi as Wukoki, where ancestors of their Snake Clan, after leaving their original home near Navaho Mountain, lived for a time on the Little Colorado fifty miles from Hopi, before making the final move to the Hopi mesa country. (Fewkes, "Pueblo Ruins near Flagstaff, Arizona," American Anthropologist, n.s., Vol. 2, pp. 422-450, 1900). (The larger of these ruins, by accident, later was incorrectly given the name of Wupatki

and a smaller site that of Wukaki. These two and six others are now known as the Wupatki National Monument, 40 miles northeast of Flagstaff, near Heiser's Spring: Colton, "Names of Wupatki," Plateau, Vol. 29, no. 1, pp. 22-24, 1956). Colton considers the Wupatki sites to be of Sinagua background, but they were in close touch with the people from farther north and may well have acquired or (less likely) been founded by immigrants from the north who took up Sinagua culture. The site was deserted toward the end of the 13th century.

In the late 1200's a series of migrations into the Hopi-Jeddito area began as the result of the drastic drought of 1276-1299 (Colton, H.S., 1936, op. cit.). In 1895 Fewkes found "Black on White" and "Black on Red" sherds at Awatovi and stated that they probably came from the south (Fewkes, J.W., "Expedition in Arizona in 1895", BAE, AN 17, 1898, p. 607), and Brew reports an influx of Little Colorado polychrome (from the south: Little Colorado area) before the appearance of Jeddito Black on Orange (dated 1275-1400), and at the time when massive houses were just beginning to be built (Brew, J.O., "First Two Seasons at Awatovi," Amer. Antiq., Vol. III, no. 2, 1937, p. 134). The Kayenta or Tsegi region was totally evacuated at the turn of the 13th century, because of the drought, and Colton postulates an earlier and almost total evacuation of the same area some fifty years earlier, in both cases the people settling in the Hopi-Jeddito group. Brew (Op. cit., 1937, p. 134) and Hargrave (Hargrave, Lyndon, "Oraibi", Mus. of Northern Arizona, Mus. Notes, Vol. 4, No. 7, 1932, pp. 27, 28) recognize a mixture of Kayenta and Little Colorado pottery traits in the form and decoration of Jeddito Black on Orange, and Hargrave illustrates some Mesa Verde influence, mingled with Little Colorada and Kayenta influence, on

Jeddito Black on White (Ibid., p. 17). The people of Mesa Verde had deserted their home territory in the drought period; in their scattering some went to New Mexico, and some to White House in Canyon de Chelly, where the pottery is of Mesa Verde type. It is probable that those from Canyon de Chelly moved into the Jeddito country. Brew has found Mesa Verde Black on White and Mesa Verde mug forms in Jeddito sites (Brew, J.O., Archaeology of Alkali Ridge, Southeastern Utah, Papers of Peabody Mus. of Am. Arch. and Eth., Harvard Univ., Vol. XXI, 1946, p. 301) and Hopi tradition.

The Kayenta culture used a square kiva in the late 1200's. The Hopi area people had been using a D-shaped kiva but the square kiva appeared in the Jeddito in the late 1200's, about the time of the major migrations int the district (Colton, H.S., Prehistoric Culture Units and Their Relationship in Northern Arizona, Mus. of North. Ariz., Bull. 17, 1939, p. 62).

The population increase of the late 1200's carried on into the early 1300's. The Jeddito-Hopi area, as we have shown, was blessed with a better water supply than most of the other areas, and the springs and sand dunes must have seemed a haven of refuge to the hard-pressed migrants. In the 14th century the number of sites diminished but the size of each grew. At one time Awatovi alone covered 20 acres (Brew, 1941, p. 46). Brew found 44 sites representing P IV in the Jeddito, one third as many as in the preceding period (Brew, op. cit., p. 45). The top of First Mesa, of the Hopi mesas, was abandoned during the early 1300's (Hargrave, 1931, pp. 1-6) in favor of a site at its base, Kuchaptunela. Oraibi was the only town occupying the top of Third Mesa during the early 14th century (Hargrave, 1932, pp. 1-8); the other Hopi sites were below. Shungopovi still existed on Second Mesa (Hargrave, 1930, pp. 1-4), and Mishongnovi had been settled

at its base (Colton, 1932). By the 1400's the only other occupied Pueblo settlements anywhere in northern Arizona were in the Petrified Forest, in the White Mountains, the Verde Valley, and the Little Colorado near Winslow and Chavez Pass (Colton, 1936). Of these, closest contacts were between the Hopi Mesa-Jeddito area and the Little Colorado group near Winslow.

In 1896 Fewkes and Hough made their special field problem the attempt "to investigate by archaeological methods the claim of the Patki family (Hopi) that their ancestors lived near Winslow and at Chaves Pass." (Fewkes, J.W. "Preliminary Account of an Expedition to the Pueblo Ruins near Winslow, Arizona, in 1896," An. Rept. Smith. Inst., 1896, pp. 517-540.) The Hopi name for the group of ruins near Winslow is Homolobi; as Fewkes uses the term it covers four extensive ruins within 6 miles of Winslow, near the Little Colorado. They were occupied simultaneously. He found that about one third of the pottery from these ruins was of Hopi type; similar to that from Sikyatki, and the other third black and white and red decorated with black glaze. As we now know, this latter type, one of the ancestors of Hopi ware, indicates that these sites are of somewhat earlier period than Sikyatki. The life designs definitely are closely related to those of Hopi, though not identical. While Fewkes and his party were working at Homolovi, a group of Hopi came 80 miles from Hopi to collect turtles from the Little Colorado tributaties so that their shells might be used in a forthcoming dance, to place offerings on shrines there, and to take some of the water of the river back for ceremonial usage. To Fewkes, this was definite proof that this ruin belonged in the Hopi complex, as claimed, a point borne out by Homolovi pottery.

Chevlon Ruin, 15 miles from Winslow where Chevlon Creek joins the Little Colorado, carries the Hopi name Cakwabaiyaki (Blue Stream pueblo). The predominant pottery was more similar to that of old Zuni than to that of Tusayan, thought Fewkes; actually it is of types now recognized to be in the latter part of the series of Little Colorado polychrome (Four Mile Polychrome, etc.), related to Hopi but not quite Hopi, and dating about 1400. Some Hopi trade ware was present. Fewkes made the point that the yellow pottery of Homolovi and Chevlon duplicated that of the Hopi-Jeddito country except for its having a greater percentage of geometric designs, a local variation (Fewkes, F.W., "Two Summers Work in Pueblo Ruins," p. 69, 1904, BAE AR 22). The Chaves Pass sites, a few miles farther to the south, were characterized by a ware new to Fewkes and which we now know as Four Mile Polychrome, a late type in the Little Colorado series, dating about 1400. Although there was much influence in design between this type and the Hopi yellow wares, Four Mile is not a Hopi ware. The Second Mesa Hopi refer to this ruin as Topachovi (Colton, 1946, p. 71), from which some of their people came when the site was deserted.

In 1901 Hough investigated a number of ruins along the Little Colorado, and north into Tusayan. He was especially interested in those which he thought gave indication of relationship to the prehistoric Hopi. Stone Axe ruin, 70 miles east of Homolobi, "a group of Hopi ruins near Winslow, explored by Dr. Fewkes and the writer in 1896" and 50 miles southeast of "the new group of Hopi ruins near Biddahoochee, which were discovered by the writer during the autumn of 1901," was characterized by about fifty percent of its pottery being of Jeddito Black on Yellow. "The pottery of this ruin . . . gives the most important indication that the former inhabitants of Stone Axe were related to the Hopi," says Mr. Hough (Hough,

Walter, "Archaeological Field Work in Northeastern Arizona. The Museum-Gates Expedition of 1901", Smith. Ann. Rpt., Rept. of National Museum, 1901, p. 322). Stone Axe ruin was so far east that Hough had not expected to find evidence of Hopi ancestry here, and at present it is thought that this site was not Hopi but was involved in very heavy trade relations with the Hopi.

Hough believed that people moved from Stone Axe ruin to Biddahoochee, a Hopi site, by way of Carrizo Creek and the Little Colorado, which enters the Little Colorado a few miles west of Holbrook. By going up the Carrizo one may reach Le Roux Valley and travel on to Cottonwood Wash, 8 miles southeast of Bidahoochee. These washes have important branches among the Hopi Buttes on the 6,000 ft. contour. Many sites in the area have been pothunted and the vessels sold in Holbrook, and as much of this pottery was of Jeddito Yellow, Hough went into these drainages to examine what sites he might discover. At the head of a small narrow canyon running north to the Cottonwood, he examined a fairly large ruin where the sherds were mostly of yellow ware, though Zuni glazes also were present. The site thus should date in the 1400's. A large ruin on a bluff on Cottonwood Washes "near where the Holbrook road crosses," showed pottery of the same type (Op. cit., p. 327). "Some few miles down the wash, on the southeast front of a large butte," he found two ruins showing the old Hopi ware (Op. cit., p. 328).

Hough then went up into the "Jettyto" valley where he visited the well known ruins of which plans have been drawn by Victor Mindeleff (Mindeleff, op cit.). Hough comments that Mindeleff's "'Mishiptonga' is Kawaiokuh; 'Bat House' is Chakpahu; 'Horn House' is Kokopnyama wrongly located; 'a small ruin between Horn House and Bat House' is Nesheptanga.

The ruin south of Kokopnyama, called Lululongturqui is not described." (Hough, op. cit., p. 333.) Hough made excavations at Kokopnyama, of which he explains that the Hopi name means "Firewood people" and presumably refers to the original inhabitants, but that the Navaho name is "place of the wild gourds," and the name by which the site was known to Americans was "Cottonwood ruin" (Op. cit., p. 333). Portions of this large ruin were four stories high.

Hough did some work at Nesheptanga (Mindeleff's "small ruin between Horn House and Bat House"), a fair-sized ruin near Kokopnyama. Lululongturqui, across the valley from Kokopnyama, he notes as being of medium size and associated with many oblong garden plots bounded with lines of stones, Hopi style. Most of the pottery here he reports as gray and light red, but there was a fair proportion of the yellow, indicating (as we know today) a date probably in the late 1200's. The ruin of Chakpahu (which Mooney had incorrectly referred to as Kawaika, a site which lies a short distance to the west of the Keams Canyon road) is said to have the best of the yellow ware to be found in Tusayan (Op. cit., pp. 336, 337). Kawaika itself is a large ruin, several stories high, with typical old Hopi pottery.

The large Jeddito pueblos of Awatobi, Kawaika-a, Chakpahu, Kokopnyama, and Lulungturque (noting the sites from west to east), and the two smaller pueblos known as Pink Arrow and Nesuftanga near the Jeddito Trading Post, lie along the southern edge of Antelope Mesa and just to the north of Jeddito Wash. Awatovi was occupied during Pueblo III, Pueblo IV, and part of Pueblo V times. All the others, except one, were occupied in P III and P IV. Lulungturque is a P III site. It is interesting to note

that all of the P IV pueblos here burned coal in heating their houses and in firing pottery. Hack estimates that at least 100,000 tons of soft coal dug from nearby seams was burned in the Jeddito region between the 13th century when its use began and (the century in which the English also began using coal for fuel) the 17th century when it was dropped, possibly because deposits near the surface were exhausted or because burros introduced by the Spaniards made it easier to bring firewood from a distance than to mine the decreasing deposits (Hack, John T., Prehistoric Coal Mining in the Jeddito Valley, Arizona, Papers of the Peabody Mus. of Am. Arch. and Eth., Harvard Univ., Vol. XXXV, no. 2, 1942). Earlier sites excavated by the Peabody expedition cover representatives of BM III, P I, P II, and P III.

Hough and Fewkes were convinced that at least some of the pueblos along the Little Colorado were ancestral Hopi, representing stopping places of various groups who eventually were to concentrate in the Hopi Mesa-Jeddito area. The two men referred to pottery designs and other archaeological features as evidence that the people of these Little Colorado pueblos had come from farther south, a point which coincided with Hopi legends collected by Stephen and Mindeleff (Op. cit.) and by Fewkes, Mindeleff, Voth, Stephen and others recounting the movement of certain clans from the "Red South," apparently the Salt-Gila drainage. (This point still is accepted today.) The Little Colorado, however, was the line which these men considered to southern recognizable limits of Hopi culture as such.

Between 1400 and 1540, at least some of the people who had moved into the Verde Valley, Chavez Pass and ~~from~~ the Winslow area from the Flagstaff area earlier, left for Hopi and Zuni (Fewkes, 1898, p. 650; Colton, 1939, p. 22).

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The most efficient method of outlining the Hopi occupation area for successive periods, as known today, is through a resumé of the successive and related types and their range. (For full description of types, see Colton, H.S., Pottery Types of the Southwest, Museum of Northern Arizona Ceramic Series, No. 3C, 1956.) The types with which we are concerned are shown in Chart, pp. 7, 29, grouped under the larger headings of "Wares" (of which the types are specific developments), and in columns representing their respective areas of occurrence.

For the Hopi-Jeddito area, the Awatobi yellow ware has been the utility pottery from about 1300 to the present time. As Colton explains, "The forms grew out of the gray corrugated and plain utility pottery of the Kayenta Branch in the thirteenth century; pottery types such as Tusayan Corrugated and Kiet Siel Gray. The major change in technique was a shift from a reducing firing atmosphere to an oxidizing one." Two of the decorated types associated with that gray utility pottery were Jeddito Black on Orange and Jeddito Polychrome, developments of the Tsegi Orange Ware of the Kayenta Branch, indigenous in the Rainbow Plateau area and Hopi country. The Jeddito Black on Orange and Polychrome are classed as "Early Hopi"; they are found in the Jeddito, Polacca, Wepo and Oraibi drainages and also on the Little Colorado near Winslow and on Clear Creek, Navajo County, Arizona. Under "Comparisons" for Jeddito Black on Orange, Colton notes that this type is similar to Tuwiuca Black on Orange in style of design but differs in temper. The Tuwiuca found in the middle Little Colorado valley near Winslow, is described as being not only similar to Jeddito Black on Orange but as reflecting "the same characters of form and style of design as occur at other late Pueblo III or early Pueblo IV sites of the general region on the plateau, north and southwest of the Little Colorado

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In other words, the Jeddito and its close relative from Winslow, can not be distinguished from each other without use of a magnifying glass, and both are very similar, except in clay, to others spread over some distance. Their small difference from each other is enough to be used by specialists as distinguishing characteristics, but the intention of the makers obviously was to produce identical pottery.

The pottery types associated with the Jeddito Plain, Corrugated, and Tooled in the Hopi country comprise a series, all of which fall under the heading of Jeddito Yellow Ware. Colton gives its backgound:

> Probably no ware of Pueblo Pottery is admired as much as is Jeddito Yellow Ware. Not only are vessels of this ware conspicuous for beauty of form and for elaborate designs, but probably are admired as much for the clear, bright yellow tones of the vessel surface. Hargrave (1935, p.20) has suggested that the vessels of gold that lured the early Spanish explorers into the Southwest, easily could have been pottery vessels of Jeddito Yellow Ware that were commonly traded throughout the Southwest. To natives who did not refine metals, "gold" might refer to color.
>
> The ware developed late. Its appearance does not mark a great change or special advancement in techniques since early examples of this ware do not differ greatly in form or finish from vessels made long before. The same materials used in manufacturing vessels of Awatobi Yellow and Jeddito Yellow wares were used in vessels of the earlier orange, gray, and white wares of the same region. Where vessels once were white or orange, later they were shades of yellow [from difference in control of atmosphere of firing]. The chief ceramic change was in the black paints; a shift from manganese and carbon to iron and carbon.

The Jeddito Yellow Ware, begun about 1250, has continued to the present. Its range is the southern part of the Hopi Indian Reservation. More than one type of pottery within this ware was made at a time, the differences in some cases being a matter of slight specialization by district, even as is seen in the different pottery types, Walpi, Sishomovi, and Hano polychrome, being produced by residents of the three villages on First Mesa today. (See chart.) [See Colton, 1956, p. 3, and specific pottery type descriptions

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HOPI | SOUTHERN EXTENSION OF HOPI | WINSLOW SUB-BRANCH

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Sichomovi Red Ware

Sichomovi B/R (20th cent.)
Sichomovi Polychrome (20th cent.)

Jeddito Yellow Ware

Hano Poly. (1896-present)
Walpi Poly. (1886-present)
Polacca Poly. (1800-1900)
Payupki Poly. (1700-1800)
San Bernardo Poly. (1630-1700)
Kawaikuh Poly. (1450-1625)
Awatobi Poly. (1400-1625)
Sikyathi Poly. (1400-1625)
Jeddito Engraved (1350-1600)
Jeddito Stippled (1350-1600)
Jeddito B/Y (1325-1400)
Bidahochi Poly. (1320-1400)
Kahop B/O (1250-1325
Kahop Poly. (1250-1325)
Huchovi B/O (1275-1325)
Huckovi Poly. (1275-1325)

Awatobi Yellow

Jeddito Tooled (1300-present)
Jeddito Plain (1300-present)
Jeddito Corr. (1300-1400)

Homolovi Orange - Winslow Sub-Branch

Homolovi Plain (1300-1400)
Homolovi Corr. (1300-1425)

Winslow Orange Ware

Black Axe Poly. (1300-1400)
Homolovi Poly. (1300-1400)
Black Axe Plain (1250-1400)
Chavez Pass Poly. (1300-1400)
Chavez Pass B/R (1300-1400)
Homolovi Poly. (1300-1400)

Tsegi Orange Ware

Jeddito Poly. (1250-1300)
Jeddito B/O (1200-1300)

Tsegi Orange

Kintiel Poly. (1250-1300)
Kintiel B/O (1275-1300)
Klagetah Poly.) ca.
Klagetah B/Y) 1250

Tuwiuca B/O (1250-1300)
Tuwiuca Orange (1250-1300)

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During the 13th century when Jeddito Black on Orange and Polychrome, representatives of the Tsegi Orange Ware, were being made in the Hopi Reservation country, four other types of Tsegi Orange Ware were being made a bit farther to the south. These are Klagetah Black on Yellow and Polychrome and Kintiel Black on Orange and Polychrome. The type site for the second pair is Kintiel Pueblo on Leroux Wash. Colton marks the four as "A southern extension of Hopi." These pottery types are so similar to those from the more northern Hopi area that they frequently are mistaken for them. The range of the two Klagetah types is the Rio Puerco and its northern tributaries; that of the two Kintiel types is the Leroux Wash and the Rio Puerco Wash.

In the Winslow area the two Tuwiuca types of this same period, representing the Homolovi Focus, were followed by a series of other types which also sprang from Winslow Orange Ware. The accompanying plain wares are considered to belong to the sub-branch of Homolovi Orange. Homolovi Polychrome, Tuwiuca Polychrome, and the Four Mile Polychrome characteristic of pueblos in the Showlow district on the skirts of the White Mountains either are one and the same or very closely related, indeed. Chavez Pass and Black Axe Polychromes, also, are so similar to these others as to require the studies of an expert for its specific identification. These are the wares - especially that of Homolovi - which so strongly influenced the designs used on the Hopi wares after 1300. Moreover, these pueblos all disappeared by 1400, when their inhabitants moved either to Hopi or Zuni (no other pueblo areas continued to be inhabited except Acoma, Laguna, and the Rio Grande), apparently because of the increased problems of erosion after the Great Drought.

Where, then, shall we draw the southern boundary for the Hopi country? On the basis of extended pottery studies, here briefed, the data would draw the line for the southern Hopi, at 1300 A.D., to include the Leroux Wash, the northern tributaries of the Puerco, and the Little Colorado. This would draw the line between Holbrook and Winslow. By 1400 there were fewer pueblos, but larger, as Brew, Colton, and others have pointed out. Sites of that century are not found on the Little Colorado. But on the basis of the earlier Hopi-culture pueblos there, the tradition of a number of Hopi clans having moved in to the central Hopi area from there when the large influx of population occurred in the 1300's and early 1400's, and the religious use of that area by the Hopi today (see chapter on Hopi Land Use), it would seem that leaving the Hopi southern line at the Little Colorado would be accurate, even as Fewkes and Hough thought at the beginning of this century.

To the east, the Jeddito Valley marks the edge of heavy Hopi occupation, although Canyon de Chelly was occupied by Mesa Verde migrants who probably became Hopi in the 14th century, and later received Hopi groups living away from the mesas for some years because of drought, as well as (apparently) groups from farther east or southeast who stopped here on their way to join the Hopi.

To the west, the Hopi had pueblos near Moencopi part of the time, and used the area for summer farms, using farm shelters here as well as going to and from the mesas, from the 14th century on, and apparently some of their people had lived in this area in the 13th century. The people of Black Falls, south of Moencopi on the Little Colorado, joined the Hopi.

To the northwest, the Kayenta or Tsegi area was directly related to the Hopi-Jeddito area of the period from shortly after the time of

Christ through P III (to 1300), and the people who left the more northern area at the time of the Great Drought appear to have moved in with the Hopi.

The evacuation of the Jeddito Valley started early in the 15th century with the movement of the bulk of the population from Kokopnyama to join the people on First Mesa and to found the pueblo of Sikyatki, four miles east of First Mesa, about 1425 (Hargrave, 1931, pp. 1-6). People continued to leave the Jeddito for the Hopi mesas, because the washes had cut farther and springs were more depleted in the Jeddito area (Hack, 1942, pp. 78-80). By 1540, when the Spaniards appeared, only Awatovi and Kawaika-a were left occupied in the Jeddito. On the Hopi mesas the population was concentrated in the towns of Oraibi, Shungopovi, Mishongnovi, Sikyatki, and Walpi.

A simplified and unified picture of the archaeological background of the Hopi, including the data which appeared in his earlier study on population fluctuations in northern Arizona (Colton, H.S., 1936, "The Rise and Fall of the Prehistoric Population of Northern Arizona," Science, Vol. 34, no. 2181, pp. 337-343), recently has been published by H. S. Colton in Black Sand (1960). Handling the prehistoric cultures of northern Arizona under the terms Sinagua, Kayenta, and Cohonino (the latter living to the west of the San Francisco Peaks and not being important for the area with which we are concerned), he states:

> After 1300 the territory of the Kayenta shrank from an area including most of northern Arizona to a small region surrounding the present Hopi mesas. However, it is not likely that the Hopi of today are pure-bred Kayentas. It is believed that after 1300 the Kayentas living on the Hopi mesas were joined by bands from other tribes, so the Hopi ancestry . . . is very mixed (pp. 58-59).

. . . It is very probable that the people of the Kayenta branch spoke archaic Hopi (p. 66).

On the basis of a survey of sites ("but a random sample of those present") in an area bounded on the north by Utah, on the west by the Colorado River and the San Francisco Mountains, on the south by the Little Colorado and the Puerco, and on the east by Chinle Valley (the area with which we are at present concerned) and using a very conservative figure of two persons per ground floor room and four per pit house (see p. 103), Colton has made out a table showing the estimated number of persons per square mile for a series of time periods, divided on the basis of cultural development, extending from 600 A.D. to 1950 (Op. cit., p. 106).

Pueblo Population of Northern Arizona
Between 110th and 112th Meridians

A.D.	600	3,000
	800	10,000
	1000	23,000
	1150	19,000
	1400	7,400
	1890	2,000
	1950	4,000

The population appears to rise from about 3,000 in 600 to about 23,000 in 1000, then to fall to about 2,000 by 1890. The Pueblo Indian population, i.e., that of the Hopi, has risen lately to about 4,000. The non-Pueblo peoples, such as the Navaho, are not included for they did not enter northern Arizona until the eighteenth century (Op. cit., pp. 106-107).

Colton explains that the area around Flagstaff, the Sinagua area, was abandoned for a time during and after the eruption of Sunset Crater just pre-1070 A.D. but was later heavily occupied when the eruption was over and it was found that the black sand freshly deposited held moisture and provided wonderful opportunity for farming. People from other areas pushed in and population rose rapidly. There is evidence that several springs of that area, now dry, carried water in the 11th and 12th centuries

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which suggests that probably there was a little more precipitation at that period than today. But by the middle of the 1200's, for whatever specific reason (and tree ring records do not explain it as rainfall deficiency until the end of the century) there was a recession in population in this area, formerly "one of the most densely populated farming communities of prehistoric Arizona." (Op. cit., p. 109.) By the 13th century only four pueblos were left inhabited near the San Francisco Peaks and by 1325 all were in ruins (Op. cit., p. 46). The people were moving elsewhere.

> Between 1200 and 1250 . . . people flocked into the Tsegi Canyons, building many large pueblos like Betatakin and Kiet Siel.
>
> The period between 1275 and 1300 seems to have been a particularly critical time for the people of the plateau. Northern Arizona, with the exception of the Hopi region, was abandoned as far south as the forested area north of the Mogollon and Tonto rims. During this period the Hopi country and Verde Valley received a great increment of population. Douglass (1935) through a study of tree rings has suggested a twenty-four-year drought at this time. Geologists (Hack, 1942) have presented clear evidence that an epicycle of arroyo cutting destroyed much of the best arable land. But since there are few arroyos in the Sinagua country, arroyo cutting could not have caused the migration of the Sinagua into the Verde Valley. Here we have another factor. The surface of the black sand was, after 1070, continually disturbed by agriculture. By 1275, the sand may have been collected by wind into dunes and blown into canyons, exposing large areas of the old limestone or lava soil. This was as unsuitable for agriculture then as it is today.
>
> While the regions about Navajo Mountain, the Tsegi Canyons, much of Black Mesa, and the Moenkopi drainage were being depopulated, the Hopi pueblos of Oraibi, Old Shungopovi, Old Mishongnovi, Old Walpi, Chuckovi, Hoyapi, Sikiatki, as well as other pueblos in the Hopi area, show an active building period. The same is true of the five great Hopi Pueblos in the Jeddito Valley - Kokopnyama, Nepshoptanga, Chakpahu, Kiwaiku, and Awatobi - which flourished with a total population of well over three thousand people.

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From our population studies of northern Arizona, we can see that people must have moved to and fro in the Tsegi area, in the black sand region, and in the Hopi country, but these local movements had no effect on the total population because they occurred within the boundaries of northern Arizona. If we are to account for the decrease of Pueblo population by emigration, we must try to see what happened during the period of population decline between 1150 and 1600 when we have evidence that many persons moved from nothern Arizona to some more favored region. If we consider each prehistoric tribe, one by one, we find that the Kayenta, Cohonina, and Prescott branches [Verde Valley] dwindled away, the Kayenta alone leaving modern descendants - the Hopi. There is no evidence that any large number from these three branches moved out of northern Arizona. Some of the Sinagua, on the other hand, did migrate to the Verde Valley, but these left no permanent population increase in their new locality. The few Sinagua that emigrated were a very small proportion of the northern Arizona population (Op. cit., pp. 109, 110).

Colton then concerns himself with the problem of reason for total population decrease in northern Arizona, for --

If we could have visited northern Arizona in 1150, we would have seen hundreds of small masonry pueblos scattered on both sides of every valley everywhere, with a large total population. Three hundred years later we would have found the whole population compressed into about twelve large villages. Although each of these large pueblos held fifty times as many people as a little pueblo of the 1100's, yet the total population of the area was probably not one-quarter as great (Op. cit., p. 110).

He examines possible reasons:

It is certain that warlike nomads hovered on the borders of the Pueblo area. Luzan in 1582 mentions them, but there is no documentary evidence that the Navajo or Apache were much of a threat to the Pueblos before they received horses. Indeed, it has not been demonstrated beyond a doubt that the Apache and Navajo were in Arizona at all before 1700. The nomads mentioned by Luzan were more probably Yavapai, Ute, or Paiute. Moreover, we may doubt that, in a semiarid region, nomadic hunters without horses or other beasts of burden seriously troubled a dense sedentary population. It was only when the population dwindled that the raiders' inroads became important.

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Haury has shown that droughts were sometimes so severe that a considerable number of people migrated to new homes looking for water. Droughts no doubt led to starvation, disease, migration, and wars, but droughts were probably, in the long run, not much worse in the years after 1100 than in the eight hundred years that preceded. Although tree ring studies show that the rainfall was increasing between 600 and 1000, there was no correlation between rainfall and population after 1000. As we have seen, the big decline in population began long before the great twenty-four-year drought that ended in 1300, although this drought has been considered the major catastrophe in Pueblo history.

Prehistoric Indians were doubtless subject to deficiency diseases, but probably not much more so than at present. Anyone who is familiar with the diet of the Hopi realizes that the Pueblo Indians make use of many wild plants. They have many kinds of "spinach", which they gather locally or cultivate in a small way. They also sprout beans in their kivas in the winter. Even without the animal viscera they eat, they would have a considerable number of vitamins. Therefore, lack of vitamins from animal sources could hardly be a serious factor in causing deficiency diseases.

The physiographers have shown us that arroyo cutting such as we see today all over the plateau has taken place in recurring cycles with periods of arroyo filling between. Some of these cycles have been dated and correspond to crises in plateau history when people moved about and certain areas were abandoned (Hack, 1942). This factor could not have been important in the black sand region because there are few if any arroyos to be affected, although over the plateau as a whole, arroyo cutting furnishes an important explanation for the loss of population and must not be cast aside.

There are other local causes for the abandonment of certain areas. There is little doubt that the large Winslow pueblos were abandoned by the prehistoric inhabitants when their irrigation water carried alkali to the fields, just as happened between 1876 and 1889, in the same area when the Mormons, who founded Brigham City and Sunset, had to abandon their homes.

For the total abandonment of much of northern Arizona, we must look for causes more general than local. We see that the population rose while the people lived in pit earth lodges and fell when the pueblo became their home. An explanation of this is suggested when we study the lives of the present-day Hopi and Navajo.

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Here we have two peoples living in the same environment. But the "urban" Hopi are little more than holding their own in population while the pastoral, rural Navaho are increasing at a rapid rate. . . . The Navajo earth lodges, called "hogans", are usually widely spaced, and it is rare that one finds as many as four of them close together. The Navajo move seasonally to summer and winter residences as do many other people in the United States (albeit for different reasons). Therefore, their water is not contaminated by human excreta, since their supply is usually far distant from their living quarters. Although human excreta are deposited not far from the hogan, they do not present a menace to health because of the sparsity of population and the semiarid climate. [Also the custom of covering such, to avoid the possibility of witches collecting bits and using them to do damage to the individual.]

Like the pithouse dwellers of yore, the Navajo are increasing rapidly. Since 1868, when they were replaced on the reservation after their forced sojourn at Bosque Redondo, their number has increased, it is said, from 8,000 to over 70,000. I think the 8,000 is far too low a value, as information exists that Colonel Kit Carson did not capture more than half of the tribe while the rest scattered to the Rainbow Plateau, to Black Mesa, and into the Little Colorado River Valley. We should consider 16,000 a much more likely figure. Even the increase is phenomenal, for in sixty years they have increased threefold, for an average gain of about 3% per year. In the 1820's and 1830's, when the population of the United States was largely rural and immigration was at a low ebb, the annual national increase was a little more than 3%. In the four centuries from 600 to 1000 the pithouse people increased at an average rate of 1-2% per year. The Hopi have been increasing at .5% per year in modern times.

The Hopi family, on the other hand, lives in crowded quarters. Families live close together, and the excreta are often deposited in the narrow plazas, streets, middens, and passages near the houses. Were it not for the arid climate, living conditions would be impossible.

Although the drinking water is usually procured from a spring at some distance from the village, yet in times of heavy railfall, temporary pools filled by surface runoff form on the rocks close to the village. This water is contaminated with excreta. Rain water happens to be of ceremonial importance. When one protests to a Hopi grandmother about giving an infant a drink from the pool in the street, she will tell you that the water can't be bad because it fell from the clouds and so was especially sent by Sotuknangu, the Heavenly God. The mortality of Hopi children under two years of age is very great, especially after the summer rainy season (Op. cit., pp. 111-114).

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. . . When the people crowded together [in the 12th and 13th centuries] the sanitary conditions became increasingly bad, causing the death of many young children from "Summer complaint". The population dwindled until by 1275 but two large apartment houses were occupied, and by not more than six hundred people [in the Flagstaff area]. The drought which followed (1276-1299) caused these last inhabitants to move away to join other groups who dwelt by the Little Colorado River at Winslow or at Chavez Pass or in the Verde Valley. By 1300 the cycle of development initiated by the eruption of Sunset Crater was complete.

In the next six centuries, the country about the San Francisco Peaks held no permanent population. The Hopi visited it for timber and medicines. The Yavapai from the Verde Valley and the Havasupai from the Grand Canyon hunted in the area. But until Flagstaff was settled in 1882, on the completion of the Atlantic and Pacific Railway, now the main line of the Santa Fe Railway, no permanent population lived in the region of the black sand. (Op. cit., p. 118.)

Among the three hundred cinder cones which cluster about the San Francisco Peaks, Sunset Crater has most attracted the attention not only of the white man, but also of the Indian. The Hopi Indians living seventy miles northeast of the crater believed that many of their kachinas, beneficent spirits who play such an important part in their mythology and ceremonials, dwell on the forested slopes of the San Francisco Peaks. Before many a kachina dance, in which the spirits are personified, is held in the plaza of a pueblo, a group of Hopis travels to the Peaks, in the old days on foot, now by pickup truck, to place prayer offerings in secret shrines and gather Douglas fir branches to decorate the dancers and the altars. On the way to the Peaks their old foot trail led by Sunset Crater, and it was their custom to deposit an offering in the ice cave at the base of Polotsmo, "the red hill," the Hopi name for Sunset Crater. In the ice cave, a collapsed lava tunnel where ice is found even in the summertime, the early white inhabitants of Flagstaff report finding pottery jars which the Indians had offered to their gods. And, according to Hopi belief, one band, the Kana-a Kachinas, lived on Sunset Crater itself. Hopis will point out to you the line of stunted pine trees on the rim of the crater which resembles a line of marching kachinas in a dance.

Yaponcha, the wind god, the spirit of the whirlwind, dust devil, the djinn of the American desert, is said to live in a crack in the lava flow from the crater, where he was once sealed in with corn meal mush by two little war gods of the Hopi, Po-okong-hoya and Balonga-hoya. Sunset crater is an important place to the Hopi. . . (Op. cit., p. 4.)

The picture, then is one of the direct Hopi ancestry being the people of the Tsegi and Hopi territory. To those in the Tsegi was added one increment from the San Francisco Mountain area (Sinagua). Other groups moved toward the Little Colorado, lived there for a period, and moved to Hopi. The Tsegi people moved to Hopi. Still other people from Palatkwabi, wherever this may have been in the south (generally considered to have been Gila-Salt area or Verde Valley) lived for a time in the Homolovi pueblos and then joined the Hopi. People from the Rio Grande, as well as occasional small additions from Zuni, joined the Hopi. For a time the Hopi pueblos included those of the Jeddito area, Antelope mesa, etc., but drying of springs, probably, and incursions of Utes made a movement toward the Hopi mesas practical. Such problems likewise probably were the basis for the relatively late movement of the Hopi onto the mesas from the sites they formerly occupied on the plains below.

The largest increment to Hopi population came with the Great Drought of 1276 to 1299, when the springs in their area continued to hold water better than those of most of the other areas in northern Arizona, because of the type of formation in which they occurred. When the people emigrated, they continued to claim and use many shrines, springs, eagle nests, and other natural resources and sacred spots formerly possessed in areas formerly occupied and claimed by no others until the Navaho arrived and spread throughout the area. Because Hopi ceremonial life is exceptionally full, these areas are frequently visited today for whatever uses or rites they have been remembered. Although the Hopi did not accept all the new people with equanimity when they first arrived, eventually they were united to the whole, and although the Hopi have had their own quarrels within the

group, the whole is a unit in long resentment of the Navaho usurping and running over their old lands and even their fields and orchards close to the villages. This does not mean that they dislike the Navaho as individuals; intermarriage has taken place to some extent and borrowing of traits by the Navaho attests (as do historic references) to Navaho frequently being present on ceremonial occasions and doubtless hearing much of the background lore of their hosts. It appears that Navaho began to trickle into the Hopi area from the east in the 1600's, and were few in number and not a problem until at least the mid-1700's. As eastern pressure on the Navaho grew, so did the number of Navaho in the Hopi country. Between 1858 and '68, most of them fled and remained in hiding in the hinterlands, except for those who gave up and moved to Fort Sumner. After liberation in 1868, the Navaho closed in on the Hopi, more and more, limiting use of their formerly held lands, and in spite of frequent requests by the Hopi for aid, no steps were taken until far in the 1900's.

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Summary on Hopi land use area:

Hopi territory in the period known as P IV (1300-1700) could be summarized as extending from the Colorado River on the west to Black Mesa on the north and Chevlon on the south. The eastern line would make an angle, running from Black Mesa to Steamboat Canyon and then southwest to Chevlon. This does not take account of the Canyon de Chelly area which formerly had served as home for certain of the clans for longer or shorter periods and which continued to be occupied for occasional brief intervals even after the Navahos took over that area in the 1700's. In the period customarily referred to as P V (post 1700), the Hopis have been pushed and crowded by the expanding Navahos. Nevertheless the Hopi continued to use the outer portions of this outlined territory for hunting, gathering, small farms with houses occupied in the summer, and shrines periodically visited and revered as in former centuries. After the Americans, Mexicans, and Pueblos began their concerted efforts to quell the ever-increasing raids by Navahos (1858), the Navahos moved out from their previously occupied areas and hid in peripheral districts known as the territory customarily utilized by other adjacent tribes. For some the period of hiding was brief, but others - as small family groups or small bands - continued to hide through part of or even all of the Ft. Sumner period, 1864-1868. When the Navahos were returned from Ft. Sumner they were placed on a reservation which proved to be too small for the entire group, as - although some had lived in the west previous to the Ft. Sumner period - others had formerly lived farther to the east in Chaco Canyon, along the west side of Mt. Taylor, etc., and these eastern locations now were largely abandoned. (Officially they were abandoned; unofficially, some Navahos - but not as many as earlier - continued to utilize some of

Hopi-use 1300-1700

after 1700

moving of Navaho after 1858

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the non-reservation lands.) The problem of over-crowding of the original reservation was increased by a series of drought years. The natural result was that the Navaho did not remain within the new reservation - even after it had been enlarged. Hopi complaints of Navahos having pushed into their territory continued periodically from the statements mentioned by Donaldson pertaining to Navahos infringing on the eastern Hopi lands about 1819 (Donaldson, Thomas, Moqui Pueblo Indians of Arizona and Pueblo Indians of New Mexico. Extra Census Bull., Washington, 1893) to the present years. Like the other Pueblos, the Hopi were prohibited by United States law from resorting to arms to drive off invading peoples: the result was loss of exclusive utilization of their old territory after 1858.

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HOPI AREA DENDRO DATES
(Smiley, Terah L., A Summary of Tree-Ring Dates from Some Southwestern Archaeological Sites, Univ. of Ariz. Bull., Lab. of Tree-Ring Research No. 5, 1951)

	Range	Number of spec.	Dated by	Site dating	Concent
Jeddito Area (Op. cit., no. 74)					
a. Kokopnyama, MA 1019	1254-1430+	40		GO	1254-1274,[1] 9 at 1360-1370, 15 at 1380
b. Chakpahu (NA: 1039)	1377-1390+	12		PO	4 at 1377-1379, 8 at 1386-1390
c. Kawaikuh (NA: 1001) (Kawaika-a)	1284-1495	53		GO	5 at 1380-1400
d. Awatovi (NA: 820)	1213-1700	468	ETH	?	
e. Pink Arrow	1365-1387	33	ETH	?	
f. Site 4	1250-1255	39	ETH	?	
g. Site 4A	701-794	33	ETH	?	
h. Site 104	1247+-1285	96	ETH	?	
i. Site 106	1255+-1262+	4	ETH	?	
j. Site 107	1180+-1216+	4	ETH	?	
k. Site 111	1026+-1274	12	ETH	?	
l. Site 169	1007+-1052	3	ETH	?	
m. Site 264	650-816	86	ETH	?	
n. Naha Formation[2]	1383+-1696+	12	ETH	?	

[1] References: a and b: TRB 5:2:11:38; c through n: TRB 17:4:27:51.

[2] Footnote to presentation in 17:4:27:51 -- The latest of three valley fills in the Hopi country. Two stations. Potsherds of P III and IV type were found in addition to charcoal from a firepit in the top of the formation.

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In a commentary on the care necessary in interpreation of tree-ring dates for archaeological use, Smiley presents the Hopi pueblo dates and their interpretation:

> The concentration of dates can aid in disclosing the reuse of beams and the repairing or rebuilding of structures, and it can aid in arriving at an estimation of cutting dates for specimens having no bark cells present. It can also be very misleading if not understood and applied correctly. For example, archaeology and history together show the Hopi pueblos date as follows.

Pueblo	Tree-Ring Dates	True Period of Occupation
Oraibi	1344-1779	1150-1950
Shungopovi	1365-1710	1700-1950
Shipaulovi	1537-1588	1700-1950
Walpi	1368-1691	1700-1950

> This example illustrates the necessity for completely integrating all information. The village of Oraibi has been continuously occupied for many centuries, but Shungopovi, Shipaulovi, and Walpi were moved after the Pueblo Indian revolt of 1680 from the foot of the cliffs to the top of the mesas where more protection was available. Thus it can be seen that unless the moving of these three villages is understood, the tree-ring dates on the present villages are at complete variance with the actual construction dates on the houses; the material culture in the three will substantiate the more recent dates. The study of archaeological remains and historical manuscripts illustrate the fallacy of using only the concentration of tree-ring dates to determine the length of occupation on any pueblo. Accurate interpretation of dates must be based on the integration and correlation of those dates with all the facts and artifacts of the specific date and adjoining sites and with the total cultural pattern within which that site belongs (Op. cit., pp. 10-11).

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JURISDICTION OF ZUNI

ZUNI At eighty leagues from Santa Fe and on the frontiers of Navajo and Moqui is the mission of Nuestra Senora de Guadalupe of Zuni Indians, called previously La Purissima Concepcion de Alona. It rests in a flat plain with a spring for the supply of the pueblo. At a league distant from it runs an arroyo. Notwithstanding the frequent attacks which it suffers and campaigns which it makes, it had always maintained itself well populated. In 1707 it had fifteen hundred souls; in 1744, one hundred and fifty families; in 1765, one hundred and eighty-one families and six hundred and eighty-four souls [664]. In 1779, three hundred and sixty-five families [settlers] with one thousand one hundred and ninety-nine persons who live in three hundred and fifty adobe houses. They possess two hundred and ninety-five fanegas of sowing and they had fifteen thousand three hundred and seventy-six head of sheep [15736].

TOMÉ In 1765 Tome was re-settled. It is the first place which one encounters going from El Paso to Santa Fe. It is distant from the former according to Senor Tamaron ninety-six leagues and comprises there four hundred and two persons. In this jurisdiction there have been abandoned Caguima, Pueblo Redondo and Taguicu.

These are the only settlements which the crown today possesses in the interior of the kingdom. As we see in history, many other pueblos, haciendas and ranches, and the celebrated province of Moqui with all the nation which lives there, have been lost in the general Revolt. As it will be necessary to treat Moqui frequently we shall set out its description, copying that which a religious, Father Fray Silvestre Velez Escalante, sent. Although young, he was one of the most meritorious in the Custody because of his talent, learning, his labors and above all because of his virtues which made him sacrifice his hopes, health and life for the conversion of those souls, for having retired from the province to regain his health he died in El Parral during April of 1780. He made several journeys to the province of Moqui employing all his care [in instructing himself in the qualities of the land, its situation] and strength of the places; in a word, to whatever might contribute a perfect understanding of the country.

MOQUI Forty-six leagues to the west of Zuni with some inclination to the northwest are the three first pueblos of the Province of Moqui, which today in the small district of four and one half leagues has seven pueblos on three mesas or penoles which run in a direct line from the east to the west.