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TRADE AND TRAILS IN ABORIGINAL CALIFORNIA

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INTRODUCTION

This preliminary report does not cover fully the data on Indian trade in California. It may show, however, that the study of native trade is an important approach to the study of aboriginal culture contact in California. The trails are lines of direct diffusion and culture may spread rapidly along these routes. Charting of material traded between particular tribes as obtained from ethnographic and historical sources may help the archaeologist analyze sources of artifact materials found in sites.

Trade as described in this paper represents the situation as it existed at the time of Caucasian discovery and during the early period of contact. This means a different time period for northern, central, southern, and sierral California, each explored at different times. Some of the trade mentioned is undoubtedly very old. It is possible, also, that some was stimulated by the presence of white traders and highly valued white man's goods. Wherever the circumstances point to its being a late development, these facts are pointed out.

As can be seen from the map, trails covered all of California. The dotted lines are used to show probable routes. On a map of this small scale the trails are necessarily diagrammatical. An accurate representation of these trails plus minor ones has been drawn on a 1:500,000 projection of California and deposited in the office of the University of California Archaeological Survey for reference. The complete mapping of trails is important to the study of culture history and diffusion in California.

Myriads of Indian trails crisscrossed each other in the valleys of California. Early travelers were often confused by the multitude of choices; they needed and used Indian guides to show the correct paths. George Gibbs, with Colonel Redick McKee's expedition in 1851, became lost on the way between Sonoma and Humboldt Bay even with a guide: "We halted for half an hour, while the guide sought a route; no easy thing in a country presenting such an endless succession of hills and cut up everywhere by Indian and deer trails."[1]

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1 See notes, p. 6

The trails in the sierra regions followed natural passes. Many trails were wide and worn a couple feet deep from long use. They could be traced long after the Indians had gone and the paths were abandoned. They seem to have gone in straight lines--the shortest route to the destination--without detouring for mountains in the way. Stephen Powers says in speaking of the Wailaki that time and again he wondered why trails went over the highest part of the mountains. He finally decided that the elevated points provided lookout-stations for observing the movements of enemies. He describes Indian trails as running along streams where the whole face of the country was wooded. In somewhat open country, they ran along the ridges, a rod or two below the crest--on the south side of the crest if the ridge trended east and west, on the east side if it trended north and south. The west or north side of a hill is more thickly wooded; on open ground the traveling was easier, and the Indian could not be surprised either by their enemies or by wild animals.[2]

Trails were marked in various ways. It has often been suggested that pictographs were used to show the route or mark the way. Mallery says that pictographs are found at or near the origin of all the trails in the Santa Barbara region and that a pictograph in Azusa canyon between San Gabriel Valley and the Mohave Desert refers to the course of the trail through the canyon.[3] This explanation of pictographs has never been adequately proved, however. Sometimes piles of twigs or cairns of stone along a trail have been called markers. Powers says that branches and twigs piled at the junction of Yurok trails sometimes accumulated in heaps several feet high. Every Indian passing deposited a twig on the pile. The Yurok could not explain the significance of this custom. It may have been a gesture to luck such as was the Yurok custom of shooting arrows at certain trees on the trail.[4] When Gibbs asked the Indians along the Klamath about stones piled three or four high beside the trail he was told that they were built only for amusement of idlers. According to Barrett and Gifford, the Miwok sometimes marked an obscure trail by throwing sticks down; in the treeless high Sierra Nevada, they were supposed to mark the trail over the rocks with pine needles.[5] Powers says that the Miwok would also hang up a dead skunk beside a difficult trail and let the scent guide the traveler. He maintains he saw this himself![6]

The Yurok of northwestern California preferred canoeing to other forms of travel and were, consequently, better acquainted with the Hupa and Karok up the Klamath River than with the Tolowa just north on the coast.[7] The Hupa of the lower Trinity River traded chiefly with the Yurok. They had products very similar to the Karok and had little intercourse with the Wiyot, Nongatl or Wintun.[8] The Bear River Athapascans did not trade much with the Wailaki and Sinkyone because they had troubles with them. According to one of Nomland's informants the Wailaki made a special kind of poison that the Bear River people did not know and people who went into this territory were liable to be poisoned and die in a week or two. The Bear River people seem to have traded mostly with the Hupa although these were farthest away from Bear River territory.[9] Between the Sinkyone and northern Athapascans there were steep mountains; to the south there were natural passes giving easy access to the Kato and Yuki. This may account somewhat for the lack of trade between the Sinkyone and northern Athapascans. Most Yuki trade was with peoples to the south; hostility was felt toward the northern groups. The Coast Yuki would not go through Wailaki territory although they were friendly with the Sinkyone.[10] The Yuki were friendly with the Wailaki but did little trading with them, perhaps because of a lack of desirable trade material which the Wailaki could offer.[11] The Round Valley Yuki made periodic trading trips to the Russian River. They did not, however, often cross the Coast Range barrier to trade with the Wintun of the upper Sacramento Valley.[12]

The Wappo of Napa Valley traveled to the coast at least once a year taking about two days each way. In spring and summer they made trips to Clear Lake and to St. Helena for trading purposes.[13] The Pomo were extensive traders; they made long trips within their territory and as far south as Bodega Bay on the coast. Clear Lake was open to visitors and these included: the Matuho and Potter Valley Pomo groups; Cache Creek Patwin, and Coyote Valley Miwok to Lower and East Lakes; Long Valley Patwin to Shigom and Upper Lake.[14] The Pomo area was the principal source of clam shell beads and magnesite cylinders for northern California. There are more beads found in sites along the north side of San Francisco Bay than in the sites along the south Bay.[15] The Pomo, therefore, probably supplied the northern San Joaquin Miwok, also. It is known that the Miwok made trips to Monterey and an informant of Miwok ancestry claimed that they got abalone shell from Monterey.[16] Yokuts friends sometimes traded to the Miwok to the north a string of clamshell disc beads.

The Nez Perce Indians of southeastern Washington visited California in the first half of the 19th century coming along the Walla Walla trail (shown entering California at Goose Lake, following down the Pit River and Hat Creek to the Sacramento River). Plains influence may have reached northeastern California along this trade route. Kroeber suggests that these influences diffused down the Columbia, up the Deschutes River, and over the divide into the drainage of Klamath Marsh.[17] There was a trail up the Deschutes (the one used by Peter Skene Ogden in 1827) which may have reached California. Intercourse with the Klamath Lake people, however, was evidently slight for all California tribes, although the Shasta traded with them to some extent. It seems more likely that Plains influence should have come from the east directly from the most Plains-ized of the Plateau tribes, the Nez Perce, rather than through the less Plains-ized Columbia tribes.

The Achomawi served as middlemen in the trade between the Wintun and the Modoc and Paiute. The Wintun had shell beads wanted by these northeastern people. The Maidu traded chiefly with the Wintu. The Nisenan (Southern Maidu) had little trade relations with the Maidu, Miwok, or Washo excepting

those at the head of the south fork of the American River. While crossing the summit of the Sierras in this region while it was still winter, Fremont found Washo crossing to the west.[18]

The Paiute carried trade articles to the Miwok, to the Western Mono (Monachi) and to the Yokuts. The Mono only occasionally went east across the Sierras to the Owens Valley Paiute,[19] but they made trips to the Yokuts trading their own products and those obtained from the Paiute. T. J. Mayfield, who grew up with Yokuts, maintained that, the Yokuts and Mono being essentially unfriendly to one another, the trading was carried on by a few members who made a business of it.[20] The Miwok and Yokuts made trips into Costanoan territory to trade; the Yokuts also traveled to the Salinan and Chumash on the coast. The Tubatalabal went as far east as Randsburg on the Mohave Desert, southwest of Tejon and west to the Chumash area around Ventura, and to Tulare Lake. The Chumash may have come occasionally as far as Tubatalabal territory.[21] Mason says that "numerous items make it appear that the Salinan Indians made trips to the Tulare Lakes as well as receiving those people as visitors.[22] The coast people probably did return the visits of some Yokuts tribes, but these trips appear not to have been continuous or regular.[23]

The Salinans were enemies of the Costanoans on the north and, according to Kroeber, were too far away from the Chumash for trading.[24] It is also possible that the products of these two coastal peoples were enough alike that the interior Yokuts articles held greater trade value to both.

In the far south the Kamia and Diegueno visited each other regularly. The Eastern Diegueno living in the mountains, usually came in the cold season when they were running low on food.[25] The Yumas wandered extensively up and down the Colorado. They traveled to the territory of and received visits from Halchidoma, Mohave, Yavapai, and Papago.[26]

Some of the longest trips in California were made by the Mohave traveling to the California coast to trade with the Chumash, to the lower San Joaquin Valley to trade with the Yokuts, into Arizona to trade with the Yavapai and others. They were the distributors of Southwest material in California. Trade between southern California and the Southwest has been demonstrated archaeologically. Pacific coast shells have been found in Pueblo ruins. According to Brand, nine species of shells found in 132 Southwestern archaeological sites could have come only from approximately what is now the Southern California coast.[27] This trade was already important by 900 A. D. (some trading may have taken place earlier) as inferred from dating of Southwestern sites in which Pacific Coast Haliotis sp. and Olivella biplicata are found and from dated Southwestern pottery sherds found in Pacific Coast shell mounds.[28] Grooved axes of Southwestern origin have been found in the Santa Barbara Channel region and sporadically as far north as the Oregon line.[29] An interesting archaeological specimen is a Glycymeris shell bracelet found in Orange County, Southern California. Glycymeris shell was a Gulf of California shell traded into Arizona. A. Woodward says that the carving on the Orange County specimen is reminiscent of Gila Valley work.[30]

That the coast Indians were in contact with the Colorado River tribes is documented in historic sources. The Spanish mission padres were constantly hearing Coast Indian rumors of white, bearded and armoured men to the east. Cabillo in 1542 was told by the Chumash that armed and mounted men were seen to the east- a reference, with little doubt, to the Coronado expeditionary force. Garces in 1776 was told by Mohave Indians that they would gladly guide him across the desert-- they were used to making the trip to the coast. On the trip along the Mohave trail, Garces met two groups of Mohave returning from the west with shells. He was amazed to find them making the trip without provisions or weapons to hunt. Without burdens of this kind the Indians said that they could cross the desert in four days. At the edge of the San Joaquin Valley the Mohave guides refused to go north. They said that

they were afraid of the "Nochi tribes."[31] This might indicate that the Indians of Tejon, Kitanemuk or Alliklik, were middlemen in the trade of Mohave and Southwestern goods into the valley. When Fremont left the San Joaquin Valley in 1846-7, however, there were Colorado River people actually in the Valley trading. Fr. Front said that the Indians of the Channel (Serrano) had commerce with the Mohave and other Colorado tribes in their shell beads. At Rincon, he saw an Indian who wore a cotton blanket like those made by the Gila Pimas and decided it came through commerce the coast had with the interior.[32] Garces saw this same type of cotton blanket among the Halchidhema and indicated that they also reached the Mission of Monterey. Soldiers from Monterey talking to Tulare Indians about 30 leagues from San Luis Mission heard that the blankets came from the east five days distant.[33]

Anza was told in 1774 that the journey from the Yuma country to the Hopi took twelve days. He says that there were many Hopi blankets among the Yumas and that they acquired them from the Siopa.[34] Font, on his second expedition, stated that the Yuma had no blankets when he saw them the year before but now they were getting cotton blankets made by the Maricopas and some from the Hopi. He notes the Halchidoma as a source of the supply of Pueblo blankets among the Yuma.[35] Forde thinks the Mohave and the Havasupai were the middle-men transmitting Pueblo goods to California.[36]

It would seem, then, that Southwest products reached California through Mohave hands. The Halchidoma got the products from Mohave and traded them to the Yuma who passed them through the Kamia of Imperial Valley to the Diegueno. The Mohave carried the articles directly to the California coast and either brought them directly or passed them through intermediaries into the San Joaquin Valley.

It seems apparent that in California as a whole east-west trade was more important than north-south trade. The ecological differences imposed by seacoast, coast range, interior valley, and sierral environments is probably the answer. Important and long distance trading occurs between people having available a surplus of desirable and contrasting products. For example, the valley people always looked to the mountaineers for those articles needing particularly pliable or strong wood--such as cedar and yew bows; the interior depended on the coast for shells. It is interesting that Pomo clam shell discs that came to the Karok and Hupa did not come up the coast but passed east and then west. Dentalia shells from the north found their way roundabout and came to the Yuki from the east. There seems to be a decided break in trade in the Sinkyone-Yuki area. The principal traveling here was east to west. The Shasta and Modoc carried their goods toward the west. The Wintun crossed to the Pomo, and the Miwok went to the Costanoan. The Paiute crossed to Western Mono, Western Mono to Yokuts, Yokuts to Salinan and Chumash. Mohave traders traveled to the coast. Travel west to east was mostly sporadic and for short distances.

Raw material was traded but oftimes it could be gathered free. Manufactured goods such as bows, arrowheads, beads, baskets, clothing, were always bartered. The value of goods lay in the labor involved in their manufacture.

It is hoped that this information, gathered mostly from ethnographic sources, will help the archaeologist draw conclusions on the sources of trade material in sites. In a final report, the combination of knowledge gained from archaeological site reports with the ethnological material should make a fairly complete and significant contribution on this phase of primitive economics in California.

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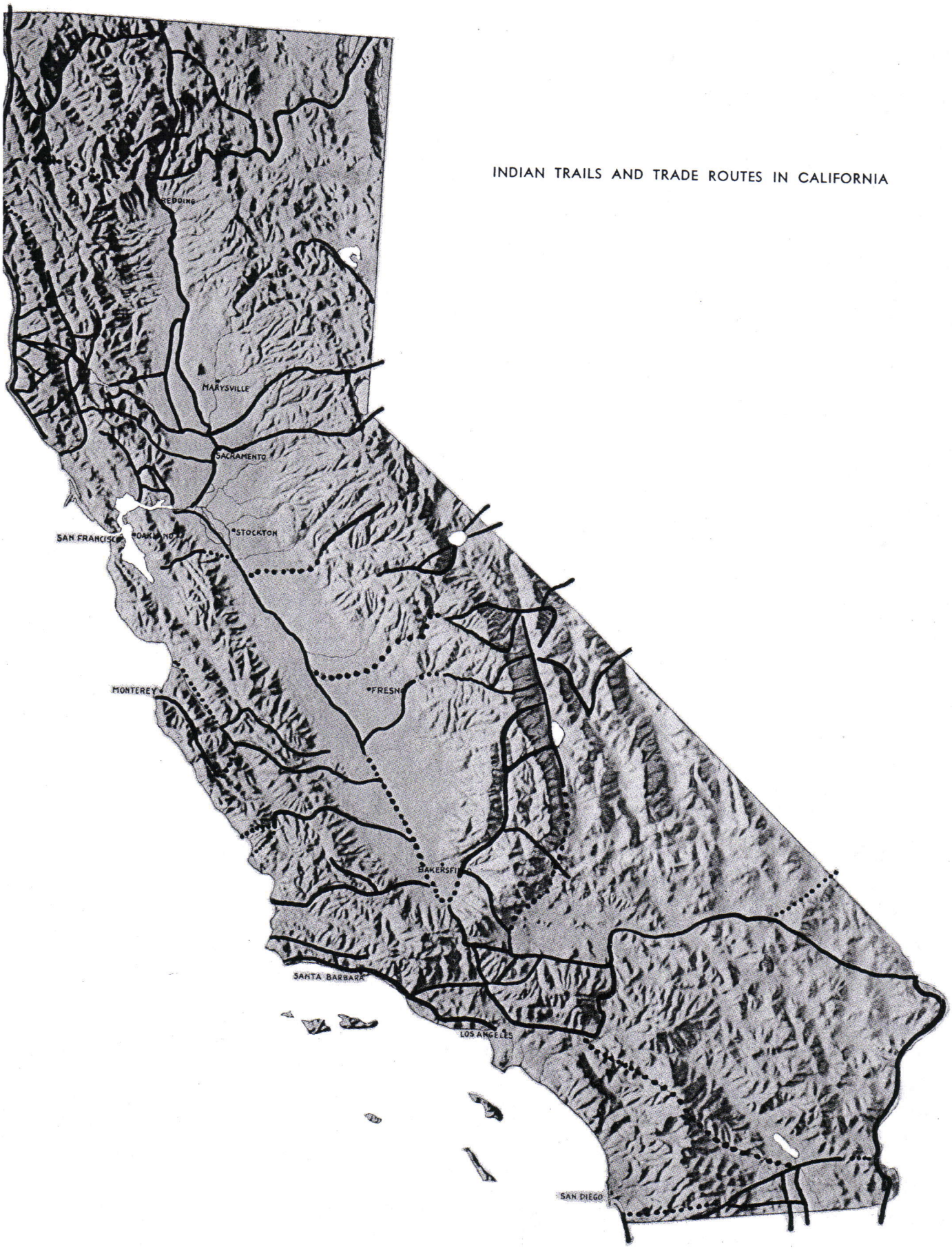
Footnotes

1 Gibbs, p. 99.
2 Powers, p. 119
3 Mallery, 1888-89, p. 355.
4 Waterman, 1920, p. 185. See also Powers, 1877, pp. 382-83.
5 Barrett and Gifford, 1933, pp. 256-7.
6 Powers, 1877.
7 Waterman, 1920, pp. 184-5
8 Kroeber, 1925, p. 132
9 Nomland, 1938, p. 105
10 Gifford, 1939, p. 306
11 Kniffen, 1939, p. 375
12 Powers, 1877, p. 127.
13 Driver, 1936, p. 194
14 Kniffen, 1939, pp. 361, 375
15 Schenck and Dawson, 1929, p. 373
16 Schenck and Dawson, 1929, p. 374.
17 Kroeber, 1929, p. 334
18 Fremont, 1887, p. 333
19 Gifford, 1932, p. 19
20 Latta, 1929, p. 15
21 Voegelin, 1938, p. 52.
22 Mason, 1912, p. 108
23 Gayton, 1948, p. 9
24 Kroeber, 1925, p. 132
25 Gifford, 1931, p. 17
26 Forde, 1931, p. 105
27 Brand, 1938, p. 5; Colton, 1941, p. 6, adds one more species.
28 Heizer, 1946, p. 191
29 Heizer, 1941, p. 188
30 Ashby and Winterbourne, p. 84.
31 Bolton, 1930, Vol. 1, pp. 447 ff.
32 Bolton, 1931, pp. 250, 257
33 Bolton, 1930, Vol. 2., p. 386
34 Bolton, 1930, Vol. 2, p. 50
35 Bolton, 1930, Vol. 4, pp. 52, 73, 103, 109
36 Forde, 1931, p. 106

BIBLIOGRAPHIC REFERENCES TO TRAILS SHOWN ON MAP.

Northwest Coast trails: -- Rogers, H., p. 243; Waterman, 1920, 184-5. Loud, 1918, 23, 263.
Klamath and Trinity trails: -- Waterman, 1920, 184ff and maps; Miller, 1873, 162.
Castle Crags trail: -- Miller, N. D. 4.
Mt. Shasta trail: -- Miller, 1873, 32; Maloney, Ms.
Nez Perce trail entering northeastern California: -- John Work, 1945 passim, and map.; Maloney, Ms.; Sample, Field Notes on Trade in the Plateau.
Sacramento Valley trails: -- Work, J.,1945;Maloney, Ms. (Also trail up coast from Ft. Ross).
Trails leading west from Sacromento River, northwest from Bay, and through Donner Pass: -- Trails recorded in UCAS Archaeological Site Survey Reports. n.d.
Trails of Wappo, Pomo, Yuki region: -- Foster, 1944, 157f.; Driver, 1936, 194; Stewart, 1943, 34f.; Gifford 1939, 300f.; Kniffen, 1939, 261f.; Gibbs, 1860, 100-9.
Washo to Maidu: -- Field Notes W. Evans and F. Riddell.
American River and Pass: -- Fremont, 1846. 305,346.
North Fork Tuolumne River: -- Barrett and Gifford, 256.
Mono Lake and Owen's Valley trails: -- Farquahar, 1949, 539-40; Steward, 1933, 257; Steward, 1934, 431; Steward, 1938, 44f.; Fremont, 1847, 445.
Yokuts trails: -- Gayton, 1948, 147, 175, maps (across Sierras); Latta, 1949, 67-8 (across Coast range); Farquahar, 1932, 251, San Miguel Pass; Gayton, 1936; Latta, 1929.
Tubatalabal trails; -- Voegelin, 1938, 51.
Monterey trails: -- A. R. Pilling, n.d. (b); Fages, 1911, 147.
Santa Barbara coast and Santa Ynez trails: -- Cooke, 1940, 5f.
Mohave trail: (Los Angeles to Needles): -- Farmer, 1935, 155f; Johnson, 1927, 368; Van Dyke, 1927, 356; Fremont, 1846, 156-9; Brand, 1938, 8; Colton, 1941, 1.
Route out to Nevada: -- Colton, 1941, 11.
Colorado River trails: -- Bolton, 1930, Vol. 2, 384.; Vol. 1, 108-11.
Imperial Valley trails: -- Gifford, 1931, 8f; Bolton, 1930, Vol. 2, 59; Vol. 1, 118-148.
San Diego trail: -- Colton, 1941, 11.
Proposed Borrego Valley -- Coyote Canyon -- San Carlos Pass -- Cahuilla Valley -- San Gabriel trail: -- Bolton, Vol. 1, 148ff.

INDIAN TRAILS AND TRADE ROUTES IN CALIFORNIA



POMO

Supplied to:

Coast Miwok ----- Magnesite, skins, acorns (Kniffen, 1939, 361; Loeb, 1926, 195)

Received from:

Coast Miwok ----- clam shells (probably gathered a great deal freely) (Kniffen, 1939, 361)

See: Patwin, Yuki, Coast Yuki, Wappo

Clear Lake Pomo: These received iris cord for deer snares from the north (Kniffen, 1939, 361). Since their native backed-bow was of mahogany they also traded for northern yew bows and arrows (Kroeber, 1925, 257). Parties from Sherwood visited the east Lake people yearly bringing bows and arrows. The northeast Pomo were the source of salt for the Lake people and they traded for acorns sometimes from the Russian River people. The source of the highly valued magnesite was in Kai territory a little east of the lake. Lake people might go there and help themselves but more frequently the Kai sold it. Parties went to Bodega Bay (100 miles) in the late summer for clam shells. They got mussels, seaweed, haliotis shells, furs of small seals or possibly sea otters from Pomo of the coast giving them fish acorns, skins, and magnesite. The Clear Lake region had a surplus of magnesite, fish, furs, skins, and sometimes acorns. They needed yew bows, shells for making money, seaweed, and salt. (Kniffen, 1939 360, 361; Stewart, 1943, 43; Kroeber, 1925, 257)

Northern Pomo: The northern Pomo gave salt to the Potter Valley people who came across the mountains to purchase it. Clear Lake Pomo sometimes come to get salt. The northern Pomo got some clamshell from Shelter Cove in Athapascan territory. (Kroeber, 1925, 236, 248). In this northern area the coast people provided clamshells and the interior people furnished red bud for basketry (Essene, 1942, 21) and apocynum, Indian hemp, (Gibbs, 173). The Mato of the Northern Pomo got their bead money already made and magnesite cylinders from the Ukiah Indians. The Mato also got obsidian points from Lake county. Other northern Pomo (the Masut of Calpella) went to Lake County for obsidian and magnesite. (Stewart, 1943, 34, 36, 78)

Central Pomo: The Cokoa Pomo just south at Hopland took pinole or acorn flour to the Bokeya of Point Arena and exchanged it for dried sea food. They got fresh seafood and salt free. They went to Bodega Bay for whole shells and got obsidian and unbaked magnesite and lake fish from Lake Pomo. The Point Arena people (Bokeya) got shell beads, magnesite money and obsidian from the East (Lake Pomo) and gave sea food, acorns, berries, pinole seed, deer??. The Makomotcemi Pomo of Cloverdale got salt and sea food from Stewart's Point (Southwest Pomo) free and did not pay for clamshells at Bodega. They also procured obsidian and magnesite from Lake county. (Stewart, 1943, 38, 46, 49, 52).

Southern Pomo: The Bitakomtara Pomo of Santa Rosa went to Bodega Bay to get clamshells and made their own bead money, but they bought magnesite cylinders from the east (Stewart, 1943, 53). The southern

Pomo also got arrowhead material when they went to the lake (Kniffen, 1939, 385-8). The Kacha Pomo of the north Russian River region were able to get obsidian in Potter Valley without cost. They also got specially made sinew-backed yew bows from the Elk River and Round Valley Indians. They were used as war bows or for big game and were made especially to suit the taste of the Russian River people. (Kniffen, 1939, 378)

COAST MIWOK

Traded clam shells and clam shell disk beads to the Pomo (Curtis, Vol. 13, 131, 257). See:--Wappo and Pomo.

MIWOK

Supplied to:

Paiute ----------	acorns (Taylor, H. J., 51); clam shell beads, baskets, arrows (Barrett and Gifford, 193, 224-5); manzanita berries, sow berries (Steward, 1933, 257)
Washo ----------	acorns, shell beads (clamshell), baskets (Ba (Barrett and Gifford, 193); redbud bark for weft and sewing material for production of geometric designs in baskets, bunch soap-root fibers used for brushing back scattered meal into mortar and for dressing hair, manzanita berries (Barrett, 1917, 14)
Yokuts ----------	baskets, bows and arrows (Barrett and Gifford, 270)

Received from:

Costonoan --------	the people of Monterey Bay allowed the Miwok to make journeys to get olivella shells (Barrett and Gifford, 251f)
North ----------	clam shell disk beads and a few magnesite cylinders (Curtis, Vol. 14, 131)
Paiute ----------	raw obsidian (Taylor, H. J., 51; Clark, G., 22-3); salt came in solid blocks from mines two days travel from foot of Mono Lake (Clark, G. 22-3; Barrett and Gifford, 1933, 255); obsidian points for arrows and fish spears (Curtis, Vol. 14, 131; Barrett and Gifford, 255); sinew-backed bows (Latta, 1929, 16); rabbit skin blankets, pinon nuts, buffalo skins (Barrett and Gifford, 193, 221, 255); pupae of certain kind of fly breeding on shores of Mono Lake, nuts of pinon pine, P. monophylla, which was considered superior to digger or sugar pines

(Clark, G., 44, 46); baskets, red paint, white paint (Steward, 1933, 257)

South (Yokuts?) ---------- olivella disk beads (Miwok usually imported but sometimes made own), not considered as valuable as clam shell beads (Barrett and Gifford, 252f)

Washo ---------- pinon nuts, salt, rabbit skin blankets, buffalo skins (Barrett and Gifford, 1933, 193, 221); dried fish from Lake Tahoe (Curtis, Vol. 15, 95)

Yokuts ---------- probably dogs as pups, rare (Barrett and Gifford, 1933, 270)

The Central Miwok in the foothills near Knights Ferry got digger pine nuts from people in the higher hills in exchange for certain seeds. They dried fish and traded them to the mountain people still higher up for salt. The Mountain Miwok produced the bows. It was the Mountain Miwok who traded with the Paiute. (Powers, 352).

WASHO

See: Maidu, Miwok

WEST MONO

Supplied to:

Paiute ---------- acorns, willowbark baskets, bead money (Gayton, 1948, 56, 159); besides these they furnished the Owens Valley Paiute with manzanita berries (Steward, 1933, 257) and salt (Steward, 1934, 437); buckskin, clam shell disk and tubular shell money, Yokuts baskets, canes for arrows, acorn flour, tobacco (Gayton, 1948, 228, 259)

Yokuts ---------- (foothill Yokuts) rabbit skin blankets, mocassins, rock salt, red and blue paint, and pine nuts which they got from the Paiute (Gayton, 1948, 159); Choinimni bought all sinew-backed bows from "Monachi" and took them back to the Monachi for repairs (Gayton, 1948, 146). Most Yokuts bows came from the Mono (Gayton, 1948, 73).

Received from:

Paiute ---------- rabbit skin blankets, moccasins, rock salt, red and blue paint, sinew backed bows, jerked deer meat, pine wood "hot rock lifters" (Gayton, 1948, 56, 15 159); nuts of digger pine, sugar pine,

METHODS OF RECORDING AND PRESENT STATUS OF KNOWLEDGE CONCERNING PETROGLYPHS IN CALIFORNIA[1/]

I. The Present Status of Petroglyph Research

The classic study by Julian Steward (1929) of the petroglyphs of California will form the basis for any future study of the decorated rocks of this state. As a compilation, the 130 petroglyph localities for which he presents data, represent approximately half the sites now known but his greatest contribution lies in the method by which he analyzed the data. This method consists in plotting the distribution of 45 single design elements chosen because they represent "types" of repeated occurrence. His results indicate that certain "elements have fairly well defined areal extent and a high degree of association. Moreover, they tend to group themselves according to general stylistic characteristics" (Steward, 1929, p. 55). In other words, the separate design elements behave like many other elements of culture and can be subjected to the same kinds of historical analysis. This simple demonstration establishes the usefulness of petroglyph data to historical anthropology and provides the justification for continued recording of newly discovered sites.

The map presented as figure 1[2/] represents the petroglyph localities now known in California and the areas of closely related petroglyph styles. The lines dividing the areas are in part arbitrary and some sites share features of adjacent areas. Many design elements, especially the more simple ones are widespread or nearly universal in their distribution, a few are limited to one or another area. Some of the designs of widespread distribution are illustrated in figure 2; numbers 21-40.

Area I is essentially that portion of California lying east of the crest of the Sierras. The area is characterized by pecked petroglyphs, generally of simple geometric forms. Individual design elements are usually small but the area covered by petroglyphs may be several acres in extent. Distinctive design elements include: Mountain sheep (fig. 2; 1), hand and foot prints (fig. 2; 2), snakes (fig. 2; 3), circle chains (fig. 2; 4), the circular grid (fig. 2; 5), "sheep horns" (fig. 2; 6), rectangular grids (fig. 2; 7), cross hatching (fig. 2; 8), angular meader (fig. 2; 9), bird tracks (fig. 2; 10), and "rain symbols" (fig. 2; 11).

Area II, the northern Coast Ranges, is characterized by rubbed groove petroglyphs of extremely simple forms occurring on the horizontal faces of boulders or exposed bedrock, usually of steatite. The most distinctive feature of this area is the occurrence of numerous artificial cup shaped depressions averaging three inches in diameter, and less than an inch deep. Petroglyph designs are elaborations of these cup shaped depressions (fig. 2; 12).

1./ In consonance with most recent writers, the word "petroglyph" is used to describe decorated rocks without differentiating between ornamentation produced by pecking and ornamentation produced by painting.

2./ Site locations are taken from Steward (1929) with additions from the manuscript by Clarence E. Smith.