

PLANTS USED IN BASKETRY BY THE  
CALIFORNIA INDIANS

BY

RUTH EARL MERRILL

# PLANTS USED IN BASKETRY BY THE CALIFORNIA INDIANS

RUTH EARL MERRILL

---

## INTRODUCTION

In undertaking, as a study in economic botany, a tabulation of all the plants used by the California Indians, I found it advisable to limit myself, for the time being, to a particular form of use of plants. Basketry was chosen on account of the availability of material in the University's Anthropological Museum. Appreciation is due the members of the departments of Botany and Anthropology for criticism and suggestions, especially to Drs. H. M. Hall and A. L. Kroeber, under whose direction the study was carried out; to Miss Harriet A. Walker of the University Herbarium, and Mr. E. W. Gifford, Associate Curator of the Museum of Anthropology, without whose interest and coöperation the identification of baskets and basketry materials would have been impossible; and to Dr. H. I. Priestley, of the Bancroft Library, whose translation of Pedro Fagés' *Voyages* greatly facilitated literary research.

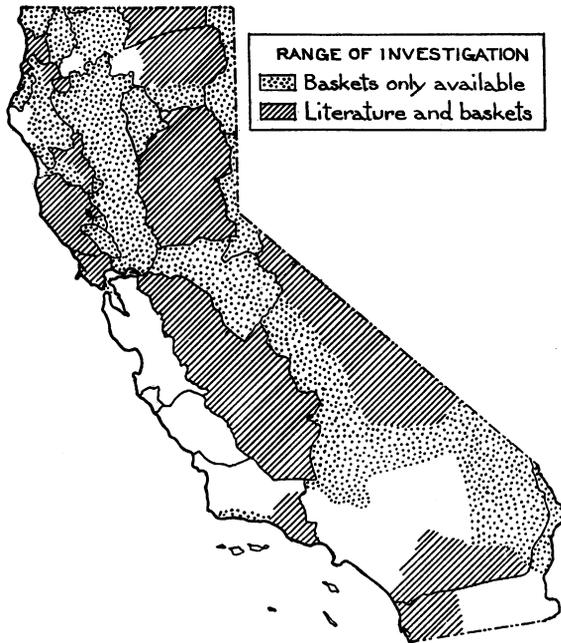
*Purpose of the study.*—There is perhaps no phase of American Indian culture which is better known, at least outside strictly anthropological circles, than basketry. Indian baskets are not only concrete, durable, and easily handled, but also beautiful, and may serve a variety of purposes beyond mere ornament in the civilized household. Hence they are to be found in our homes as well as our museums, and much has been written about the art from both the scientific and the popular standpoints. To these statements, California, where American basketry reaches its highest development, is no exception. Comparatively little attention has been paid, however, to the plant materials composing the baskets. Popular literature ignores them, or treats them so generally that the record is worthless for exact data; scientific papers, intent on weaves and designs, merely mention materials; while the few strictly botanical studies of plant fibers used in this way limit their scope to particular detached tribes. The

two-fold purpose of this study has therefore been not to present new material, since field work was impracticable, but, first, to gather and summarize what has already been written on the subject of plants used by the California tribes in basket-making, corroborating and supplementing these records from the baskets and prepared materials in the California collection of the University of California Museum of Anthropology; and second, to find what relation exists between the actual distribution of these plants and their use in basketry.

*Materials and method.*—The lists of plants gathered from literature of various sorts dealing with California Indians—travelers' accounts, botanical and anthropological treatises, and the like—formed a basis for analysis of the baskets. In many cases the collections include prepared materials. These were identified more or less positively by comparison with specimens in the University Herbarium, and their distribution plotted from Herbarium sheets and California floras. The Museum catalogue furnished data as to tribes and kinds of baskets, and frequently gave valuable information as to identity of materials, although in the latter respect it was not always reliable. The study has included identification of the materials of 1848 baskets representing thirty-seven tribes or groups and two general areas. Since most tribes use less than ten different basketry plants, all fairly distinctive and many common to several tribes, the analysis has not proved so formidable as at first glance it may appear.

*Difficulties.*—From the accompanying map 1 it will be seen that several considerable areas of the state are not represented either in literature or by specimens. It is probable that these "islands" of the extreme north and southeast do not differ materially in their basketry from surrounding tribes, but are substantially covered by the general literature on Northwestern and Southern California. It is of graver consequence that we have neither baskets nor records, except of the most general nature, from the coastal strip north and south of Santa Barbara county; for tribes here, early absorbed by the missions, have vanished with their basketry, and it is doubtful whether the blank can ever be filled. The fact that aboriginal baskets taken from a cave in the Santa Barbara interior and estimated to be over a century in age are identical in structure and material with present-day Cahuilla ware, points strongly to the use of the same plants in the intervening area; but there is no such clue to the usage between Point Concepcion and San Francisco bay.

A more fundamental difficulty lies in the great difference in available material for various tribes. The Museum collection shows only one Chimariko basket as against forty-seven from the slightly larger Hupa area; fourteen different plants are recorded as used by the Pomo in basketry, while the Wintun, occupying an area four times the size are dismissed with a few lines,<sup>1</sup> and nothing whatever has been written on the Miwok, whose collection of 125 baskets is one of the largest in the Museum.



Map 1

Moreover the materials in old, worn specimens, or even in unused bundles prepared for weaving, bear little resemblance to either the living plant or the carefully pressed herbarium specimen. Often identification must be from touch, texture, suppleness, size of pith, or other technical characters perfectly satisfying to one who has handled numbers of baskets, but utterly unbotanical. And even here there is abundant room for error, especially in dyed or otherwise treated materials. The peeled hazel and willow of Northwestern California, with their smooth surfaces, bear little resemblance to the scraped, angular withes of the Miwok. Black dyes vary so in intensity

<sup>1</sup> Kroeber, A. L., 1905, p. 143.

and permanence that they can hardly be identified in finished baskets except by inference from the locality and the material dyed, while the alder red is unmistakable and, so far as I know, is never applied to anything but the stems of *Woodwardia*. Again, in the pitched water-bottles of the Cahuilla and Chumash, and in all fine twined or coiled work, it is practically impossible to positively identify the warp or foundation without undue mutilation of the basket.

*Conclusions.*—In spite of these difficulties, the amount of material, both written and actual, that has been handled seems to warrant a discussion of basketry plants of the state as a whole. The results of the first line of attack, statistical in nature, comprise the appendix, and it is hoped that future investigations will round it into a complete list of basketry plants used in this state. The more theoretical problem of whether the selection of basket materials depends on their distribution or on the technique employed has not resolved itself so easily. What the chief fibers are, how their geographical distribution compares with that of their use, what conclusions may be drawn, and what remains still in question, it is the purpose of this paper to discuss.

#### CALIFORNIA BASKETRY

*Plant materials.*—Seventy-eight different species of plants representing thirty-six families have been identified among the basket materials of California tribes, a remarkably small number in the total flora of the state and in the list of plants used by the Indians, whose faculty of turning everything in their natural environment to some purpose is well known. When we recall that many of these plants are used only slightly, or in restricted areas, the range of choice becomes still narrower.

*Parts used.*—There seem to be no portions of the plant, however, which do not sometimes serve as basket materials. Alder, fern and tule roots, young shoots of willow and hazel, bark and sapwood of redbud, culm of *Epicampes* and *Phragmites*, leaf of the fan palm, pod of the Devil's horns (*Martynia*), water lily seed, and even pitch from *Pinus monophylla* all have their place. Sometimes but a small portion of the whole plant is used, as the roots of the various coniferous trees, which form the woof of most twined baskets in the Northwest. Or three different parts of the redbud (*Cercis occidentalis*) may entirely compose a Maidu cooking basket. There are also Klamath baskets in which warp, woof, and three different pattern elements are all of tule (*Scirpus lacustris occidentalis*).

*Preparation.*—Some plants, such as the grass, *Epicampes rigens*, which forms the foundation in southern California coiled baskets, are always used in their natural state, or merely dried and stored until needed. In the large willow storage baskets of the Cahuilla, the leaves are not even stripped from the stems which form both the indeterminate warp and woof. Most materials, however, require some elaboration. Except in the rougher twined baskets, bark is removed from willow, hazel, or redbud withes, either by peeling with the teeth when it is loose in spring, leaving a smooth surface; or by scraping, which produces a rough, angular one. Conifer and sedge roots are split into flat strands. The white sapwood of the redbud and willow are also split off from the red outer bark, which is used for patterns, and from the pith. Among the Yurok maidenhair fern stems are pounded with a stick until they break apart into long flat strands. Dyeing may be accomplished by boiling, as in the blackening of *Pteris aquilina* and Redbud bark; by soaking in an infusion, by which means *Juncus* is dyed black in *Suaeda*, and yellow in *Parosela*; by chewing with the dyeing material, as the Hupa chew stems of *Woodwardia* with alder bark to redden them; or by blackening through simple burial in mud and ashes, which is the method having the widest distribution among the California tribes, although not the most effective, nor in all cases the most popular. Among the Klamath, shells of water-lily seeds, containing tannin, are mixed with the mud, and the blackening is the result of chemical action.<sup>2</sup>

*Technique.*—Two principal types of weave are found among the California baskets. One is the coiling of the southern tribes and the Pomo, in which one element, the *foundation*, coils around upon itself, each layer being fastened to the one below by stitches of a second element known as the wrapping. The foundation varies from a single stem among the Pomo to a bunch of many grass stalks among the Cahuilla. With the Yuki, the dogwood foundation is usually overlaid with flat strands or welts of the wrapping material. Where the wrapping of coiled work is close, a fine basket results, in which the foundation cannot be seen. The Diegueño make coarse plates with widely separated stitching, but in no case are true open-worked baskets made in this style. Twenty-one tribes practice coiling and twining, while fourteen make twined baskets only. In twining, the foundation or warp elements radiate from a common center, and the thread or woof which is usually double, occasionally triple, and in the Northwest

<sup>2</sup> Coville, F. W., 1905, p. 32.

often double with a separate overlay or facing for each strand, interlaces between the warp sticks. When the woof is single, the process is wicker-work instead of twining, but this weave is very rare in California. The Klamath, with their two-strand twisted tule, are the only tribe using a multiple warp in twining. This is because their warps are of the nature of pliable string rather than rods. The Pomo and some neighboring tribes make a few baskets by coiling, as it were, on a foundation of twining. This, the so-called lattice twine, makes a doubly strong basket. The materials do not differ from those used in the ordinary weaves.

*Patterns.*—Decoration of some sort is universal, although its elaborateness varies with the tribe, individual maker, and type of basket. The Panamint designs are often crude or lacking, while the neighboring Tübatulabal generally decorate their better baskets most beautifully. There are in the Museum several Wiyot baskets of extremely simple pattern made by a blind woman, in which the personal factor is obvious. Again, openwork seedbeaters and winnowers are as a rule without decoration, but the Washo make patterns on these articles by turning the bark side of the woof and producing an alternation of red (redbud bark) or brown (willow bark) with the white sapwood of the same plant. In most coiled basketry, and in the twined work of the Klamath, Yana, and Wintun tribes, the contrasting color takes the place of, or is passed over, the woof strand, and thus appears on both inner and outer surface. The Northwestern tribes, on the contrary, use the pattern material as a facing of the main strands of the woof, and by failing to twist at each stitch, keep the underlying woof always either covered or exposed only on the outer surface of the basket, no pattern being visible on the inner side.

*Colors.*—Five colors, black, brown, yellow, red, and white, with their various intergrading shades, occur as patterns in California baskets. In the close-twined work of the northwestern tribes, where conifer root is the almost universal woof, the white leaves of *Xerophyllum tenax* form the most popular pattern on the dark brown background of cooking baskets, or in the fine hat baskets cover it completely to provide a light groundwork on which designs are worked in the black of maidenhair fern stems, the red of *Woodwardia spinu-losa* dyed with alder bark, and occasionally strips of *Xerophyllum* dyed yellow in an infusion of the lichen *Evernia vulpina*. White is also the favorite contrasting color with the Indians of Klamath lake. One coiled basket showing white stitches of *Rhus trilobata* on the

greenish *Juncus* wrapping was noted from the Cahuilla; but with these exceptions white is not used in designs because the warp or wrapping—willow, redbud, sedge, or *Rhus*—used over the greater part of the state is itself white.

Yellow is not widely used. At most, in the north it occurs in thirty-one Klamath baskets out of a total of over two hundred. Here the material is porcupine quills in place of *Xerophyllum*, the same dye, *Evernia*, being used; or, very rarely, tule leaf, aged to yellow, forms the pattern. In southern California a yellow dye from *Parosela emoryi* is used to color strands of *Juncus acutus*, and was found in 42 per cent of all the baskets examined. Yellow is totally lacking throughout central California, where red and black predominate.

Red occurs in both natural and dyed materials. Alder bark gives what is really a reddish brown. The Klamath Indians rarely dye tule or porcupine quills a bright pink in the root of an unknown plant. The fiber most widely used for red patterns is redbud bark (*Cercis occidentalis*) gathered during the rainy season<sup>3</sup> when it is of a rich permanent color. It is readily distinguishable by its many white lenticels from willow bark (*Salix* sp.) which is sometimes used in the same way, and from yucca root bark (*Yucca mohavensis*) which forms the red design from the Panamint southward.

Black is the most widely distributed color, being used by thirty-one of the thirty-seven tribes, and predominant in eleven. The natural black materials are the shining stems of various ferns, the maidenhair or its substitute, the golden-back fern,<sup>4</sup> throughout the north, except among the Klamath where the ever present tule furnishes black or red roots for this purpose; the dull sedge root bark figuring wherever the root is used as a wrapping; and the intense black of split *Martynia* pods found among the Mono, Koso, Kawaiisu, Kitanemuk, and Tübatulabal. Artificial blacks are obtained by various means. Burying of warp or woof elements in mud and ashes is practiced by the northern tribes; the Pomö use the juice of poison oak (*Rhus diversiloba*);<sup>5</sup> the Concow Maidu, infusion of oak bark (*Quercus lobata*) with rusty iron;<sup>6</sup> the Cahuilla,<sup>7</sup> Diegueño, Luiseño, and Chumash used *Suaeda suffrutescens* on the rush (*Juncus acutus*) and juice of elderberries (*Sambucus* sp.) for blackening sumach splints.<sup>8</sup> Blackberries (*Rubus vitifolius*) are also used by the Luiseño<sup>9</sup>

<sup>3</sup> Merriam, C. H., 1903, p. 826.

<sup>7</sup> Barrows, D. P., 1900, p. 43.

<sup>4</sup> Chesnut, V. K., 1902, p. 303.

<sup>8</sup> Barrows, D. P., 190, p. 43.

<sup>5</sup> Coville, F. W., 1905, p. 36.

<sup>9</sup> Sparkman, P. S., 1908, p. 232.

<sup>6</sup> Coville, F. W., 1905, p. 35.

as a non-permanent blackening agent. Roots of the brake fern (*Pteris aquilina*) turn deep black upon boiling, and form the chief black pattern material among the Washo, Miwok, Mono, and Yokuts, and their use extends northwest to the Pomo and south to the Kawaiisu. In a few baskets<sup>10</sup> redbud bark, blackened by soaking with oak bark and old iron, forms black designs.

The untreated root of *Pteris aquilina* is the only strictly brown pattern material, but redbud, yucca, and carex root bark vary toward brown, as do all the dyed fibers, either through usage of the article or insufficient dyeing.

*Other pattern materials.*—A few tribes depend wholly or in part on other than plant materials for decorating their baskets. Porcupine quills have been mentioned in the Klamath designs. Feathers, chiefly yellowhammer quills or quail plumes, occur rarely among most tribes, and the Pomo use feathers in the patterns of their finer baskets to the exclusion of plant fibers. Their modern baskets are also beaded, as are those of the Wappo. Of other materials obtained through contact with the whites, such as colored cloth, and the red worsted so common in Miwok and Yokuts "bottle-neck" vessels, more will be said in another connection.

*Accessory materials.*—On the larger cooking baskets of the Northwest area, and in general on those which must undergo a strain, such as mortar hoppers, cradles, and carrying baskets, extra bands of a strengthening nature are fastened. The bands are usually of the same material as the warp or foundation, but sometimes of willow, whose pliability, when green, fits it better than the tougher redbud or more brittle hazel for bending into a hoop, especially when stout branches are used. The bindings for such hoops may be of the woof itself, as is customary among the Tolowa and Hupa; of the pattern material, as the Yana use redbud and *Xerophyllum*, or of a special binding material not otherwise employed in the basket, but serving as rope or cord in other departments of life. Grape stems (*Vitis californica*) are most used in this capacity. Of nine tribes in which binding materials were noted, only three did not use grape. The Klamath

<sup>10</sup> One Yuki, five Maidu. The root of *Scirpus maritima* is given by Barrett (1908, pp. 137, 140) and Purdy (1902, p. 15) as being dyed in mud and ashes for a black pattern element among the Pomo, and by Coville (1905, p. 38) among the Panainint. The black roots in the Museum collection identified as *Carex barbarae*, and so given by Barrett as a wrapping material (1908, p. 140), are certainly identical with the pattern material in most Pomo baskets, but could not be associated with herbarium specimens of either of these species.

bind the rims of nearly all their fine cooking bowls, as well as the coarse burden baskets, with a gray nettlebark string (*Urtica breweri*), which is also used as weft in beginning these baskets.

*Waterproofing*.—Practically all closely woven baskets of both weaves are water-tight. Certain southern tribes, however, render their basketry water-bottles more impervious by pitching them inside with asphaltum (Chumash) or with gum from *Pinus monophylla* (Panamint). A similar practice of slightly different application is the making of conical carrying baskets seed tight among the Yokuts and Miwok by an external application of hot soaproot juice (*Chlorogalum pomeridianum*), which hardens into a thin, brittle sheet. It is possible that both these adaptations mark a transition stage between basketry, which is most highly developed in the northwest, and the related art of pottery, which takes its place from the arid Southeast into Mexico.

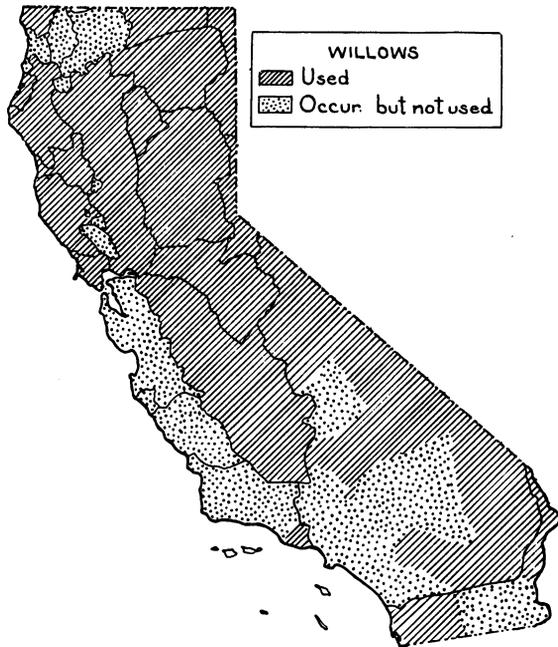
#### THE CHIEF BASKETRY PLANTS IN RELATION TO DISTRIBUTION

*Theory*.—In general, plants are used where they occur. There are, of course, a few exceptions to this rule. Chesnut<sup>11</sup> states that long stems of *Smilax californica* are brought by the Mendocino county Indians from the Sacramento watershed for use in basketry. The Museum collection of Miwok materials contains a roll of shining red willow bark whose only identification was that it "came from the Mono country;" and there is a Yurok basket with a yellow design in porcupine quills, yet that animal is not found within their territory. But these are exceptional cases, since from the nature of things, plants must occur in sufficient quantity and within convenient reach in order to be popular basket materials. The real question is whether or not distribution is the deciding factor in the choice of basketry materials by a given tribe.

*Evidence*.—In support of such a conclusion, the Klamath and Modoc furnish a ready example. The entire culture of this people has been built around the fact of their location on the tule marshes of the Klamath lakes. Their clothing, literally from head to foot, their canoes, their household furnishings, including baskets of every description, are constructed wholly or in part of the leaves, stalks, or roots of this one plant (*Scirpus lacustris*, var. *occidentalis*). These

<sup>11</sup> Chesnut, V. K., 1902, p. 329.

baskets have many advantages: they are light, perfectly flexible, and therefore able to stand usage at least as well as the stiffer ware of the northwest area whose warp is of resistant twigs. Moreover, in the midst of a group which has carried the technique of firm coiling to its farthest extent, we find the Clear Lake or Eastern and Southeastern Pomo, in surroundings similar to the Klamath swamps, also using tule for basketry and furniture to a considerable degree. Yet these two areas are the only ones in which tule is used to any extent, although it occurs in fresh and salt water marshes throughout the state<sup>12</sup> and often in large quantities.

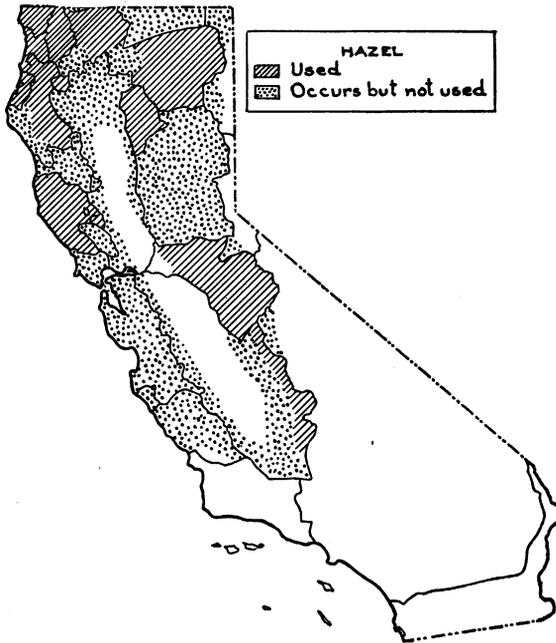


Map 2

Undoubtedly the single genus most widely used in one way and another among tribes is the willow (*Salix* sp.). Among tribes practicing coiling, sixteen use it for foundation and six for wrapping; it is used as warp by nineteen tribes (the chief warp material in thirteen) and as woof in eighteen. In addition to the function of hoop and rim binding mentioned above, willow bark serves definitely as a pattern material for six central tribes, and indirectly, by the alternation of peeled and unpeeled withes, in many others. In but five tribes from which the collections may be considered complete is willow

<sup>12</sup> Jepson, W. L., 1901.

wholly lacking as a basket element. Of these, the Chumash, Diegueño, and Luiseño make even their coarse twined baskets of the same *Juncus* or *Rhus* which they employ in coiled work, while the Tolowa and Hupa use hazel, the universal warp of the Northwestern area. Yet willow grows in the territory covered by each of these tribes (Map 2), so that their failure to use it must be due to the possession of a better or preferred material.



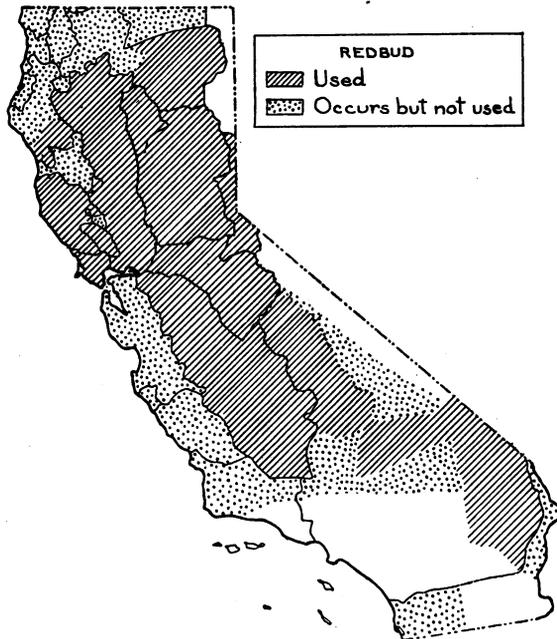
Map 3

The use of hazel (*Corylus rostrata* var. *californica*) as a warp element in twined basketry would seem to bear out this view. Among ten of the twenty-one tribes where it is employed there is no other warp. But its actual distribution, while much more restricted than that of the willows, is far wider than its use<sup>13</sup> (Map 3).

Taking up more specialized materials, it has been noted that white patterns in the northwest are universally executed in *Xerophyllum tenax*, with one exception, the Lutuami, who use split stems of the

<sup>13</sup> Barrett, S. A., 1908, p. 138, says that so far as he could determine no preference is shown by the Pomo for one species of willow rather than another. It is probable that this applies to other tribes as well, and that all willows, with the exception of dwarf alpine forms, have the qualities essential to basketry in sufficiently equal proportion to warrant their consideration in this respect as a genus rather than as separate species.

white reed, *Phragmites vulgaris*. Of the two, *Xerophyllum* is certainly the better material, being finer, more flexible, and more durable because it does not crack so easily as the reed. It also grows on Klamath Lake reservation. The obvious explanation for the use of *Phragmites* in preference to *Xerophyllum* is that the former grows on the lake shores along with the chief Klamath and Modoc basket material, tule. Here distribution is secondary to convenience as a determining factor.



Map 4

Another pattern element, of wider usage, is redbud (Map 4), important as foundation and wrapping, but more important for ornamentation. It is far more easily prepared than the alder-dyed *Woodwardia*, which supplants it in the northwest. It is difficult to account for its entire absence from baskets of southern California make, since the herbarium shows specimens from San Diego county; but it may be that the dry climate fails to develop a bright red color in the bark.<sup>14</sup>

The restriction of such materials as *Martynia louisiana*, *Yucca arborescens*, and *Washingtonia filifera* to the desert tribes, and of the lichen, *Evernia vulpina*, to the heavily forested areas is of course due

<sup>14</sup> See Merriam, C. H., 1903, p. 826. This point could not be determined, since neither the trees cultivated in the University of California botanical garden nor the herbarium specimens show anything like the decided red bark of the prepared material or basket patterns.

to their limited range and comparative rarity. But *Rhus trilobata* (Map 5), with practically the same usage, is found throughout the state. By way of comparison it might also be said that although porcupines, whose dyed quills are widely used in Klamath baskets, do not occur in the Coast Ranges where yellow patterns are of *Xerophyllum* similarly treated, these animals are sufficiently numerous in the Sierras to furnish quills for the Maidu, Yana, Miwok, and other tribes, who not only do not use them, but have no substitute.

TABLE- 1

## RELATION OF USAGE TO DISTRIBUTION OF BASKETRY PLANTS

<i>Distribution much exceeding use</i>	<i>Distribution little exceeding use</i>	<i>Imported materials</i>
1. <i>Rhus diversiloba</i>	1. <i>Corylus rostrata californica</i>	1. <i>Picea sitchensis</i>
2. <i>Rhus trilobata</i>	2. <i>Alnus rubra</i>	2. <i>Smilax californica</i>
3. <i>Berberis nervosa</i>	3. <i>Scirpus lacustris occidentalis</i>	3. <i>Sequoia sempervirens</i>
4. <i>Alnus rhombifolia</i>	4. <i>Juncus effusus</i>	
5. <i>Lonicera interrupta</i>	5. <i>Cercis occidentalis</i>	
6. <i>Suaeda suffrutescens</i>	6. <i>Washingtonia filifera</i>	
7. <i>Avena fatua</i>	7. <i>Xerophyllum tenax</i>	
8. <i>Phragmites vulgaris</i>	8. <i>Pinus monophylla</i>	
9. <i>Epicampes rigens</i>	9. <i>Salix spp.</i>	
10. <i>Pinus lambertiana</i>	10. <i>Acer macrophyllum</i>	
11. <i>Pinus ponderosa</i>	11. <i>Evernia vulpina</i>	
12. <i>Pinus sabiniana</i>	12. <i>Parosela emoryi</i>	
13. <i>Chloragalum pomeridianum</i>	13. <i>Yucca brevifolia</i>	
14. <i>Pseudotsuga taxifolia</i>	14. <i>Yucca mohavensis</i>	
15. <i>Jumiperus occidentalis</i>	15. <i>Agave deserti</i>	
16. <i>Ceanothus integerrimus</i>	16. <i>Juncus acutus</i>	
17. <i>Rubus vitifolius</i>	17. <i>Sambucus mexicana</i>	
18. <i>Populus trichocarpa</i>		
19. <i>Torreya californica</i>		
20. <i>Typha latifolia</i>		
21. <i>Vitis californica</i>		
22. <i>Psoralea macrostachya</i>		
23. <i>Philadelphus gordonianus</i>		
24. <i>Scirpus robustus</i>		
25. <i>Juncus balticus</i>		
26. <i>Artemisia ludoviciana</i>		
27. <i>Martynia proboscidea</i>		
28. <i>Ceanothus integerrimus</i>		
29. <i>Ceropteris triangularis</i>		
30. <i>Adiantum pedatum</i>		
31. <i>Pteris aquilina</i>		
32. <i>Woodwardia spinulosa</i>		

*Conclusion.*—From such cases as these, summarized in the accompanying table, we are forced to conclude that most basket materials have a wider range than their use and that geographic distribution

is therefore not the controlling factor in their selection. However this point cannot be regarded as conclusive without such evidence as to availability and abundance of plants as can only result from extensive field work along botanical as well as anthropological lines.

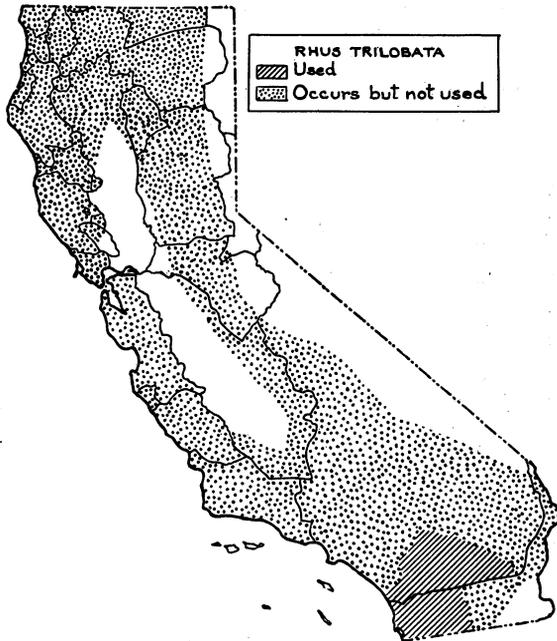
#### THE CHIEF BASKETRY PLANTS IN RELATION TO WEAVES

*Theory.*—If the availability of certain plants cannot be regarded as the reason for their use, the most obvious hypothesis is that technique of manufacture is the governing factor. If this is true we may expect to find the same or equivalent materials in use wherever a certain weave is found.

*Distribution of weaves.*—It has already been stated that two weaves, coiling and twining, are practiced in California. It is hardly correct, however, to use these terms as equivalents in determining basketry plants. Conditions will be much more fairly represented by the statement that openwork twining is universal in the state for coarse baskets—fish traps, cradles, burden baskets, and winnowers—while other articles—cooking, hat, plate, mortar baskets, etc.—are made either in coiled work or close twining. The latter is (1) the sole weave employed among a group of some thirteen tribes in the north of the state, and (2) extends alongside of coiling to the Diegueño, being more and more superseded in importance by the coiled technique among the southern tribes.

*Requirements and materials of openwork twining.*—The coarse twined baskets, apparently the simplest as to weave and material, are made for hard usage, requiring both strength and lightness, and, where both warp and woof are of the same material, a certain degree of flexibility. Four chief materials are employed in openwork baskets: hazel, on the northwest coast; tule, at Klamath and Clear Lakes (Pomo); a rush (*Juncus acutus*) among the southern coast tribes; and willow, to a greater or less extent among almost all tribes. *Juncus* and tule are the lightest and most flexible materials, but lack the strength and support found in twigs. This is recognized in the fact that the tribes employing these materials also make openwork baskets, notably winnowers and seed beaters, of willow, juniper (Lutuami), and *Rhus trilobata* (Cahuilla). Hazel is a most admirable material as to lightness, but on account of its large pith is not so strong as willow. The wide use of willow in this style of weave supports the theory that plant materials are selected for their adaptability to a certain technique, the use of other plants being influenced by the materials used in the prevailing close type of weave.

*Requirements and materials in coiling and twining.*—Close twining demands a rigid warp material and a very flexible woof. Among the Lutuami both are flexible, but even here an attempt at simulating stiffer materials is found in the double warp. The resulting baskets hold their shape, but may be bent by pressure. The coiled weave, on the contrary, in which the single foundation strand is exceptional, requires that both foundation and wrapping be capable of bending, although the basket so made is perfectly rigid. Therefore we might



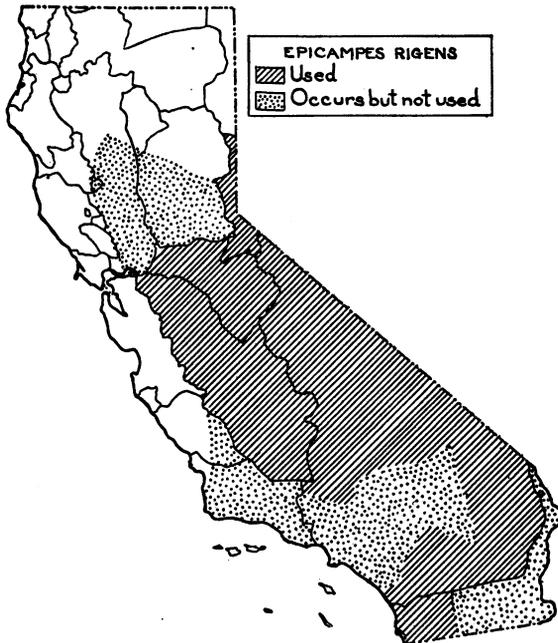
Map 5

expect to find the same plants used for wrapping and woof, but the foundation more flexible than warp materials. That such is not the case appears definitely from the appended table showing the distribution of the chief materials according to weave in each of nineteen tribes practicing both coiling and close twining. In only nine cases, or barely one-half the total, are different materials used for foundation and warp, and in three of these, marked with an asterisk, the foundation is less flexible than the corresponding warp. Moreover, the wrapping and woof materials in these areas show exactly the same ratio, yet from the requirements of the weave there is no reason why they should not be the same.

TABLE 2  
CHIEF MATERIALS IN COILED AND CLOSE TWINED WEAVES

Tribe	Foundation	Warp	Wrapping	Woof
1. Wailaki	*Salix sp.	<i>Corylus rostrata californica</i>	<i>Cercis occidentalis</i>	<i>Pinus sabiniana</i>
2. Kato	Salix sp.	Salix sp.	<i>Cercis occidentalis</i>	Salix sp.
3. Yuki	*Cornus sp.	Salix sp.	<i>Cercis occidentalis</i>	Salix sp.
4. Wappo	Salix sp.	Salix sp.	<i>Carex barbarae</i>	<i>Carex barbarae</i>
5. Pomo	Salix sp.	Salix sp.	<i>Carex barbarae</i>	<i>Pinus ponderosa</i>
6. Wintun	Salix sp.	Salix sp.	<i>Cercis occidentalis</i>	<i>Pinus sp.</i>
7. Yana	<i>Corylus rostrata californica</i>	<i>Corylus rostrata californica</i>	<i>Cercis occidentalis</i>	Salix sp.
8. Maidu	Salix sp.	Salix sp.	<i>Cercis occidentalis</i>	<i>Cercis occidentalis</i>
9. Washo	* <i>Cercis occidentalis</i>	Salix sp.	<i>Cercis occidentalis</i>	Salix sp.
10. Miwok	Salix sp.	Salix sp.	Salix sp.	Salix sp.
11. Yokuts	<i>Epicampes rigens</i>	Salix sp.	<i>Carex barbarae</i>	Salix sp.
12. Mono	<i>Epicampes rigens</i>	<i>Cercis occidentalis</i>	<i>Cercis occidentalis</i>	<i>Cercis occidentalis</i>
13. Tubatulabal	<i>Epicampes rigens</i>	Salix sp.	Salix sp.	Salix sp.
14. Kawaiisu	<i>Epicampes rigens</i>	Salix sp.	Salix sp.	Salix sp.
15. Panamint	Salix sp.	Salix sp.	Salix sp.	Salix sp.
16. Chemehuevi	Salix sp.	Salix sp.	Salix sp.	Salix sp.
17. Chumash	<i>Juncus acutus</i>	<i>Juncus acutus</i>	<i>Juncus acutus</i>	<i>Juncus acutus</i>
18. Cahulla	<i>Epicampes rigens</i>	<i>Juncus acutus</i>	<i>Rhus trilobata</i>	<i>Juncus acutus</i>
19. Diegueño	<i>Epicampes rigens</i>	<i>Juncus acutus</i>	<i>Rhus trilobata</i>	<i>Juncus acutus</i>

*Conclusion.*—On the whole there appears to be a decided grouping of plant materials, not by function in the basket, but by areas, although not according to geographical distribution except in a general way. Thus while the grass *Epicampes rigens* is the chief foundation south of San Francisco (Map 6), and willow in northern coiled ware, both occur almost throughout the state; and the presence of three-rod foundations in ornamental Pomo baskets, and of one-stick



Map 6

baskets among the Panamint, who largely use bunches of *Epicampes* in coiling, precludes the decision that the practice of using a multiple foundation in the south, and single rods in the north, is entirely responsible for this division. It is hardly necessary to say that the lines that run longitudinally through the state separating linguistic stocks have nothing to do with the question, since they coincide with neither the divisions of plant materials nor of weaves. The evidence, then, shows even less influence of basic technique than of floral distribution on the choice of basketry plants.

## SUGGESTIONS IN CONCLUSION

*Other influences.*—Although in this study the two theories discussed have been chiefly held in mind, several other influences, such as tradition, the customs of adjoining tribes, and civilized conditions, have been noticed as of possible significance in the selection of basketry materials.

*Tradition.*—Sparkman<sup>15</sup> says of the Luiseño: "No model is ever used, except possibly of late years occasionally, and no two baskets are ever exactly alike." Notwithstanding this, it is safe to say that tradition plays an important, if not the most important, rôle in determining basket materials used at present by any tribe, as it undoubtedly does in the distribution of patterns and their arrangement. The ancient Chumash bowls and plates deposited in the Museum by the U. S. Department of Agriculture can hardly be distinguished from modern Luiseño and Cahuilla baskets in form or materials. In a more general way, the specialization of certain materials for a particular part of the basket is traditional. *Agave deserti* is customarily used by the Cahuilla to begin the foundation in coiling but never continues throughout the basket; strips of *Washingtonia filifera* appear, like *Juncus acutus*, as wrapping, but never, like the rush, form the foundation; the red dye of alder bark is applied to no plant fiber except stems of the fern, *Woodwardia*. The complete absence of willow as a warp material from older Hupa baskets is said to be due to superstition regarding the plant.<sup>16</sup> It may be that this element is a factor in other materials and tribes. The influence of tradition cannot carry us back to the origin of use or disuse, but it is certainly of value in explaining present usage.

*Adjacent tribes.*—Basketry is further influenced to some extent by the sort of work done by surrounding tribes. This is most noticeable where several distinct peoples are thrown together on a single reservation. Baskets made by the Northern Paiute on Klamath Lake reservation do not differ in form or materials from those of the Klamath and Modoc Indians who are at home there. The Wappo have so adopted the Pomo type of basket that their handiwork cannot be distinguished from it. On the other hand, eight Concow Maidu baskets from Round Valley reservation preserved perfectly the Maidu type, showing no indications, at least in choice of plant materials,

<sup>15</sup> Sparkman, P. S., 1908, p. 204.

<sup>16</sup> Goddard, P. E., 1903, note, p. 39.

of influence from the Pomo or Yuki, among whom the Concow have been transplanted for sixty years. Even in their own territory tribes show signs of external influence. No better example can be mentioned than the practical uniformity in basket materials which makes possible the grouping together of basketry from a dozen small adjacent tribes under the single term "Northwestern type." The Achomawi (Pit river Indians) use the tule and *Phragmites* of their northern neighbors, the Lutuami; the hazel and *Xerophyllum* of the Northwest type; and redbud bark which is used by neither, but found among the Maidu to the south. It must be noted that the various materials are borrowed *en masse*, the tule baskets being embroidered strictly with tule root, and the hazel-conifer root baskets with maidenhair fern. Less striking is the transition from redbud bark to yucca root as a red pattern material. Yucca is used only among the most southern tribes of the Yokuts; and of thirty-seven Mono baskets in the twined weave, representing the more northern type, every red pattern was in redbud, while out of twenty coiled baskets (the southern weave) having red designs, fourteen were in yucca and only six in redbud. These facts indicate that while generic types of weaves and materials are unassociated, particular techniques may be definitely connected with particular materials.

*Civilization.*—The fact that since contact with the whites practically every tribe includes manufactured materials in some of its baskets is valuable in this connection only as it shows that among savage as well as civilized peoples new materials may be introduced and gradually find a place, even to supplanting the old. So the fringe of red worsted characteristic of Miwok and Yokuts "jars" must have taken the place of feathers, and among the Wappo, colored glass beads have supplanted the laboriously ground ornaments of clam and abalone shell. Barrows<sup>17</sup> tells us that the Cahuilla woman now uses a sharp nail as an awl where she formerly used a cactus thorn set in a manzanita handle. Cotton string is frequently met with in Lutuami basketry in place of, or occasionally along with, the cord of native nettle bark (*Urtica breweri*). It is even said that a roll of Japanese straw matting, carefully unraveled, has been used in basketry by this tribe, although no baskets made of it were found, showing that, after all, innovation is extremely slow and cautious, and that if any of the present basket materials came into use through introduction from without, they must have proved their merit through prolonged trial.

<sup>17</sup> Barrows, D. P., 1900, p. 42.

*Conclusion.*—Finally, although the usage of these seventy-odd plant species is not due entirely to their distribution, nor to their suitability from the standpoint of technique in weaving, nor primarily to any one of the influences suggested by this study, we may conclude that basketry, with its selection of plant materials in California, is at present a rigid art, which has been developed by each tribe or group of tribes within its own environment through a combination of influences; an art which may be lost in time by removal from these influences; and which, like all living things, has progressed, and is progressing, by gradual adoption of whatever new materials offer advantages over the old.

## APPENDIX

## LIST OF BASKET MATERIALS

*According to Part, Use, and Tribe*

## Amaryllidaceae

*Agave deserti*. Desert agave. Leaf: foundation,<sup>18</sup> Cahuilla, Diegueño.

## Anacardiaceae

*Rhus diversiloba*. Poison oak. Stem: warp, Panamint, Wintun; woof, Panamint; foundation, Pomo. Juice: black dye, Pomo.

*Rhus trilobata*. Squaw bush. Stem: warp, woof, and wrapping, Cahuilla, Diegueño, Luiseño, Panamint; foundation and wrapping, Chumash.

## Berberidaceae

*Berberis aquifolium*. Barberry. Root: yellow dye, Hupa.

*Berberis nervosa*. Oregon grape. Bark: yellow dye, Hupa.

## Betulaceae

*Alnus rhombifolia*. White alder. Bark: red dye, Hupa, Whilkut, Nongatl, Sinkyone, Yurok, Karok, Shasta, Achomawi, Wintun, Yuki, Pomo.

*Alnus rubra*. Red alder. Root: woof, Hupa,<sup>19</sup> Whilkut, Nongatl, Lassik, Wailaki, Yurok, Wiyot, Pomo; brown pattern, Whilkut.

*Corylus rostrata californica*. Hazel. Stem: warp and woof, Tolowa, Hupa, Whilkut, Chilula, Lassik, Sinkyone, Wailaki, Wiyot, Achomawi, Atsugewi, Yana, Pomo, Yuki; warp, Chimariko, Karok, Miwok, Yokuts; rim hoop, Lassik, Wailaki; foundation, Yana, Miwok. Stem (dyed): black pattern, Tolowa, Hupa, Wailaki, Yurok, Wiyot.

## Calycanthaceae

*Calycanthus occidentalis*. Calycanthus. Stem and bark: Pomo.

## Caprifoliaceae

*Lonicera interrupta*. Honeysuckle. Stem: foundation, Yuki.

*Sambucus mexicana*. Elderberry. Stem: black dye, Cahuilla.

*Sambucus* sp. Elderberry. Stem: black dye, Cahuilla, Diegueño, Luiseño, Agua Caliente.

## Chenopodiaceae

(*Dondia suffrutescens*. Sea-blight. Stem: black dye, Cahuilla.)<sup>20</sup>

(*Suaeda diffusa*. Sea-blight. Whole: black dye, Cahuilla,<sup>21</sup> Southern California.)<sup>22</sup>

(*Suaeda suffrutescens*. Sea-blight. Whole: black dye, Cahuilla.)<sup>23</sup>

*Suaeda suffrutescens*. Sea-blight. Whole, black dye, Cahuilla, Chumash, Luiseño, Diegueño.

<sup>18</sup> At beginning only.

<sup>19</sup> *A. oregana*, Goddard, P. E., 1903, p. 39.

<sup>20</sup> Coville, F. W., 1905, p. 27 = *Suaeda suffrutescens*.

<sup>21</sup> Palmer, Edward, 1878, p. 653 = *Suaeda suffrutescens*.

<sup>22</sup> James, G. W., 1904, p. 14 = *Suaeda suffrutescens*.

<sup>23</sup> Barrows, D. P., 1900, p. 43 = *Suaeda suffrutescens*.

## Compositae

*Artemisia ludoviciana*. Wormwood. Stems: warp and woof,<sup>24</sup> Cahuilla.

## Cyperaceae

*Carex barbarae*. Slough grass. Root: wrapping, Yuki, Wappo, Pomo, Miwok, Yokuts, Mono, Panamint, Kitanemuk; woof, Pomo, Yokuts, Mono; foundation,<sup>25</sup> Pomo. Root bark, black pattern, Yuki, Wappo, Pomo, Mono.

*Carex Mendocinensis*. Sedge. Root: wrapping, Pomo.

*Carex* sp. Sedge. Root: wrapping, Washo, Pomo, Wailaki, Yokuts, Tübatulabal; woof, Pomo. Rootstock: woof, Mendocino County.

*Cladium Mariscus*.<sup>26</sup> Cladium. Root: wrapping, Yokuts.

*Scirpus lacustris occidentalis*. Tule, Leaf: warp, Lutuami (Klamath and Modoc), Achomawi; warp and woof, Pomo, Yokuts, Paviotso, Ventura; woof, Achomawi; woof and rim binding, Lutuami (Klamath and Modoc); leaf (dyed), black pattern, and leaf (aged) yellow pattern, Lutuami (Klamath and Modoc). Root: black pattern, Lutuami (Klamath and Modoc); leaf (dyed) and root, black pattern, Achomawi.

(*Scirpus maritimus*. Bulrush. Root-stock (dyed): black pattern, Pomo<sup>27</sup> Panamint.<sup>28</sup> Root bark, black pattern, Pomo).<sup>29</sup>

*Scirpus robustus*. Bulrush. Stem: warp and woof, Pomo; foundation, Yokuts.

*Scirpus* sp. Tule. Root (dyed): black pattern, Pomo.<sup>30</sup> Stem: warp and woof, Lutuami.<sup>31</sup> Wrapping, Cahuilla.<sup>32</sup>

*Scirpus* sp.<sup>33</sup> Marsh Bulrush. Root: black pattern, Panamint.

## Ericaceae

*Arctostaphylos* sp. Manzanita. Green wood (charcoal): black dye.

## Fagaceae

*Quercus lobata*. White oak. Bark (+FeO<sub>2</sub>): black dye, Concow Maidu.

## Gramineae

(*Cinna macroura*. Grass. Stalk: foundation, Cahuilla,<sup>34</sup> Southern California.)<sup>35</sup>

*Epicampes rigens californica*. Grass. Stalk: foundation, Miwok, Yokuts, Washo, Mono, Kitanemuk, Panamint, Chemehuevi, Kawaiisu, Tübatulabal, Kern County, Luisiño, Cahuilla, Cupeño, Diegueño, Chumash.

*Phragmites vulgaris*. Reed. Stem: warp and woof, Lutuami; white pattern, Lutuami and Achomawi.

*Sporobolus* sp. Grass. Stalks: foundation, California,<sup>36</sup> Yokuts.<sup>37</sup>

(*Vilfa* sp. Grass. Stalks: foundation, California,<sup>38</sup> Ventura (?).<sup>39</sup> Root: pattern, San Francisco.)

<sup>24</sup> Of storage baskets. They are constructed much like a nest and are not really textiles.

<sup>25</sup> At beginning only.

<sup>26</sup> Merriam, C. H., 1903, p. 825. Probably = *Carex* sp.

<sup>27</sup> Barrett, S. A., 1908, p. 137 = *S. robustus*.

<sup>28</sup> Coville, F. W., 1902, p. 38 = *S. robustus*.

<sup>29</sup> Purdy, Carl, 1902, p. 15 = *S. robustus*.

<sup>30</sup> James, G. W., 1904, p. 82, and Kroeber, A. L., 1909. Probably = *S. robustus*.

<sup>31</sup> Kroeber, A. L., 1905, p. 148, and Barrett, S. A., 1910, p. 254 = *S. lacustris occidentalis*.

<sup>32</sup> James, G. W., 1904, p. 84.

<sup>33</sup> Merriam, C. H., 1903, p. 826. Probably = *S. robustus*.

<sup>34</sup> Barrows, D. P., 1900, p. 42 = *Epicampes rigens californica*.

<sup>35</sup> James, G. W., 1904, p. 84 = *Epicampes rigens californica*.

<sup>36</sup> James, G. W., 1904, p. 75. Probably = *Epicampes rigens californica*.

<sup>37</sup> *Ibid.*, p. 84, and Powers, Stephen, 1877, p. 429. Probably = *Epicampes rigens californica*.

<sup>38</sup> James, G. W., 1904, p. 75 = *Epicampes rigens californica*.

<sup>39</sup> Priestley, H. I., mss., p. 42.

## Iridaceae

*Iris* sp. Iris. Leaf: foundation,<sup>40</sup> Miwok.

## Juncaceae

*Juncus acutus*. Rush. Leaf: wrapping, warp, and woof, Chumash, Diegueño, Luiseño, Cahuilla; leaf (dyed): pattern, yellow and black, Chumash, Diegueño, Luiseño, Cahuilla; foundation, Luiseño, Cahuilla.

*Juncus balticus*. Rush. Leaf: foundation, Washo (children).<sup>41</sup>

*Juncus effusus*. Rush. Leaf: warp, woof (practice baskets), Round Valley.<sup>41</sup>

*Juncus lesenerii*.<sup>42</sup> Reed grass. Leaf: woof, Cahuilla.

*Juncus mertensianus*. Rush. Leaf: foundation, wrapping, warp, woof, Luiseño.<sup>43</sup>

(*Juncus robustus*. Tule grass. Leaf (dyed): brown or black pattern, Southern California.)<sup>44</sup>

*Juncus textilis*. Basket rush. Stem: wrapping, Cahuilla.

*Juncus* sp. Rush. Leaf: wrapping, Diegueño,<sup>45</sup> Cahuilla.<sup>45</sup> Leaf (dyed): brown pattern, Luiseño;<sup>46</sup> black and orange pattern, Cahuilla.<sup>47</sup>

## Leguminosae

(*Dalea Emoryi*. Stem: yellow dye, Cahuilla,<sup>48</sup> Southern California.)<sup>49</sup>

*Cercis occidentalis*. Redbud. Bark: rim binding, Wailaki, Yuki, Yana, Maidu; red pattern, Lassik, Kato, Yuki, Wappo, Achomawi, Atsugewi, Yana, Pomo, Washo, Wintun, Maidu, Concow Maidu, Miwok, Yokuts, Mono, Kawaiisu, Kern County. Bark (dyed): black pattern, Yuki, Wappo, Pomo, Maidu. Sapwood: wrapping, Kato, Yuki, Pomo, Yana, Washo, Wintun, Maidu, Miwok, Yokuts, Mono, Chemehuevi, Kern County, Tübatulabal, Concow Maidu; woof, Washo, Maidu, Concow Maidu, Miwok, Yokuts, Mono, Kern County; foundation (overlay), Yuki. Stem: foundation, Pomo, Washo, Wintun, Maidu, Concow Maidu, Yokuts, Mono; warp, Washo, Miwok, Yokuts, Mono, Kern County; rim hoop, Kawaiisu.

*Parosela emoryi*. Parosela. Yellow dye, Chumash, Diegueño, Luiseño, Cahuilla, Cupeño.

*Prosopis juliflora*. Mesquite. Bark: woof (rope), Mohave.

*Psoralea macrostachya*. Leather root. Root: yellow dye, Luiseño.

## Liliaceae

*Chlorogalum pomeridianum*. Soap root. Juice: seed proofing, Miwok.

*Xerophyllum tenax*. Squaw grass. Leaf: white pattern, Tolowa, Hupa, Whilkut, Nongatl, Lassik, Wailaki, Sinkyone, Yurok, Wiyot, Chimariko, Shasta, Yuki, Yana, Karok, Wintun, Yokuts, Achomawi, Atsugewi. Leaf (dyed): yellow pattern, Hupa, Yurok, Karok, Yokuts.

(*Yucca arborescens*. Tree Yucca. Root: red pattern, Panamint,<sup>50-51</sup> Kern County.)<sup>50</sup>

<sup>40</sup> At beginning only.

<sup>41</sup> Coville, F. W., 1905, p. 30.

<sup>42</sup> Barrows, D. P., 1900, p. 45. Probably = *Juncus acutus*.

<sup>43</sup> Sparkman, P. S., 1908, p. 204. Probably = *Juncus acutus*.

<sup>44</sup> James, G. W., 1904, p. 84 = *Juncus acutus*.

<sup>45</sup> Kroeber, A. L., 1909.

<sup>46</sup> Sparkman, P. S., 1908, p. 234.

<sup>47</sup> Merriam, C. H., 1903, p. 826.

<sup>48</sup> Palmer, Edward, 1878, p. 651 = *Parosela emoryi*.

<sup>49</sup> James, G. W., 1904, p. 84 = *Parosela emoryi*.

<sup>50</sup> Coville, F. W., 1905, p. 42 = *Y. brevifolia*.

<sup>51</sup> Merriam, C. H., 1903, p. 826 = *Y. brevifolia*.

*Yucca brevifolia*. Tree Yucca. Root bark; red pattern, Mono, Kitanemuk, Panamint, Tübatulabal, Kern County; brown pattern, Kawaiisu.

*Yucca Mohavensis*. Spanish Bayonet. Leaf: foundation?, Southern California.<sup>52</sup>

#### Nymphaeaceae

*Nymphaea polysepala*. Water lily. Seed shell (+FeO<sub>3</sub>): black dye, Lutuami.

#### Palmaceae

(*Neowashingtonia filamentosa*. Desert Palm. Leaf: wrapping, Cahuilla.)<sup>53</sup>

*Washingtonia filifera*. Desert Palm. Leaf: wrapping, Luiseño, Cahuilla.

#### Parmeliaceae

*Evernia vulpina*. Wolf Moss. Whole: yellow dye, Hupa, Yurok, Lutuami, Karok, Wintun, Northern Paiute.

#### Pedaliaceae

(*Martynia louisiana*. Devil's Horns. Seed pod: black pattern, Southeastern California.)<sup>54</sup>

*Martynia proboscidea*. Unicorn plant. Seed pod: black pattern, Mono, Kitanemuk, Panamint, Chemehuevi, Kawaiisu, Tübatulabal, Kern County.

*Martynia* sp. Devil's Horn. Seed pod: black pattern, Panamint.<sup>55</sup>

#### Pinaceae

*Juniperus occidentalis*. Juniper. Root: warp and woof, Lutuami. Part not specified: Pomo,<sup>56</sup> Bark: cradle mattress, Mohave.

*Picea sitchensis*. Lowland Spruce. Root: woof, Tolowa, Whilkut, Nongatl, Lassik, Wailaki, Hupa; rim binding, Tolowa.

*Pinus lambertiana*. Sugar Pine. Root: woof, Hupa, Lassik, Yurok, Wiyot, Karok, Chimariko.

*Pinus monophylla*. One-leaf Pine. Pitch: waterproofing, Kawaiisu, Panamint.

*Pinus ponderosa*. Yellow Pine. Root: woof, Hupa, Achomawi, Atsugewi, Wintun, Maidu, Miwok; foundation and wrapping, Miwok.

*Pinus sabiniana*. Digger Pine. Root: woof, Wailaki, Yuki, Mendocino County, Wappo, Pomo, Hupa; warp, Pomo; wrapping, Yuki, Pomo.

*Pinus* spp.<sup>57</sup> Pines. Root: woof, Northern California, Yurok, Wiyot, Yana, Pomo, Yokuts.

*Pseudotsuga mucronata*. Red Fir. Root: woof, Pomo.

*Pseudotsuga taxifolia*. Douglas Spruce. Root: woof, Whilkut, Nongatl, Pomo, Mendocino County.

#### Polypodiaceae

*Adiantum pedatum*. Maidenhair, Five-Finger. Stem: black pattern, Tolowa, Hupa, Whilkut, Nongatl, Lassik, Wailaki, Yurok, Achomawi, Karok, Pomo (Coast),<sup>58</sup> Wintun, Mendocino County.

*Adiantum* sp.<sup>59</sup> Maidenhair. Stem: black pattern, Northern California, Yurok, Sinkyone, Achomawi, Shasta, Pomo.

<sup>52</sup> Parsons, M. E., 1907.

<sup>53</sup> Coville, F. W., 1905, p. 52 = *Washingtonia filifera*.

<sup>54</sup> Coville, F. W., 1905, p. 31 = *M. proboscidea*.

<sup>55</sup> Merriam, C. H., 1903, p. 826 = *M. proboscidea*.

<sup>56</sup> Barrett, S. A., 1910, p. 257.

<sup>57</sup> Undetermined conifer roots are found as woof in these tribes: Tolowa, Hupa, Whilkut, Nongatl, Lassik, Wailaki, Yurok, Karok.

<sup>58</sup> Chesnut, V. K., 1902, p. 303, gives this species as a black pattern material among the Pomo in the vicinity of the coast. Purdy, Carl, 1902, p. 15, says maidenhair is never used by the Pomo.

<sup>59</sup> = *A. pedatum*.

*Ceropteris triangularis*. Goldenback Fern. Stem: black pattern, Hupa.

(*Gymnogramma triangularis*.<sup>60</sup> Goldenback Fern. Stem: black pattern, Pomo.)

*Pteris aquilina*. Brake Fern. Root: brown pattern, Pomo, Washo, Miwok, Mono, Kawaiisu, Tübatulabal. Root (boiled): black pattern, Pomo, Washo, Miwok, Yokuts, Maidu, Mono, Kitanemuk, Kawaiisu, Tübatulabal, Kern County.

(*Pteridium aquilinum*,<sup>61</sup> Brake Fern. Root: black pattern, Pomo, Mendocino County, Yokuts.)<sup>62</sup>

(*Woodwardia radicans*.<sup>63</sup> Giant Fern. Stem (dyed): red pattern, Hupa.)

*Woodwardia spinulosa*. Giant Chain Fern. Stem: white pattern, Hupa. Stem (dyed): red pattern, Tolowa, Hupa, Whilkut, Nongatl, Yurok, Achomawi, Wintun.

(*Woodwardia* sp.<sup>63</sup> Woodwardia. Stem (dyed): red pattern, Northern California, Yurok, Sinkyone; yellow pattern, Yurok.)

#### Rhamnaceae

*Ceanothus integerrimus*. Deer Brush. Stem: Concow Maidu.<sup>64</sup> Stem: foundation, Mendocino County; warp, Miwok.

#### Rosaceae

*Rubus vitifolius*. Blackberry. Juice (berry): black dye, Luiseño.

#### Salicaceae

*Populus trichocarpa*. Black Cottonwood. Root: woof, Hupa.

*Salix argophylla*. Willow. Stem: warp, Pomo.

(*Salix fluviatilis argyrophylla*.<sup>65</sup> Willow. Stem: warp, Hupa.)

*Salix hindstana*. Willow. Stem: warp, Pomo. Sapwood<sup>66</sup> and bark,<sup>66</sup> Pomo.

*Salix lasiandra*. Yellow Willow. Stem: warp, Panamint.

*Salix nigra*. Black Willow. Stem: woof, Panamint. Inner bark:<sup>66</sup> Pomo.

*Salix sitchensis*. Velvet Willow. Stem: warp and woof, Pomo.

*Salix* spp.<sup>67</sup> Willows. Stem: warp, Hupa, Whilkut, Nongatl, Wailaki, Kato, Yurok, Wiyot, Yuki, Wappo, Pomo, Lutuami, Achomawi, Yana, Wintun, Washo, Maidu, Concow Maidu, Miwok, Yokuts, Mono, Northern Paiute, Panamint, Chemehuevi, Kawaiisu, Kern County, Ventura Chumash, Cahuilla, Mohave; woof, Wailaki, Kato, Yuki, Wappo, Pomo, Lutuami, Achomawi, Yana, Washo, Maidu, Miwok, Yokuts, Mono, Northern Paiute, Chemehuevi, Kawaiisu, Kern County, Ventura Chumash, Cahuilla, Mohave; rim hoop, Whilkut, Nongatl, Lassik, Wailaki, Wiyot, Yana, Pomo, Northern Paiute; foundation, Kato, Wappo, Pomo, Washo, Wintun, Maidu, Concow Maidu, Miwok, Yokuts, Mono, Panamint, Kawaiisu, Chemehuevi, Mohave. Root: woof, Hupa,<sup>68</sup> Yurok, Wappo; wrapping, Pomo. Bark: woof, Miwok, Yokuts, Mohave; rim binding, Wailaki, Lutuami; red pattern, Pomo, Miwok, Panamint; brown pattern, Washo, Miwok, Yokuts, Kitanemuk, Kern County. Bark (dyed): black pattern, Washo. Sapwood: rim binding, Yuki, Northern Paiute; wrapping, Washo, Maidu, Kitanemuk, Panamint, Chemehuevi, Kawaiisu; woof, Wintun, Panamint, Mohave. Sapwood (dyed): black pattern, Chemehuevi. Stem: Gualala Pomo.<sup>69</sup> Part not specified; Chimariko.<sup>70</sup>

<sup>60</sup> = *Ceropteris triangularis*.

<sup>61</sup> = *Pteris aquilina*.

<sup>62</sup> Merriam, C. H., 1903, p. 826: Tulare = Yokuts.

<sup>63</sup> = *W. spinulosa*.

<sup>64</sup> Coville, F. W., 1902, p. 23.

<sup>65</sup> = *S. argophylla*.

<sup>66</sup> Coville, F. W., 1902, p. 347.

<sup>67</sup> On account of the similarity between species and the apparent lack of discrimination by the Indians themselves, the genus has been made the basis of separation in this study, with the above exceptions.

<sup>68</sup> At start only.

<sup>69</sup> Powers, Stephen, 1877, p. 187.

<sup>70</sup> Coville, F. W., 1902, p. 36.

Saxifragaceae

*Philadelphus gordonianus*. Syringa. Stem: warp,<sup>71</sup> Mendocino County, Yuki, Wailaki.

Sapindaceae

*Acer macrophyllum*. Big leaf maple. Sapwood: Mendocino County,<sup>72</sup> Concow Maidu.<sup>73</sup> Stem: warp, Maidu. Sapwood, woof and wrapping, Miwok. Bark, rim binding, Miwok.

Smilacaceae

*Smilax californica*. Greenbriar. Stems: Mendocino County. Stem: black pattern, Yuki.

Taxaceae

*Torreya californica*. California Nutmeg.  
(*Tumion californicum*.<sup>74</sup> California Nutmeg. Root: woof, Pomo.)

Taxodiaceae

*Sequoia sempervirens*. Coast Redwood. Root: woof, Hupa, Yurok, Sinkyone, Karok.

Typhaceae

*Typha latifolia*. Cat-tail. Leaf: warp, woof, and white pattern, Lutuami.

Urticaceae

*Urtica breweri*. Nettle. Bark: woof,<sup>75</sup> Lutuami, Northern Paiute; rim binding, Lutuami.

Vitaceae

*Vitis californica*. Wild Grape. Stem: rim binding, Whilkut, Nongatl, Lassik Wailaki, Yurok, Wiyot, Yuki, Pomo, Maidu; woof, Yokuts. Root: woof, Hupa, Yuki; warp, Yurok.

*Plants Accessory to Basketry*

Cactaceae

*Echinocactus polycephalus*. Devil's pincushion. Spine: awl, Panamint.  
*Opuntia* sp. *Opuntia*. Spine: awl, Cahuilla.

Ericaceae

*Arctostaphylos* sp. Manzanita. Wood: awl handle, Cahuilla.

<sup>71</sup> In baby carriers.

<sup>72</sup> Coville, F. W., 1905.

<sup>73</sup> Chesnut, V. K., 1902, p. 365.

<sup>74</sup> = *Torreya californica*.

<sup>75</sup> At start only.

## BIBLIOGRAPHY

BARRETT, S. A.

1908. Pomo Indian Basketry. Univ. Calif. Publ. Amer. Arch. Ethn., vii, pp. 133-306.
1910. The Material Culture of the Klamath Lake and Modoc Indians of Northeastern California and Southern Oregon. *Ibid.*, v, pp. 239-292.

BARROWS, D. P.

1900. Ethno-botany of the Coahuilla Indians of Southern California. Univ. Chicago Press.

CHESNUT, V. K.

- 1900-1902. Plants used by the Indians of Mendocino County, California. Contrib. Nat. Herb. (Washington, D. C.), vii, pp. 295-422.

COVILLE, F. W.

1892. Panamint Indians of California. Am. Anthr., o.s., v, pp. 351-361.
1905. Plants Used in Indian Basketry. In Mason, O. T., Indian Basketry (London). [Reprinted from Report U. S. Nat. Museum for 1902 (Washington, D. C.), pp. 171-548, 1904.]

DIXON, R. B.

1900. Basketry Designs of the Maidu. Am. Anthr., n.s., ii, p. 266.

GODDARD, P. E.

1903. Life and Culture of the Hupa, present series, i, pp. 38-48.

HOLMES, W. H.

1902. Anthropological Studies in California. Report U. S. Nat. Museum for 1900, pp. 161-187.

JAMES, G. W.

1901. Basket Makers of California at Work. Sunset Magazine (San Francisco), viii, p. 10.
1904. Indian Basketry. (New York.)

JEPSON, W. L.

1901. Flora of Western Middle California. (Berkeley.)

KROEBER, A. L.

1905. Basket Designs of Northwestern California. Present series, ii, pp. 105-164.
1909. California Basketry and the Pomo. Am. Anthr., xi, pp. 233-249.

MASON, O. T.

1900. Hudson Collection of Basketry. Am. Anthr., n.s., ii, pp. 346-353.

MERRIAM, C. H.

1903. Some Little Known Basket Materials. Science (New York), n.s., xvii, p. 826.

PALMER, EDWARD

1878. Plants Used by the Indians of the United States. *Am. Naturalist* (Philadelphia), XII, pp. 593-606, 646-655.

PARSONS, MARY

1907. Wild Flowers of California. (San Francisco.)

POWERS, STEPHEN

1877. Tribes of California. *Contrib. to North Am. Ethn.* (Washington, D. C.), III.

PRIESTLEY, H. I.

- Translation from the Spanish of Pedro Fagés, *Noticias de Monterey*. (Manuscript, 1917.)

PURDY, CARL

1902. Pomo Indian Baskets. *Out West* (Los Angeles), XVI, pp. 9-19.

SPARKMAN, P. S.

1908. Culture of the Luiseño Indians. *Present series*, VIII, pp. 187-234.