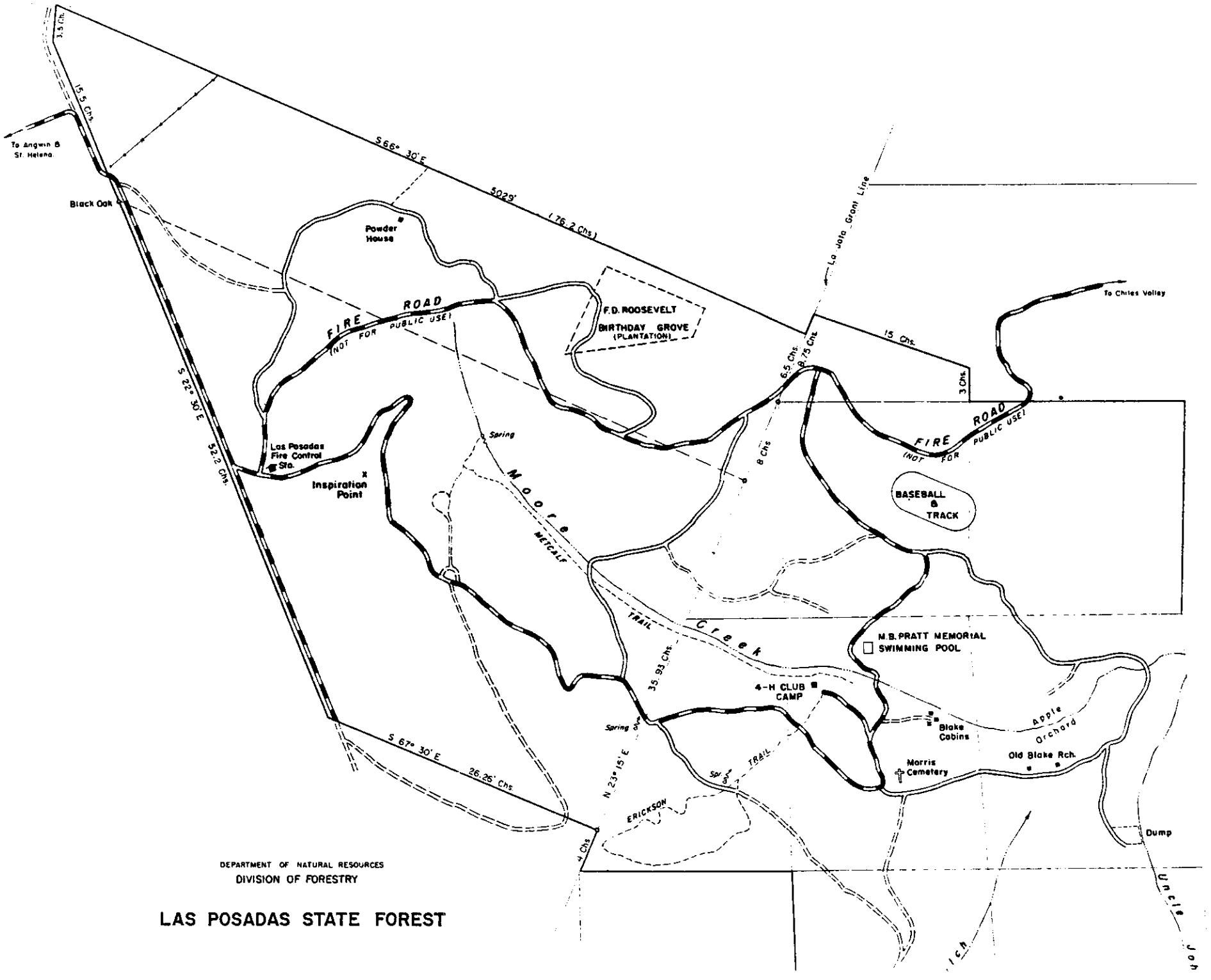
LAS POSADAS

Camp Conservation Guide

UNIVERSITY OF CALIFORNIA AGRICULTURAL EXTENSION


To Angwin & St. Helena
Black Oak
3.5 Chs.
15.5 Chs.
S 66° 30' E
5029'
(76.2 Chs.)
Powder House
FIRE ROAD
(NOT FOR PUBLIC USE)
F.D. ROOSEVELT
BIRTHDAY GROVE
(PLANTATION)
Lo Vota Grant Line
To Chiles Valley
15 Chs.
6.5 Chs.
8.75 Chs.
3 Chs.
FIRE ROAD
(NOT FOR PUBLIC USE)
S 22° 30' E
52.2 Chs.
Las Posadas Fire Control Sta.
Inspiration Point
Spring
8 Chs.
BASEBALL & TRACK
Moore
METCALF
TRAIL
Creek
M.B. PRATT MEMORIAL SWIMMING POOL
35.93 Chs.
4-H CLUB CAMP
Spring
Blake Cabins
Apple Orchard
Old Blake Rch.
Morris Cemetery
N 23° 15' E
TRAIL
S 67° 30' E
26.26 Chs.
ERICKSON
4 Chs.
Dump
Uncle
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF FORESTRY
LAS POSADAS STATE FOREST

GEOLOGY AND SOILS OF LAS POSADAS STATE FOREST

by

Walter W. Weir
Drainage Engineer
University of California

GEOLOGY AND SOILS OF LAS POSADAS STATE FOREST

Las Posadas State Forest is located in the hills about four miles north and three miles east of St. Helena in Napa County. The area is drained by the upper tributaries of Moore Creek. This creek is a perennial stream although during the summer months the flow is small.

In the vicinity of the 4-H Club camp Moore Creek forms a distinct boundary between different geological formations. West of the Creek the entire area within the Forest is composed of Sonoma volcanics.

The rocks out of which Howell Mt. is carved belong to a series of volcanic flows, tuffs and interbedded sediments covering an area of about 350 square miles in the general vicinity. This series of flows, breccias and tuffs is the result of volcanic activity during the Pliocene era, some 2 to 4 million years ago. Apparently fissures and vents were opened up in the rocks which underlie these volcanics and masses of lava flowed from them quietly, something like thick molasses. Occasionally however these volcanos exploded and threw chunks of lava and pieces of the underlying rock into the air. This material, upon falling to the earth formed the tuff and breccias which as it cooled created what is now called the Sonoma volcanics. The tuffs are fine grained volcanic ash and the breccias are coarse grained rocks containing fragments of various kinds which probably were not heated to a molten stage at the time of their expulsion. The Sonoma formation contains a mixture of both the tuffs and breccias.

When this type of material is exposed to weathering in a climate such as that now found in the Posadas Forest area - that is, with a two season climate (distinctly wet and dry periods), a rainfall of 30 to 40 inches per year and moderate temperatures - the soils which are formed are known as the Butte Series. This is the soil which may be found along the road from the entrance to the Forest to the 4-H Club camp and makes up a large part of the soils found in the Forest. This is a light brownish-gray, friable stony loam, which is slightly acid in reaction (pH 5.5 to 6.0). It is a primary, or residual soil, having been formed in place through the weathering of the underlying rocks. The soil contains many angular, rock fragments which, together with the steep slopes on which it is found, make it of little agricultural value. Butte soils support a fair to heavy stand of timber consisting of fir, yellow pine, Digger pine, and oaks, as well as brush of the chaparral types. A rainfall of 40 inches a year is just about the lower limit of that necessary to produce commercial timber. A typical profile of Butte stony loam in Las Posadas Forest is as follows:

I. Soil Profile (Butte stony loam):
0 - 7" Light gray, friable, granular to gritty stony loam. (In virgin areas, such as those in the Las Posadas Forest, the surface is generally covered with a 1- or 2-inch layer of leaf mold, and forest litter, which darkens the immediate surface.) Slight acid reaction (pH 5.5 - 6.0).
7 - 20" Light brownish-gray stony loam that contains considerable partially disintegrated rock fragments. Slightly more acid at the surface; friable.
20"+ Light colored, rhyolitic tuff and breccia, often fractured to several feet.

II. Range in characteristics: Soils may vary in depth to bedrock over short distances. Steeper areas often have rock outcrop.

III. Topography: Rolling to steep.

IV. Drainage: Surface runoff generally rapid; erosion severe on cleared areas; internal drainage moderate.

V. Vegetation: Varies from timber, in wetter and cooler areas, to chaparral in the dryer and warmer area.

In the vicinity of the camp site, on the east side of Moore Creek, there is a narrow band of sedimentary rock. This is a yellowish fine grained sandstone. This sedimentary or secondary rock is composed of material that was at one time soil but has since been subjected to pressure and probably some heating and was compressed into a hard rock. It is now exposed and again weathering into a soil. Under the climatic conditions found in the Las Posadas area, there would be formed a soil similar to that of the Hugo Series. The area of sedimentary rock in the Las Posadas is small and identification is somewhat uncertain.

Hugo soils are grayish-brown, or dull grayish-brown, with a slight yellowish cast. They are derived from the weathering in place of secondary rocks, such as sandstone or shale. These soils are slightly to moderately acid in reaction, and are found in regions of moderate to high rainfall (30 to 60 inches). A typical profile description of Hugo soil is as follows:

I. Soil profile (Hugo clay loam):
0 - 8" Grayish-brown clay loam, which is granular or softly cloddy. The reaction is slightly acid. The immediate surface is usually somewhat darker due to a thin layer of litter or humus. This surface horizon grades gradually at
8 - 26" into a lighter-colored somewhat more yellow clay loam containing a few rock fragments. This layer is usually more compact and cloddy than the surface.
26 - 40" the soil becomes still lighter-colored, and grades gradually into disintegrated sandstone bedrock.

II. Range in characteristics: In this area, the steep slopes tend to erode and keep the soil from developing a deep profile.

III. Topography: Rolling to steep.

IV. Drainage: Surface runoff is rapid; internal drainage moderate to good.

V. Vegetation: In this area, virgin soils of the Hugo series produce a fair stand of timber, including yellow pine, oaks, chaparral and grass.

On the relatively flat area, on which the running track and baseball diamond are located, the soils are heavy-textured, dark-colored, shallow, and stony. These soils are derived from the weathering in place of serpentine, or serpentinized, rocks and belong in the Montara Series.

Serpentine or serpentinized rocks, as found in the Coast Range hills and mountains of California, occupy the contact zone between sedimentary rocks and basalts. They are greenish in color, and have a slick soapy feel. They are sometimes called greenstone. These rocks have been altered by the pressure and heat which changed the sediments into sandstone.

Montara soils, which are normally found in areas of 15 to 35 inches of rainfall, are slightly acid to neutral in reaction. A typical profile description of Montarasoil is as follows:

I. Soil Profile (Montara stony clay loam):
0 - 6" Dark Grayish-brown, sticky clay loam with many rock fragments, and exposed serpentine bedrock.
6 - 15" Dark Grayish-brown clay, or heavy clay loam, with many rock fragments.
15"+ Greenish, slick, unweathered or slightly weathered serpentine rock.

II. Range in characteristics: There may be considerable range in the amount of broken rock in the profile, and in many areas the soil is not as deep as described above.

III. Topography: In this forest, Montara soils are found on relatively flat but irregular areas.

IV. Drainage: In this area, surface runoff is sluggish; subsoil drainage poor. Seepage areas are found in places.

V. Vegetation: Short grass; very seldom trees or dense brush. Montara soils are usually infertile, and poorly adapted to any kind of crops.

South of the Montara soils area and southeast of the swimming pool is a rounded, grass covered, hill composed of light reddish-brown or yellowish-red soils of the Auburn Series. Underlying this soil is a basic igneous rock from which the soil is derived by weathering. This rock is part of the lava flow which was pushed up through the vents or cracks in the base material during the time that this general area was experiencing volcanic activity. These lava flows were however not thrown into the air as was the material previously referred to as forming the tuffs and breccias. The fine grained texture of these basalts is due to the rapidity with which the material cooled. The igneous rocks which cooled most rapidly formed volcanic glass or obsidian which may possibly be found in the forest area. This is the material from which the Indians who lived in this vicinity made their arrow heads.

Auburn soils are derived from the weathering in place of basic igneous rocks such as amphibolite, schists, and diabase. They are usually shallow, and frequently contain a considerable amount of rock fragments. Rock outcrop may also be frequent. This soil is associated with, and closely resembles, the soils of the Aiken series which it differs in being less red in color, shallower, and less acid in reaction. Auburn soils are found in areas where the rainfall is normally 15 to 35 inches. This soil supports a cover of grass, grass-oak, or brush. A typical description of the Auburn soil is as follows:

I. Soil Profile (Auburn stony clay loam):
0 - 7" Light reddish-brown clay loam containing rock fragments, granular structure, friable when moist, hard when dry. Slightly acid in reaction.
7 - 14" Reddish-brown clay loam, slightly compact, little change in color; more rock fragments.
14 - 17" Brown, moderately compact, clay or heavy clay loam. Sticky and plastic when wet.
17"+ Fractured and partially decomposed basic igneous, and metamorphosed basic igneous rock.

II. Range in characteristics: Rather wide variation in depth to rock; rock outcrop occurs frequently, especially in very shallow types.

III. Drainage: Surface runoff rapid; subsoil drainage usually good.

IV. Vegetation: In this Forest, the native cover ranges from grass-oak to brush and small shrubs.

In portions of the Las Posadas Forest area the soils of the Konokti series are found. These soils are derived from basic igneous rocks, such as andesites, rhyolites, and andesitic tuff. These soils are reddish-brown, and appear in roadcuts as being more pronounced brown than those of the Auburn series, and distinctly different from those of the Butte series. In this area, the Konokti soils are shallow and there are many rock fragments near the surface. There is very little difference between this soil and the shallow types of Auburn.

I. Soil Profile (Konokti stony clay loam)
0 - 5" Reddish-brown clay loam containing many rock fragments; granular structures porous and friable.
5 - 10" Slightly redder in color, but otherwise similar to the surface. There is no noticeable change in texture.
10"+ Many rock fragments, and disintegrating bedrock; porous.

II. Range in characteristics: These soils range in depth from 10 to 30 inches. The shallow types of Konokti, in this area, differ only slightly (mainly color) from the shallow types of Auburn.

III. Drainage: Good to excessive in both surface and subsoil.

IV. Vegetation: Most of the Konokti soils support a more dense growth of trees and less grass than the Auburn.

ROCKS OF THE HOWELL MT. AREA

by

Stephen Bruff
Professor of Geology
College of Marin
Marin County

ROCKS OF THE HOWELL MT. AREA

SONOMA VOLCANICS Pliocene

This group of rocks is named from the Sonoma Mountain. These volcanic rocks are composed of a complex series of lava flows and tuff beds that are in certain areas interbedded with sandstone and conglomerate.

The lava flows make up approximately 60% of the total. These flows are largely andesitic, but are very close to basalt in composition. The lava flows show great variation in form and structure over very short distances. Changing in thickness from a few feet to several hundred, and in texture from dense and fine-grained to vesicular and agglomeratic.

The Sonoma Volcanics occupy today five separate areas that total over 350 square miles in area, but it is probable that originally they formed one continuous series of surface flows poured out onto an older eroded surface that cut the underlying folded Franciscan Group rocks.

The most common variety of andesite is a porphyry which when fresh, is a dense, massive, dark-gray to black rock with conspicuous phenocrysts of light and dark colored minerals. Often these phenocryts as set in a fine, glassy groundmass which often shows flow structure.

A dense, light brownish to reddish-gray laminated basalt is common near the middle of sequence. Between many of the lava flows are beds of tuff consisting of fine to coarse-grained brownish fragments of volcanic ash and lava. Some of the lavas show vesicular layers between the dense portions.

The St. Helena Rhyolite member of the Sonoma Volcanics occurs near the top of the sequence. These rhyolites are of three kinds:

1. The most common is a bluish-gray, coarse-textured, porphyry showing well defined banding and flow structure.
2. A creamy-white, dense, vitreous rock in which the crystals are invisible to the unaided eye.
3. Pitchstone and Obsidian in flows and as pumice.

All of these volcanic rocks are involved in the folding that produced the Napa valley. Near the camp they are nearly flat lying and are resting on the upturned edges of much older rocks (Franciscan Group). Since their folding and uplift they have been deeply eroded so that only patches remain. At the camp the erosion of Moore Creek has cut through to the older bedrock.

FRANCISCAN GROUP Jurassic ?

This group is widespread throughout the Coast Ranges and is the underlying bedrock in the Howell Mt. area. The group is largely sandstone with some shale, limestone, chert, together with metamorphic rocks, such as actinolite and glaucophane schists. Contemporaneous with the sandstones and shales are volcanic rocks (basalt). There are also intrusive sills of coarse-grained, dark colored igneous rocks such as gabbro, pyroxenite, and peridotite. These dark colored rocks are often altered to serpentine and are associated with the above mentioned metamorphic rocks.

The sandstones when fresh are dark gray with a greenish tint. They are hard, dense, medium to coarse-grained which on weathering become a yellowish brown.

Agglomerate (or breccia): rocks formed of cinders, bombs or blocks thrown out by volcanic explosions. Called breccia if the fragments are angular and agglomerate if somewhat rounded.

Andesite: a lava, fine grains, ranging in color from white to black in some cases dark gray to greenish gray. Is similar to Rhyolite except it contains no quartz and the feldspar is plagioclase. Flow structures are common. Named after the Andes Mts.

Basalt: a lava, fine grained, medium-gray to black and dark brown. The world's most abundant lava.

Conglomerate: Cemented gravel. Rounded stream pebbles cemented together.

Dike: a rock, usually igneous, that intrudes and cuts across other rocks. The word means "wall" and since the molten rock follows cracks in the earth's crust the gradual removal of the surrounding rocks by erosion often leaves the dike standing as a "wall".

Extrusive: Igneous or molten rocks that have been cooled at the surface of the earth.

Gabbro: a dark colored, coarse-grained rock; intrusive rock, a dark form of granit

Granite: a light-colored, coarse-grained intrusive igneous rock. "salt & pepper"

Groundmass: The body of an igneous rock into which larger crystals are imbedded.

Igneous: rocks congealed from molten material

Intrusive: Igneous rocks that have cooled below the earth's surface.

Lava: Molten rock that has cooled at the surface. Usually in flows. Often with vesicles.

Metamorphic: A class of rocks that have undergone great change due to heat or pressure or both.

Peridotite: Granular igneous rock composed almost entirely of dark colored ferromagnesium minerals and without feldspar or quartz. If the mineral olivine is a major constituent it would be called Peridotite, if pyroxine is the major mineral it would be called Pyroxenite.

Phenocryst: The large mineral crystals imbedded in the groundmass of a Porphyry.

Porphyry: A rock with a groundmass that is finer than the phenocrysts imbedded in the groundmass.

Pitchstone - Obsidian: Volcanic glass; rapidly cooled lavas with a glassy luster and without visible grains. When the luster is less glassy and tends to be dull it is called Pitchstone.

Pumice: Obsidian froth. Light-gray to white in color and abundant tiny bubbles are characteristic. The bubbles are so numerous that pumice will float on water. Pumice is common as the fragments in Tuffs and Breccias. It also may form distinct flows, or more commonly, it caps flows of obsidian or rhyolite, and grades downward into unfrothed lava beneath.

Rhyolite: Fine-grained, light-colored lava, generally peppered with phenocrysts of quartz and feldspar (orthoclase). Generally white or light shades of yellow, brown, or red. Often flow banded.

Scoria: The dark lava (basalt) froth. Similar to pumice except for color.

Serpentine: Peridotites that contain the mineral olivine are easily altered to a mixture of greenish colored hydrous minerals (contain water). Since serpentine is composed of minerals that are secondary (altered) to the original igneous it is often classed as a metamorphic rock. Serpentine forms sills, dikes and lenses. Usually dark green to light green with greasy feel.

Sill: an igneous intrusion which slides between layers of other rocks and hardens.

Tuff: (Volcanic Tuff) is a fine-grained deposit composed of fragments of obsidian (often in the form of pumice) broken chunks of lava, ash and anything thrown out by a volcanic eruption.

Vesicular: air and gas bubbles in lava. Usually found near the top of lava flows. Coarse bubbles compared to pumice. Will not float on water.

Volcanic Ash: Dust from a volcanic eruption that settles and forms fine-grained deposits. Similar to Tuff but has not chunks of rock or pumice, all fine material.

INDIANS OF THE HOWELL MT. AREA

(This material abstracted from a study made by Harold E. Driver at the Indian Reservation near Geyserville in 1932.)

INDIANS OF THE HOWELL MT. AREA

This material is abstracted from a study made by Harold E. Driver at the Indian Reservation near Geyserville in 1932, where he got as much information as possible from three mature Wappo Indians who knew something of early day life, habits and customs of their people. These were John Tripo, Mary Eli and her son George Fish. Both Tripo and Eli lived in grass houses in the aboriginal community of Unutsawaholma noma (Toyon-berry-grove Town) on the Russian River north of Healdsburg.

The Wappo tribe apparently occupied a small territory directly north of San Francisco Bay about 50 miles long and 20 miles wide with a center about half way between the mouth of the Napa River and Clear Lake. They were closely allied in customs and habits to the Pomo tribes which occupied lands west to the coast and in the vicinity of Clear Lake. The land is mostly hilly or mountainous, but there are several fertile valleys in which most of the Indians lived.*

Cultural Status. The aboriginal culture of the Wappo Indians was one of the simplest in North America or, for that matter, in the world. They were without writing, metals, agriculture, pottery, or domestic animals, even dogs. To us, their life was one of colorless simplicity. The chief food was the acorn, eaten as a rule in the form of mush. Small game undoubtedly furnished more of the diet than large game, although deer meat was an important food. These people did not hesitate to eat rats, mice, grasshoppers, snails, and such undelectables.

Houses were mostly of grass thatch and could be constructed in a day or two. Dress was at the minimum, from stark nudity for the man to a short double apron for the woman. Only in cold weather did the Wappo attempt to cover most of his body with a skin or a woven tule cape. Basketry was the only art of any note, and in this the Wappo excelled. Their baskets, in variety of shape, size, weave, and decoration and in quality of workmanship, are comparable to those of the neighboring Pomo, who are sometimes said to have made the finest basketry in the world.

In social organization, the Wappo were without clans, real chiefs, or definite tribal unity. The small social unit was the bilateral group of kin, and the larger one was the whole town or village community, numbering at most two or three hundred but usually about one hundred persons. As a rule, these small communities were more friendly among themselves than they were with the Pomo, but there was no centralized authority binding them together, and whatever unity they possessed was felt rather than actually achieved.

Another indication of the low cultural status of the Wappo was the lack of any far-reaching division of labor. All men except "physicians" did some hunting and fishing, and all women gathered vegetable foods. Arrowhead makers and clamshell-bead makers were the only tradesmen giving most of their time to their special tasks. Even the so-called chiefs hunted and fished with the rest of the men.

Without writing, systematized knowledge was scant. The only records were bundles of sticks, which were mere mnemonic devices to mark the moons and the dates of events a few days in the future. They also used sticks to count their clamshell-bead money, each stick standing for ten beads. Compared with other equally primitive groups, they perhaps excelled in counting, but their method was definitely inferior to that of the neighboring Pomo.

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*The name Wappo is an Americanization of Spanish quapo meaning brave.

Towns and Camps. They had permanent or winter towns and temporary summer camping places near the Russian River and other streams. They moved back to the waterproof grass houses when winter rains set in. Both winter and summer towns were named for local characteristics as were other place names. Some of these which are of interest are:

Permanent Towns

Kotico mota - Black Oak Hill - 2 sweat houses
Nets-tul - Milkweed Valley - 40 houses, 1 sweat house
Pipo-holma - White Oak Grove - 40 houses, 1 sweat house
Tsi'mitu-tso-noma - Humming bird place town - "Small town"
Oso'yuk-eju - Going-to-make-buckeye-mush creek - "Small town"
Melka wa-hotsa-noma - Salmon-Sweat-House Town - at present site of Middletown in Lake County.

Summer Camp Sites

Holko-mota - Pounding Basket Hill - 1 sweat house
Hut-mitul - Coyote Valley
Nuya-hotsa - Sand Sweat House
Tcano-naynuk - Manzanita Bush
Tsauso-tul - Willow Valley

Other Names

Hela wa-tul - Crazy Dance Valley
Kopa-me-nan - Bullfrog Water Well
Lelhumotuk - Rock Pile
Metsa-mota - Arrow Mountain - now Fitch Mt.
Mitico-opaus - Hazel Tree One
Tcuya-mota - House Mountain
Tiko-nusuk - Tree-lying-down
Tso-eju - Redwood Creek
Pipi - Quail
Tsibidokdok - Robin
Otukulu - Owl

Food. Like other central California peoples, the Wappo depended more on vegetable than on animal food. The acorn, perhaps the most important single food source, was supplemented by various grass seeds, roots, and nuts. The deer was the chief game animal although small game such as rabbits, squirrels, rats, birds, and grasshoppers probably provided more food the year round than did the deer. Fish were regularly caught, but were apparently a less important food than land animals or plants, and certainly constituted a smaller part of the diet than they did among the Pomo around Clear Lake. Sea food was eaten only occasionally when trips were made to the coast.

Small animals and fish were caught by hand or killed with sticks; sometimes dams and wicker fish traps were used and on land, brush fences, hand nets and the bow and arrow were used.

The following birds and animals were considered dangerous or sacred and were never eaten and rarely killed. Feathers used if found on ground.

Buzzard	Coyote
Eagle	Skunk
Roadrunner	Frogs
Crow	Toad
Raven	Lizard
Hawks	Snakes

Food Preparation. Meat was always roasted, never boiled; held over fire on stick, laid on coals or cooked in earth oven. Deer meat cut in strips, dried either in or outside house as were fish and mussels; then stored in baskets inside house. Small animals eaten almost entirely, rabbits pounded, bones, loose entrals, ears and all and roasted. Deer sometimes similarly prepared. Grasshoppers, caterpillars, squirrels, rats, mice, and gophers picked up from field burned to obtain such small game. Snails picked from ground or water and roasted.

Plant Food

Acorn, mel, many kinds: tan oak, tcetcic, best; black oak, kotic, most plentiful; white oak, pip; post oak, mel; iron oak, picmela; live oak, hicic; unidentified oaks, tsokic, holmel. Method of gathering and preparing acorns like that of Maidu, except for following differences or additions: Both men and women carried acorns to village in burden baskets. Kernels were dried in sun but also indoors on twined willow rack suspended from roof ca. 7 ft. above floor. Motar basket, holko, pestle, tc'ola, and stone base, lelpa'ya, same as those of Pomo, always used for grinding; woman sat with legs on top of hopper to hold it steady. Meal sifted through open-bowl basket with openwork bottom designed for purpose, or through twined seedbeater, wanma; not tapped in winnowing basket. Leached in cold water. Boiled in large coiled baskets. Boiling stone cleaned with moss, not rinsed in extra basket of water, Patwin fashion. Mush or soup drunk from small basket or eaten with unworked mussel or clamshell not with fingers. Some persons perforated such shells, always wore them around their necks. Acorn bread like that of Patwin and Maidu, except "Indian baking powder," tso tsipe (dirt red), mixed with batter. Granary height of man, 4 or 5 ft. wide; built on stone base ca. 2 ft. high to keep out water; willow or hazel stick vertical warp, with smaller shoots twined in to sustain it, roof grass-thatched. Acorns with hulls on stored in granary; kernels and flour kept indoors in baskets. No underground storage.

You will find at least two locations close to Las Posadas 4-H camp with pot holes in the rocks where the Indians ground acorns in this way.

Pinole, wa'ate. Made from seeds gathered with seedbeater and basket; seeds roasted, pounded, sifted, eaten dry with fingers.

Body and Dress

Men went nude most of the time and women wore the usual double aprons, made ordinarily of buckskin. In winter both sexes sometimes wore capes of hide, feathers, or tule. Tattooing was rare. The ears were pierced but not the nose. Body decorations consisted of woodpecker-scalp belts, shell beads, and paint. There was no head covering of any kind and the feet were usually bare. The almost complete absence of tattooing among the Wappo sets them off from their neighbors.

Woodpecker-scalp belts worn by chiefs and wealthy at public festivals. These belts of woven vegetable fiber, not of skin with scalps glued on; reached around waist once only; from 3 to 4 in. to 8 in. wide; red favorite color, very expensive.

Both sexes painted bodies for dances, men for war. Three colors: red earth, tsipe (red); black charcoal, ts'el; white earth, walalis.

Both sexes wore clamshell beads, abalone shells, and a few magnesite cylinders around necks and wrists. Abalone shells sometimes substituted for yellowhammer headband on forehead.

Houses

Wappo houses were typical of the area. The dwelling house was of grass thatch on a framework of poles stuck in the ground and bent over to form a dome. The ground plan was usually elliptical. The earth-covered semisubterranean house was used both as a men's sweat house and for the ceremonial activities of both sexes. In the summer camping season, people lived in simple brush structures and danced in a roofless circular brush enclosure.

The grass house was oval, never L shaped or rectangular and sometimes as much as 40 ft. long. Each family had separate space with door, fire and smoke hole. Beds were on ground with bunches of grass or roots for pillow.

The Hotsa was a combination sweat-club and dance house. Was dug into ground about 2 ft. with center pole and 5 side posts. Roof was brush and grass under dirt. Door faced south and one emergency exit north. Pit round and about 35 ft. in diameter. It had a flat cottonwood plank for foot-drum. The men sweated in the sweat house once or twice a day - then plunged in creek. Women bathed in creek and rubbed with angelica root. Used no towel - the wind dried them. Never sweated in the sweat house even for illness but applied hot rocks to pain.

Weapons

The chief weapon was the bow and arrow, used with the primary arrow release. Bows were not made locally but obtained in trade from the north. The Wappo also used the spear, the sling, and a rude club. A detachable harpoon was used only for large fish. All weapons except the harpoon served both for hunting and for warfare.

The manzanita bow was best and most expensive, buckeye bow apparently next best. Both 4 ft. long backed with sinews and said to shoot arrows 200 yds. Bowstring of sinew. Arrows shaft of hazel or alder with flint points made by a few professionals from flint from the St. Helena area chipped with an antler flaker. Points were not poisoned but rubbed with angelica for luck.

A sling made of diamond shaped buckskin 4 x 2 inches and cords about 3 ft. long. A hole or pocket in center to hold stone. Loop in one cord around middle finger, knot in other cord held between thumb and index finger. This had a range longer than the bow and was used for war and hunting. A good slinger could hit a fence post at 75 yds. using stone missile, not clay balls.

Textiles

Basketry was one of the arts of life in which the Wappo excelled. Their work was in every way comparable to that of the neighboring Pomo, who have been judged to be among the finest basketmakers in the world. This illustrates the principle that tribes generally low in culture may excel in some special feature. Besides baskets, rabbitskin blankets and capes of tule and feathers were woven. The loom used was nothing more than two poles in the ground between which the warp was stretched.

Musical Instruments

Musical instruments were as simple as those in the rest of California, and consisted of the plank drum, cocoon rattle, split-stick clapper, bone whistle, and a kind of flute. They were used chiefly to play accompaniments for dancing, but the flute at least was played for amusement.

Tools, Utensils

The technology of the Wappo was of the simplest. Tools and household utensils were undecorated, with the exception of baskets. Frequently natural shells, stones, and sticks were utilized. In this respect, central Californian tribes contrast with those of the lower Klamath river, who carved and decorated such things as horn spoons and wooden mush-stirrers, and even ground out symmetrically-shaped mauls and pestles of stone.

Games and Athletic Contests

The Wappo games were almost the same as those of the Pomo. They included the grass or hand guessing game, shinny, split-stick dice, deer-knuckle dice, a guessing game played with about fifty sticks, hoop and pole, and several other minor diversions. Most of the games, or similar ones, were played over much of North America as well as in California, and had analogues in many other parts of the world.

Long distance shooting with bow and arrow
Foot racing by either men or women
Swimming
Diving for length of time under water
Pulling against each other, feet touching with cross stick
Children had acorn tops to spin by hand
Girls played with dolls of sticks, clay or flat rocks.

Money

Wappo money, like that of the Pomo, was of the clamshell disk variety. This was to be expected since the source of the shells was Bodega Bay. There were no other strictly nonutilitarian forms of wealth, with the possible exception of woodpecker-scalp belts and other ceremonial regalia. Such utilitarian things as rabbit nets and deer-head diguises were among the most highly valued possessions. The Wappo traveled occasionally to the coast or to Clear Lake and received trade objects such as their bows from greater distances.

Property

As among other primitive peoples, a Wappo owned what he made and used himself. Anything made or used jointly was the common property of those concerned. Gathering tracts were apparently owned by indefinite groups of relatives, but hunting territory belonged to the whole tribelet. Incorporeal property scarcely existed, and there seems to have been no fixed rule of inheritance for any kind of property.

Property owned individually, jointly, tribeletally. Each person owned his clothes and body ornaments. A man owned his own weapons, musical instruments, pipe, etc.; doctors their outfits and possible their songs, although latter uncertain; women their baskets and utensils, which they made. In general, anything made by a person and used exclusively or chiefly by him was his to do with as he wished.

Gathering tracts and acorn trees also owned jointly by groups of relatives. Others not allowed to molest them.

Title of house not vested in single person, but jointly in all adult occupants.

No fixed rules of inheritance of property. Bead money left to dead person's children and paternal and maternal nephews and nieces. Wife or older relative did dividing. Perhaps one-third or one-half of bead money thrown on funeral pyre.

Chieftainship and Government

The so-called chief was little more than a natural leader, one with excellent physical, mental and moral qualifications. He had little authority over the rest of the group and no means of enforcing his commands or wishes other than his own physical prowess and that of his relatives and immediate following. Although the chief was the acknowledged leader and was supposed to be concerned with the welfare of everyone, punishment for a wrong as serious as murder was fixed by the relatives of the slain and the slayer, and not by any tribal police organization or court of arbitration. The men of the settlement sometimes met to discuss affairs of interest to the entire group, but no votes were cast and there was no governmental machinery for carrying out their decisions. Such a description would fit most tribes of Central California and many other peoples of the more primitive world.

Warfare

Like the Pomo and other central California Indians, the Wappo did not glorify war. Small private raiding or avenging expeditions were probably more common than intersettlement battles. Even a large battle was likely to cease if a prominent man were killed, especially the one who was responsible for the outbreak. Scalps were not taken. There was no war for conquest, although Barrett tells of a Southern Pomo group, defeated by the Wappo which evacuated Alexander Valley in favor of their conquerors.

War causes, in order of probable frequency of occurrence: poaching, deliberate murder, poisoning.

Weapons: bow and arrows, spear, sling. Every warrior carried bow, arrows, and spear. War arrow flint-pointed. Spear had either wood or flint point. Sling same as that employed in hunting but stones larger than those used for birds. Bow and arrows and sling used when 2 sides lined up some distance apart. Spear chiefly for surprise night attack.

Warrior put black, white and red paint on upper part of body and striped these colors across face with fingers. In his hair, wore whole wing of eagle or other large bird, held on by hair net and hairpins. Loin cloth probably modern. No armor. No shield. Boys not taught to use quiver as shield.

Abstract from H. E. Driver Bulletin.

Woodbridge Metcalf
Extension Forester
April, 1953

PIONEERS OF LAS POSADAS

A story of Milton and Sally Dodge Morris and their relatives who pioneered at Las Posadas in 1878.

by

Edith Gregory of 1721 Hopkins Street, Berkeley, California. 1938. (Granddaughter of Mr. and Mrs. Milton Morris)

LAS POSADAS
GRAVEYARD KNOLL

Graves of those who have gone before have an interest for most people, especially if in unusual places. They excite curiosity and make us wonder what kind of person lies there, and why. Here are brief accounts of the people who lie buried on Graveyard Knoll, at Las Posadas, or, as we knew it in childhood, Lookout Hill of Uncle John's ranch on Moore's Creek, before the place was chosen by Grandfather Morris as the spot where he wished to be buried. These stories are written for those who have seen these graves and been moved to wonder who are the people who lie here.

Long before Las Posadas became state property, Uncle John Morris deeded to the State of California the "Graveyard Knoll" believing that he was by that act securing protection for the graves of his family. They were no ordinary people who sleep there. They were pioneers, history-makers. They lived hard lives, full of poverty, sickness, and toil; but they carried civilization with them: cleanliness, religion, law and order. Among their descendants are farmers, forest rangers and guards, expert electricians and mechanics, gardeners, teachers, scientists, missionaries and journalists.

There are seven graves on the knoll; of Grandfather and Grandmother Morris; their son John, who was the owner of the Moore's Creek Ranch; his first wife, Melissa; his little daughter, Delphine; a cousin, Martin Modrel, who came from Missouri, sick and poor, and was cared for here till his death; and a tiny baby niece, Emma Martin.

GRANDMOTHER MORRIS

SALLY DODGE MORRIS

1811 - 1901

A three year old child sat on her mother's lap, frightened. There was a dull, far-away booming in the air. Mother was crying. Father came in, and when he opened the door the booming noise came with him, filling all the neat Vermont farm kitchen. He took his gun from above the fireplace, kissed mother, and went away. Kisses were not common nor lightly given in that austere New England family. Father went away, but the booming stayed on and on, seeming to shake the granite hills. That is Sally Dodge's first memory of her home in Barre, Vermont; how, in 1814, as a little scared girl she heard the guns of the British at the Battle of Lake Champlain, when Father went away to fight.

Father was a fighter but not a soldier. He was a preacher. Seven years after the cannon-fire on Lake Champlain, he, the Rev. Nathaniel Brown Dodge, was asked by the American Board of Missions to lead a party of Missionaries to the wild Osage Indians of Western Missouri. The name of Sally Dodge's father is in Missouri history books, because he was one of the founders of civilization there. Sally went along. Here is her own story of the long journey:

"When I was nine years old, in the winter of 1821, my father, the Reverent Nathaniel Brown Dodge, was sent to found the Christian Missions among the Osage Indians. From our home in Barre, Vermont, he took his family to join the rest of the missionaries in New York. We then came on steamers to Philadelphia, where we embarked in large crooked-bed wagons, difficult to get in and out of; and set out across the Alleghany Mountains. Bad roads. We were cooped up, young and old together. Some were sick. On long hills the driver would invite us out to walk,

and we enjoyed the exercise much better than the inclination to sea-sickness in our tight covered wagons. One day I set out to walk as far as the teams went, and did twenty-two miles; but next day my feet were so sore that I was never allowed to try again.

"At Pittsburgh we found two keelboats built for our voyage down the Ohio and up the Mississippi and Missouri Rivers. We made good time down the Ohio, but when we began to ascend the Mississippi River our troubles began. We worked the boats upstream by cordelling with long ropes, which were rolled and taken in skiffs the ropes' length up the river and fastened to trees. Then all hands would pull for dear life until we reached the tree. Frequently we were stuck on mud-flats for half a day at a time.

"After traveling on these rivers for four months, we came as far up the Big Osage as our boats could go, and stopped at a place called 'Rapiddecow'. We founded our Mission on the banks of the Big Osage, christening it by the name, Harmony Mission. All our goods had to be unloaded and conveyed fifteen miles up the river in skiffs where the Indians were swarming on the banks and we could not understand a word they uttered. We built cabins of logs, sixteen feet square, joining cabin to cabin in a long row. The roofs were made of shakes weighted down with heavy logs on top. Each cabin had one small window. How nice it seemed to live in these cabins after our seven months journey and hardships!

"After getting into our cabins, we put up a house that should answer for a schoolroom below and storeroom above. The stores consisted chiefly of clothes for Indian children. We all went to school in the same room, white and redskins together. We went to the same table to eat. Our coffee was made of parched wheat sweetened with honey. At last our flour and meal gave out. Then we had two large iron kettles put up in an arch, and every day boiled corn for hominy. For six months this was all our living; not a morsel of bread did we taste. Nearly all our Mission became sick and helpless. Having suffered so much for want of food before getting our mill built, we used to say that the Mission ought to be called 'Hominy Mission' instead of 'Harmony'." (From a manuscript written by Sally Dodge Morris, in possession of her grandchildren.)

Sally grew up at the Osage Mission. As she played with the little Indian girls, she learned from them some things that few girls of her time knew. She learned to carry jars of water and baskets of corn on her head. This gave her a strong, straight back and a smooth graceful way of walking. She could even balance a full pail of water on her head and walk home from the spring carrying a pail of water in each hand, never spilling a drop.

Also Sally learned to swim. This was a most unusual accomplishment for a white girl at a time when the fashion was for girls to be frail and delicate. On hot days, though, when the little Indian girls went into the water, Sally would go too, and soon was splashing and paddling along with them. When she grew up she became shy about her Indian lore, though she would steal away to swim by herself when there was a chance. Once, while crossing the Plains with her husband and children, their wagon-train camped for a few days beside a cool clean river. At twilight Father Morris came to the camp-fire, laughing silently, and beckoned the children to follow him, but make no noise. He led them to the river bank.

"Look," he wispered, "out in the river beyond the willows!" There they saw someone swimming back and forth and diving like an otter across the big pool. It was their mother! When the amazed children began to exclaim and giggle, she stood up in the shallow water, her old linsey-woolsey dress that she used for a bathing suit clinging dripping to her body, and began to cry, ashamed.

Little Sally was a favorite among the Indians; and besides, the chiefs regarded her as something sacred because she had fiery red hair. They named her Pah-su-cha, which means "Redhead". Medicine-men and warriors coveted a lock of this brilliant hair to weave into a Wa-xo-be, or charm, to bring luck in war or hunting. Her father warned Sally never to give or sell a single hair, nor to allow the warriors to touch her head. He was constantly refusing to allow Sally to be adopted into the Osage tribe. The chiefs begged for her again and again, believing that Pah-su-cha would bring safety and good fortune to their tepees.

From the Osage girls, there at Harmony Mission, Sally Dodge learned to talk the Indian language. She helped the missionaries in making a primer of the Osage language, and a translation of the Bible. When she grew up she was interpreter between the Indians and the United States soldiers who were sent to keep the peace. The Osages were a fierce tribe of fighters. They frequently broke the treaties that their chiefs made with the white, and there would be scrimmages followed by councils and pow-wows and new treaties. Sally would stand between the scowling Osage chiefs and the stern American officers, translating and repeating phrase by phrase, frightened but steadfast, for although she was a timorous woman, she faced things bravely.

Once the Indians came plundering and burning cabins, killing cattle and hogs and taking a scalp now and then. There was a skirmish in which one of Sally's brothers was killed and another wounded. The few settlers gathered and sent a messenger for help. Then they took Sally Dodge with them to interview the hostile chiefs. She said: "The United States Government is going to punish you for your treachery. Go back to your tepees and hide your weapons. Go today." Then, as the Indians hesitated, Sally remembered that help had been sent for, and though no answer had come, such faith took hold of her that honest little Pah-su-cha, who would not lie, even to an Indian, found herself threatening: "Go! If you wait till tomorrow there will be a hundred United States dragoons here to drive you to your villages. Do not wait!" The Indians retreated to their villages, and that night a company of one hundred United States soldiers appeared on the Osage River!

Her saddest ordeal was acting as interpreter when the U.S. Government moved the Osages to their present lands in what is now Oklahoma. She read the treaty to the Indians, translated their questions to the U.S. officers, and showed the chiefs where and how to sign the documents. Then the time came when the Osages must leave their hunting-grounds and travel west to strange, barren lands in the Indian territory, lands thought to be worthless. Sally shut herself up in the cabin, not to see them go. For three days and nights the Indians went by, the squaws carrying the household goods. Sometimes a pony dragged a traverse, or rack of poles loaded down with skins and baskets. For three days and nights the slow procession moved on unbroken. As they went the exiles sang a mournful parting-song.

"Farewell, Pahsucha," they sang, "Farewell, Farewell, Pahsucha!"

All the three days and nights the wailing was continually in her ears. As each group came to the Mission they left on the doorstep a gift - a pair of moccasins, a handful of corn, some jerked meat, or a piece of calico torn from the bolt given them in payment for their lands. Then, as they moved on, another group came up wailing: "Farewell, Pahsucha, Farewell, Pahsucha!"

About the time that the Missions were flourishing, a tall, dark-eyed, young Virginian came limping barefoot into Harmony Mission. Milton Morris had turned his back on family and friends and walked to the utmost border of civilization to escape the sight of human slavery. Welcomed at the Mission, he fell in love

with the little Yankee, Red-haired Pah-su-cha; and presently, at the New Boudinot Mission, across the border in Kansas, Rev. Nathaniel Dodge read the ceremony which united Milton Morris and Sally Dodge, the first white couple to be married on Kansas soil.

Milton Morris was licensed a Methodist preacher. For about twenty years the family lived in Western Missouri, where all but one of their eight children were born. The hot question of the time, the human slavery problem, caught up with them as farms and plantations replaced the wilderness. At last, unable any longer to bear the quarrels in the church and the enmity of a slave-holding community, Milton and Sally Morris sold out, paid their debts, loaded their children into an old wagon, and set off for Iowa, the free territory. They found Iowa full of Mormons, a crowded stopping place for the Salt Lake caravans; and Sally Morris was unwilling to bring up her children among that sect. For a few years the family, the older boys now well grown, farmed in Eastern Nebraska on prairie lands bought from the Indians when that territory was first opened to settlement. There the eldest daughter, Sarah, was married, the first white girl to be married on Nebraska soil, as her mother was in Kansas. Once, when all the men were away, Sally, armed only with a poker and her knowledge of the Indian language and character, chased off a band of plundering Pawnees that were killing her chickens and trying to steal her cooking-pots. Then, after the sudden death of one of their sons, the rush to California overwhelmed the Morris family. They changed their farm for ox-wagons and provisions, and in 1857 made their first crossing. Four months they travelled, from the Missouri River to the Trinity Mines of California. They had lived among the Border Ruffians of Missouri, the hostile Mormons of Iowa, but life in Trinity was the roughest yet. Father Morris preached - in the bar-room of the miners' hotel. Sally Morris and her daughters did everything; housework, of course, and sewing, chicken raising at one dollar per egg, laundering at one dollar per shirt; and nursing the sick for miles around free of charge from pure neighborliness. The three older sons mined and farmed. Still they did not prosper, even after moving into Napa Valley, and at last they decided to go back to Iowa.

This was in 1863, while the Civil War was raging. One son was fighting in Virginia. The journey was doubly dangerous on account of hostile Indians, and when accomplished, brought no profit. Within three years the hard times following the close of the Civil War had reduced them to such misery that their second son, John, who had prospered in the Idaho mines, came and brought them again to California along the slow, dusty, Overland Trail.

After this, Milton and Sally Morris were genuine Californians, though they did make one more trip "back to Nebraska". This time, though, in 1869, they travelled by train, and accomplished in five days the distance to the Missouri River that had taken them four months with the slow ox-teams. The trains were not to be compared with those of today. They had been running only a few months and there were no dining cars nor Pullmans. A board laid across two seats supplied the bed and the passenger furnished his own bedding. One paid as much for a ticket to Omaha as to New York. Worse yet, at Ogden, this train-load, women, sick boy, everybody, was transferred into freight cars which had not even been fitted up for the use of through passengers. There were no seats nor dressing-rooms. By night some of the bolder and rougher men had started a riot, news of which was telegraphed to the Superintendent of the road, and about midnight the passengers were moved into a better train.

This sick boy, the youngest son, for whose health this journey was made, died during the winter, and as soon as the snow was gone, Father and Mother Morris returned to California to stay. When Uncle John, their son, bought the Moore's Creek Ranch, they came here to live, and spent their remaining days on Howell Mountain, he preaching, she living a busy, neighborly life.

It is a long way in time and space from Vermont in 1811 to California in 1901. Across a continent, step by step, Sally Morris brought civilization. A clean cabin, clean dishes, clean clothes, clean beds and quilts; delicious food from scanty provisions; care of chickens; milking cows - think of the work and planning these things cost. Grandmother had to be nurse and doctor, helping babies into the world, and glad that she had learned something of the skill of her brother, Dr. Leonard Dodge. Along with the lore of the pioneer woman, she had place for refinement. She read aloud well, and wrote a tiny clear hand that economized precious writing-paper. She pieced log-cabin quilts for recreation. She taught her children gentlemanners and orderly behavior. She planted a strip of flowers along the ditch.

GRANDFATHER MORRIS

MILTON MORRIS

1807 - 1891

Away back in the eighteen-twenties, young Milton Morris rode up to a neighboring East Tennessee plantation on an errand for his grandfather Fores. As he was tying his horse to one of the locust trees of the Avenue, the boy noticed three men come out upon the verandah of the Big House, leading a well-built young negro girl who had a baby at the breast.

"Here, I didn't sell you the picanniny," remarked the master, not ungently, taking the child and handing it to one of the negroes loitering round. The two buyers led the slave-mother half-way toward the light wagon that stood hitched near the gateway, when, with a frightful scream, she broke away, rushed back to the verandah and tried to snatch up the baby, sobbing and making queer animal-like cries. The negroes scattered, taking the child with them; the master disappeared indoors, and the two slave-dealers caught the woman and dragged her, fighting and screaming, toward the wagon. As they passed Milton, the boy heard one say: "I'll teach you to squall!" and saw him strike her with his whip. She only shrieked and fought the more, until they had dragged her, beaten and exhausted, into their wagon. The sight not only darkened that morning for Milton Morris, but changed his whole future. It roused in him such a hatred of the injustice of slavery that his life decisions were ever afterwards the result of what he had seen that day.

Of Sally Dodge, we know her acts and accomplishments; from piecing quilts to chasing off plundering Indians - actual practical doings. The life of Milton Morris is a record of feelings, thoughts, and beliefs. He was born at Lynchburg, Virginia, in 1807. His father died while the children were still young, and his mother who was Lucy Ford of Knoxville, Tennessee, took her family home to the Old Plantation. They were not too warmly welcomed, and Milton Morris had to work in the fields with the field hands. It was while he was hoeing, alone, that there came to him his second great experience, his conversion.

"When a lone boy," he says, "having hardly ever heard anyone pray or preach, I became powerfully convinced that I was a sinner. While all alone in the cotton-field, with my hoe in my hand, I tried to pray as best I could. I did not know what to do or say, but God put it into my mind to praise His Name, and there, with hoe in hand, both arms outstretched, I shouted: "Glory to God!" Then the world changed. All looked beautiful; the sun, the sky, never looked so bright! Alone in that cotton-patch with no one near, God came down to me!"

Whatever this mysterious experience was, it had a profound influence on Milton Morris' character. It led him to break away from the slave-owning Fords, his mother's people, to leave and try to forget them completely. He could not share their home nor their money. Finally he left East Tennessee, afoot, working his way westward, hoping some time to find a land where there were no slaves. One day in 1830 he limped into Harmony Mission in Western Missouri, still barefoot, his clothes in rags, six feet two inches of straight, hard muscled, free man. And Dr. Nathaniel Dodge, head of the Osage Missions, gave him his daughter Sally in marriage, because, says Dr. Dodge: "I found him honest, sober, and industrious." They were married in 1831, at Boudinot Mission, on the Kansas border.

From this time on Milton Morris' history is that of Sally Dodge Morris. There is no record that they were ever apart except once for a few months in the winter before they started on their first trip to California. Milton Morris was licensed a Methodist preacher. Frontier preachers had very uncertain pay, and performed many a marriage for no fee at all. Besides, they were expected to be hospitable to all visiting brethren, even to sharing the last loaf and giving up their own beds. Milton Morris tried farming, to help out his expenses, but until his three older boys were large enough to work, he had poor success. One winter the only piece of money they saw was a single silver dollar that Sally Morris earned by making a coat. Another year the whole family went in the Fall to the river-bottoms and cut down pecan trees for the nuts. The women gathered up sixty bushels of nuts after the men had cut off and dragged away the larger branches. The sixty dollars brought in by the sale of the nuts had to supply the family of eight with "store provisions" for a whole year. It took much scheming to hold out enough from the family share to buy Father material for a warm overcoat.

During the years from 1840 to 1860 Missouri was filling up with a farming population, most of them slave-owners. Father Morris did not mention the slave question in his sermons, but everybody knew his anti-slavery opinions, and several times he was brought to trial in the Methodist conference on charges of sympathy with Northernism. Though the Conference cleared him of blame, the Presiding Elder refused to renew his license. It was then, in 1849, that Milton Morris again exiled himself, leaving the land that had been his home for almost twenty years. He took his wife and children, and with horse and wagon journeyed northward into Iowa, camping on the way. Here, free to speak his beliefs, he had his license renewed, and his home at Council Bluffs was church and center of Methodism in the midst of throngs of mormons. Since Sally Morris could make herself understood by the Indians, Omohas, Otoes, and Pawnees all speaking dialects similar to the Osage, her husband had no trouble buying land from the Otoes of Nebraska. In 1854, the year the Indian Teeritory of Nebraska was opened to the whites, he led a party of ten families to settle on the west bank of the Missouri River, near where now stands Plattsmouth, Nebraska. His sons broke the new prairie-land with ox-teams and harvested rich crops. They had a hand in organizing the State Government and electing the first legislature of Nebraska. In the Morris cabin was held the first Quarterly Meeting of the Methodist Church in Nebraska. Their daughter Sarah was the first white woman married in Nebraska. The marriage record can still be read in the County Court House.

Prosperity was looking their way when a favorite son, Nathaniel Brown, named for his missionary grandfather, sickened and died.(1) To his father, this

(1) - Nathaniel Brown Morris' grave, long "The Unknown Grave", has this year, 1938, been identified and marked, in a cornfield in Cass County, Nebraska.

seemed the Hand of God afflicting him for the unknown sin that he feared lived in his own heart. He could not bear the sight of that grave under the oak tree near the cabin. As always, his feelings controlled the actions of others. They sold the farm, to join the ox-caravans plodding up the Platte River toward the West. This, in 1857, was the family's first crossing of the plains.

Then, always with Sally at his side, Father Morris lived for a time in California, preaching in the Trinity mines and at the Old White Church in Napa Valley. In 1863 they made a war-time retreat from California to the Missouri River, toiling and preaching on the "Delaware Reserve" in eastern Kansas, where their son John found them in poverty and brought them again across the plains in 1867. They settled in Napa Valley near the Old White Church, and except for a train trip to Iowa in 1869, on the just-finished railroad, travelled no more. When John Morris bought the Moore's Creek Ranch in 1878, his father accompanied him here, helped him develop it, and at last died and was the first one buried on the knoll. He had chosen the place himself, as a burial ground.

What was he like? A tall, long-armed, sharp-eyed man, with a shock of snow-white hair that stood up from his forehead to make him look even taller. He was a simple, straight-thinking man, who knew what he thought was right, and did it; knew what he believed and made others believe and do it. He set an example of strength and earnestness. For instance: he loved music so much, he confessed, that the sound of a fiddle would draw him right toward it, but he thought music was sinful because he loved it so, and would not listen to any instrument. From boyhood he had chewed tobacco, but after the Civil War, there on the Delaware Reserve, he had not enough money to give tobacco to the discharged soldiers who came by, begging for a chew. He made up his mind to quit chewing, since he could not share this luxury, and did so, though for a time he suffered intensely.

Does he seem narrow and hard to you? Perhaps he was. He belonged to a hard, crude civilization. There was surely some quality of leadership in him, suited to the times in which he lived - pioneer stuff. If you can find any of his neighbors, they will tell you that he had their sound respect.

UNCLE JOHN

JOHN MILTON MORRIS

1835 - 1907

John Morris was born in the Osage Country of Western Missouri and endured the wretchedly hard lot of a pioneer boy. Hard work and poor food made him a sickly, under-sized lad; a lively, underschooled mind made him a restless, intolerant man. He shared the migrations of his parents from slave-holding Missouri to Mormon Iowa in 1849, across the Missouri River to the Indian Lands of Nebraska in 1854, where he helped elect the first legislature in Nebraska; and across the plains to California in 1857. He mined in Trinity, farmed in Napa County, was guard at San Quentin prison; mined again in the Nevada Silver Mines; was a prosperous store-keeper in Idaho; sent his brother as his substitute to fight for the Union because he could not qualify physically as a soldier; went to New York via Isthmus of Panama after the War, and gathered together his family who had returned to the Middle West during the war, and brought them again overland to California in the year 1867. After a railroad trip East on the newly finished transcontinental railroad in 1869, when they took "Brother Eddie"

to Iowa to die, John fell upon hard times and coming to California, started afoot as book-agent, selling and delivering books all up and down California and Oregon. He walked himself into health and prosperity, married his wife Melissa, and bought the Moore's Creek Ranch as a place in which to restore her health. After her death the Ranch was a refuge for all of his relatives upon whom misfortunes had fallen; his brother William and family; assorted nephews; a cousin and his wife, who lived there several years.

Melissa left him one son. Later he married again, and four daughters were born to him. About the end of the Century the hardships of his early life broke down his health, and he lived in pain till his death in 1907. A fierce, loud-spoken little man, self-willed, active and generous, he accomplished much.

AUNT MELISSA

SARAH MELISSA (HARMON) MORRIS

1842 - 1880

When Grandfather Morris died and by his burial "Lookout Hill" became "Graveyard Knoll", Aunt Melissa had laid for over ten years in St. Helena cemetary. But Uncle John wanted his family kept together even in death, so he had his wife's body removed to this family burial place. After all, it was for her sake that he had settled on Moore's Creek.

Melissa Harmon was a native of Foxcroft, Maine. She had come to Eureka, California, in the early 1870's, to keep house for her brother Charles, and there in her brother's home she met John Morris, the travelling book-agent, and opened his eyes to beauty, her own and that of the world. Even her pictures, in the old-fashioned dress of her time, show how beautiful Melissa was. Besides lovely features, she had curling red-brown hair, a fair skin, and magnificent dark eyes. Her daintiness and grace of person, joined with good taste in dress, were a revelation to John Morris, the pioneer, to whom fashionable women were "fast women", and beauty was vanity. Melissa worked in a "Dressmaking Establishment" where she was in constant demand to choose materials, patterns and trimming for the ladies of the town, yet she kept her brother's house perfectly, was quiet, well-mannered, and modest. John Morris could not keep away from the Harmon house, and prolonged his business in Humboldt County until he had courted and won his "Yankee Bride". They were married in 1875.

Melissa loved her husband devotedly, but there was a shadow over their married years. Possibly some of her fragile beauty was due to the disease that was already menacing her life, tuberculosis, feared then as cancer is today. Three years wandering from place to place, then the discovery of Moore's Creek as "the healthiest spot in the world", and two years here on Howell Mountain - that was all that was left to her. It was long enough to win the hearts of all the Morris kin, and to make the Moore's Creek Ranch sacred to her memory.

"How beautiful it is out of doors!" she would say, and her husband wondered what she was seeing. Where he saw only "dirt and rocks and unprofitable timber", she saw fair earth and flowery hills, shadowy forest and bright sky.

LITTLE DELPHINE

DELPHINE EDEN MORRIS

1896 - 1899

Delphine Morris was John Morris' eldest daughter, the child he loved most of all. She lived three happy years, a quiet, docile little creature whose quaint ways and odd sayings amused and charmed her busy father. It is told of her, that like other children she would try to catch the big yellow butterflies, but with an unchildlike persistence, for hours at a time; and, though she never caught one, she never lost patience nor grew peevish over the unsuccessful chase.

Before she had lived to know anything but loving care, she became just a happy memory.

"In small proportions we just beauties see,
And in short measures life may perfect be."

THE HISTORY OF LAS POSADAS FOREST

The first people that we know of in Moore's Creek Canyon were the Indians. We can prove that they lived here for they have left relics of their life beside the creek, but until these have been collected and studied, they have no history.

The first settler that I know anything about was an Irishman named More or Moore; the name of the creek is all that he contributed to the place. He did not own the land, nor did Musso who was living here when the history - or the written record of the ranch begins. In fact, the King of Spain was the first owner to have and give title to a part of Las Posadas Forest. The level tract on top of Howell Mountain is a part of the old La Jota Grant, which was given to Colonel Yount when California was still a part of Mexico.

In 1878 John M. Morris paid Musso a thousand dollars for his right on Moore's Creek. Then John Morris had the land surveyed, and had his title patented by the United States Land Office. Later he bought from the owners of the La Jota Grant, and from other people who had secured Government land, until he had over six hundred acres. After his death, his heirs sold the property to Mrs. Anson Blake, who has given it to the State of California as a holiday place for us all.

John Morris brought his family with him in 1878; his wife, Melissa, his two year old son, Vincent, his father, Milton Morris, and mother, Sally Dodge Morris; and an orphan nephew Mitchell (called Mittie) Bartholomew, about seven years old. They lived and the elders died here and are sleeping in the little cemetery on the knoll. Here is a bit of their history, for they were pioneers of the sort that gave our State some of its better institutions.

Milton Morris (Grandpa) was a Virginian, born in 1807. He was a Methodist preacher, a tall, white-haired, restless man, always ready to start somewhere; never having any property, but invariably winning respect and friendship. His wife, "Mother Morris", was born in Vermont in 1811. She came to Missouri in 1821 with her father, the Rev. Nathaniel Brown Dodge, who established Missions among the Osage Indians, and she grew up there and became interpreter when treaties were made between the Osages and the White men. She was the first white woman married on Kansas soil, and her daughter's was the first white marriage in what is now Nebraska. The stories of this pioneer family would fill a book. They came to California in 1857, returned to Iowa in 1863 by ox-wagon, and came again to California in 1867..Ox-wagon Commuters. That was not enough. In 1869, about three months after the transcontinental railroad was finished, they took a train ride to Iowa and back, having almost as adventurous a trip as their ox-wagon journeys, though a much shorter one - five days instead of four months.

John W. Morris was a pioneer of six states. Born in the backwoods of Missouri, he lived among the Mormons in Iowa, was one of the first settlers in Nebraska, when in 1854 that state was opened to settlement. In California he mined in Trinity County; spent a winter in Nevada when the silver mines at Virginia City were at their richest; was two years in Idaho when pack-trains supplied the Boise basin.

Some day Uncle John's autobiography will be published, full of pictures of pioneer life. Here are some pages condensed from it, in which he tells of the Moore's Creek Ranch.

Home at Last - Moore's Creek 1878

I Establish A Home for my Family

(Condensed from the Memoirs of John M. Morris)

I determined to give up all consideration of making money, and to put my entire thought to prolonging the life of my Dearest Earthly Treasure. We spent the summer (1878) traveling and camping in the Coast Ranges between Napa and Humboldt Counties, and as in the Summer before, my wife seemed to improve. Late in the season I left the family in camp on Cobb Mountain in Lake County, with my parents and my young nephew (the orphan Mittie Bartholomew) who had been with us in all our journeyings. I went on a land hunt. We had spent the last two summers traveling to see if that would bring any change for the better. Now my design was to find a place to live where conditions would be most favorable for Melissa's health. I never gave a thought to adding one nickel to my wealth.

Down through Pope Valley and Chiles Valley I kept hearing about a place on Howell Mountain owned by a man named Musso. This locality was thought unsurpassed for sufferers from lung trouble. I came to the place and found it to be a claim on Government land. The price was one thousand dollars. On looking it over, I had seen nothing that suited me so well. Returning to my wife and child on Cobb Mountain, I realized that we must get into Winter quarters at once, for poor Melissa had been near dying while I was gone. Unless Father and Mother went along to live with me, I would not buy, for my wife was too sick to go far from neighbors unless she had companions. So I sent my parents to look at the places I had chosen, and if they liked either one, to pay some money down to bind the sale. They went and looked and made payment to Musso on the Howell Mountain claim. It was a squatter's right to unsurveyed Government land on Moore's Creek, Napa County. We broke camp and two days later, October First, 1878, took possession of the Moore's Creek claim.

This was a frosty, cold October, and we had only a little two-room shanty of slabs to move into. There was a fireplace in this shanty. Our goods were pretty well scattered in upper Napa Valley, stored in houses and barns of the neighbors we had lived among. We had a fearfully rough mountain road to haul over, twelve miles from Saint Helena. We were within one mile of Chile's Valley, half-way down the mountain to the East, with a very steep rough road on that side. There was hardly a passable wagon road into the claim we had bought. On the West, one mile uphill brought us to the top of Howell Mountain, a country of flat poor lands covered with fir, pine, oak manzanita, madrone, and in the gulches, some redwood. The water privilege was the best part of the purchase. Excellent springs in the redwoods formed a creek that would irrigate ten or fifteen acres of flats and hillsides. But most of the water came out on Grant lands owned by one Watson, cashier of the Bank in Napa City. Hence we were buying for the most part in futures. There was nothing worth mention done on the claim; no substantial fencing, no barn except a long shanty, no land cleared. We had tackled a forest of rock and timber, with little good soil, but said by doctors to be the healthiest place in the world.

First, we set about building our house. We hired teams, bought lumber, nails and doors and had them hauled in. Mr. H. Risley of St. Helena was hired to do the carpenter work. We built up fires out of doors to keep us warm. Mr. Risley got the frame up, and all the windows in and doors hung before the end of October, and the pantry well shelved up. We left Father and Mother the slab-house with

its two rooms and stone fireplace, and for the first time since casting our lot together, Melissa and I were in our own home, a rough little new board house of two rooms and pantry. We felt we were Monarchs of all we could see, for we claimed all the lands our eyes could behold from this basin at the head of Moore's Creek. We soon added another shed room for a kitchen, and were very comfortable. My farm work was close to the house, fencing, grubbing, and plowing with a small plow and one horse. The cabin where Father, Mother, and Mittie lived was only fifty yards away and we had a milk house under the hill on the bank of Moore's Creek, within thirty steps of Mother's door. There we kept our butter and milk cool. I bought two good cows and mother had made Mr. Musso agree to give her a cow when contracting the first payment, before we moved. There was enough hay on the ranch to feed the three cows and one horse for six months. Mother went to raising chickens and making butter to sell, and nearly supported Father and Mittie independently of my help. We started our Moore's Creek home with money loaned out, and it was strange how I prospered there. For the most part I was well off financially from the very beginning of our life on the Moore's Creek Ranch. We could very easily have changed the name to Morris Creek, for half the people coming in to fish or visit actually thought the true name was Morris Creek.

This is how the ranch came to be named. Away in the forties a family by the name of More had settled here and lived for some years. The husband was a drunken Irishman. All of a sudden the Old Lady More took sick and died. Some of the neighbors hinted that the drunken husband may have helped his wife off from these mundane shores, but the suspicion was not sufficient to cause anyone to dig up the old lady after she had been buried at St. Helena. All agree that never was there such a time getting any one into a coffin or out to a cemetery. She was very large and so swollen up that they could hardly get her into the coffin. The road to St. Helena was nearly impassable, so everybody engaged in that act of philanthropy remembered ever afterwards their last respects to Old Lady More. Moore's Creek, it is, not Morris'.

Half my time was spent indoors. My wife seemed better than in the previous winter, but could not do more than take care of our little boy, and show me what she wanted done. I devoted myself to housekeeping, and the ladies coming to visit us were surprised at the meals I could get up for them. They did not know about my cooking for a year in our hotel in Minersville, or that I had spent five or six years "batching". We had plenty in the house to cook, which was the principal key to the mystery. As soon as we had our small house up, the neighbors came pouring in to visit us. Teachers, preachers, and doctors came without being called for. In this out-of-the-way place we had three visitors to one who came in the thickly settled Napa Valley. Three preachers in one week came to see my wife. On Spring coming on, Melissa was able to go down into Chiles and Pope Valleys to visit her new neighbors. It was only one mile from our place down to Chiles Valley by the steepest, roughest, worst washed out road I ever traveled. Yet I fixed it up so we were able to get out that way.

My dear old father, now over seventy years old, was a wonderful help on this ranch, not only in the work he did, but as a spiritual adviser to my wife. He came in very often and read and prayed with her and talked to her on the state of her mind. She had the greatest confidence in him. My father was terribly dissatisfied about our location. He would roam about and grieve over "settling on a pile of rocks, on a place where nothing could be made, away off from any one, and where there was no prospect of future remuneration." He was no judge of Earthly business, for his mind was wholly devoted to Spiritual things.

The forest grew down to within thirty or forty steps from our house, on two sides. We cut our own wood, and had not far to carry it on our backs. There was an acre or two of garden land partly cleared on one side of the house, also five or six rows of blackberries, about 150 vines. Some two dozen apple trees had been set out the Spring before we moved onto the place, and eight to ten peach trees nearly big enough to bear. But the rabbits had come in before we bought, and Musso had let the pestilential scamps eat the bark so that I told Musso I would not give twenty-five cents for the whole twenty-five apple trees. Yet by wrapping them properly, we saved all the trees but two. The pigeons, like the quail in the days of Moses, gathered into More's Canyon so thickly that I could never have believed their numbers without seeing them with my own eyes. They blackened the skies and when they flew the roar was like distant thunder. I had read and heard talk of Pigeon roosts in Florida but never had realized the truth. These pigeons were not fat as we had seen them before. There were plenty of speckled trout in Moore's Creek, but I did not know how to catch them. Brother Sawyer - of Sawyer's Tannery - camped on our place in the summer and came every day to see my wife, bringing her a few fresh shining trout. The woods were full of deer, too, and we would see the hunters carry them off. They would never give us a mouthful of the venison, shipping the carcasses whole to San Francisco.

The winter (1878-79) was a severe one for Napa County. Ice froze on a little pond till our horse walked on the crust. In the Spring of 1879 we had the highest water for years. In April Mother went to Napa Valley, and while she was gone the Valley was flooded so she could not get home. There were over three feet of water on Napa River Bridge. Next day, Melissa's brother, John Harmon who was on a visit, started to help Mother. He met her on the Howell Mountain Grade. She had two or three men helping her pass the slides, where she had been told she could not possibly get over. She would have the men take the horse out and pull the light spring wagon over the mucky slide and lead the horse round the slide up on solid ground and then hitch up and drive on. She was bringing a load of groceries for the ranch, and had been gone from home for three days, with us all wondering where she had put up. When John Harmon was starting to meet her, he remarked: "Oh, she can get over the grade anywhere with that light spring wagon." "Yes," said I, "but you will not find it empty. If it were Father, you would find the load stored at the first house he came to, but mother will stay with the cargo." Sure enough, when they drove up, there was the full load of groceries. To this day the teamsters wonder how "that Old Lady" ever got through those slides and reached home safely. They did not know that this "Old Lady" had crossed the Allegheny Mountains when a child of nine years, that she had crossed the plains three times in ox-wagons, and had lived at the Trinity mines where all provisions were brought forty miles on pack mules. Engineering this gentle horse and light wagon was a small thing compared to what she had passed through.

The winter (1879) passed, the month of March came, and with it came the desired rest My Melissa had longed for. She had suffered so much that it seemed a sin for me to wish her to stay. She died on March 12, 1880. This closed the five years of our wedded life, the happiest of any to me, except, perhaps, the first two years after I was converted to God. We had lived in our own home for less than two years. Melissa always did like the Moore's Creek Ranch. As long as she was able to walk, toward Spring she would drag herself to the door and supporting herself by the door-post, exclaim, "How beautiful it is out of doors!"

Though I felt all broken up after the Light of Our Home went out, there were many things calling for attention. Father and Mother moved into my house shortly after Melissa left us, to take care of little Vincent and cook for me. I made several trips to San Francisco to attend to surveying and filing on my land. I copy from my Journal:

Thursday, March 25, 1880. It is rainy. Took an umbrella and come to St. Helena through the mud. Blister every toe by the weight of mud on my boots. Come to San Francisco and put up at Perkins' New Montgomery Boarding House.

Friday, March 26, 1880. Most of the day at the U.S. Land Office. Deposit money in the U.S. Treasury for the survey of the land we were squatted on.

Later we filed on this Government Land, Father and I locating a quarter (section) apiece. One strange incident happened. Father and I had paid the Government Surveyor to file on this land for us. One morning I heard an axe going, up above the house. I came up and found a man laying a foundation on the best part of the land we had paid the Surveyor to file upon. Asking the man what he was doing, we learned that this land was vacant. I said: "We paid the Surveyor to file upon this land, and if what you say is true, (and I believe it is) we are beat, that is all. Now I am just going to ask you a question. I bought a squatter's claim on this land, giving him (Musso) one thousand dollars for his right. I deposited the money in San Francisco to have this township surveyed. I have gone to and from San Francisco having this business put through. Now do you think it right for you to jump in and take the land before we get our locations filed?" "No," says he. "I know of another location I'd just about as soon have as this. I have not handed in my filing, so you go ahead." I was astounded to find there was one honest man still left. We were off on the next train for San Francisco to find that this cultus(1) Surveyor had never paid in our money for filing. Later we found that the Registry Office at San Francisco was rotten as Lucifer. On depositing my first hundred dollars to survey the land they gave me a voucher in the name of J. M. Morris. On my sending down the next hundred the clerk issued the Certificate of Purchase to James M. Morris. When I pointed out the mistake and asked if it could not be changed the clerk replied: "No, you will have to sell it." "It is not my mistake," said I. "There ought to be some way to fix the matter so I can use the certificate of purchase on my entry." "No," answered McNee, the Clerk. I went to the Surveyor General and laid the matter before him. He called a page. "You go down and tell Duncan to come up here." I did not know who "Duncan" was till he came, the Clerk of the U.S. Land Register's Office. The Surveyor-General said: "Duncan, I want to know what this means. Three men deposited money in your office on one day and you got every one of their names wrong. Mr. Morris has worked up all that matter on Howell Mountain, and you give him one receipt J. M. Morris and the other James M. It's about time this were stopped." Duncan said to me: "You keep that certificate. We will make it all right." This is but once case of hundreds. Fraud and swindling carried on under the Eye of the Government in the Land Office. I came home and had to rustle to get back that ten (dollars) we had paid the Surveyor to file for us on our land.

Lying on the top of Howell Mountain adjoining my claim, there were two leagues of land located by Yount from the Spanish Government before California was taken by the United States.(2) Mr. Watson, the Grant Owner, cut up this tract into 50 to 70 acre lots and held a great sale. There was quite a tract of valuable redwood on this body of land, and Father and I took ropes and measured the best we could to find where these most valuable pieces of timber lay. My nephew, Milton Martin, came out from Iowa in October, and when the sale came off, October 15, 1881, I took him down to St. Helena to bid for me, as no one knew him. If I bid,

(1) Cultus - Chinook word meaning good for nothing, as in cultus cod.
(2) This was the La Jota Grant.

all would bid against me, thinking I knew more about the values of the land than they. I told Milton not to bid over twelve dollars and fifty cents per acre on one lot, and not over fourteen dollars on another which I marked for him. They sold everything but the tract I wanted before they got to these lots. My nephew bid off the first tract at six dollars per acre. The terms were, if you buy one lot on your bid you have the privilege of taking two lots adjoining at the same price. I stepped up and took the two tracts I thought I wanted and was starting across to the Bank for the deposits, when the Old Auctioneer hailed me. "Don't go off mad! Here, give us a bid in this!" I thought a moment, and believing there was a good spring of water on the tract, I said: "I'll give you the same for it that I gave for the other two tracts." It was knocked off to me and I got 164 2/3 acres in the redwoods on the head of Moore's Creek, embracing all the water in the Canyon; and 80 acres of comparatively level land on the top of the mountain right adjoining my Government land, all for $6 per acre.

We decided to commute our claims to Government land. By filing a Pre-emption first and living on the land six months, doing a certain amount of work, and paying two hundred dollars and expenses one could get title to one hundred-sixty acres, and then could file a homestead on another hundred-sixty acres and after living on this claim for five years, get title to the homestead by payment of office fees. We were greatly rejoiced to think that at last we were getting a home of our own, though rocky and rough, the first home for so many years. Father also had taken a homestead on 160 acres and I lived so near, both on my pre-emption and homestead, that I could be at his house all through the day, sleeping and eating at my own shanty. It was wonderful how each one got his Pre-emption or Homestead on the very piece of land he wanted; and all the shanties were within 150 or 200 yards of each other. But so it was, and we were wonderfully blessed in this location. When Father got the patent for his 160 acre lot, he gave me eighty acres and I bought the other eighty for five hundred dollars. The hundred sixty acres I bought of the La Jota Grant, at Watson's Sale and ten acres of S. D. Mitchell made me 640 acres in all. I became land poor.

Thus ran the ranch. We were annoyed by our stock getting out on the neighbors and had to sell off our cattle. We were in the meantime making fence, all of it barbed wire, and it was a great joy when we got the premises fenced. Then we turned our attention to grubbing out stumps, clearing land and running ditches. We had a fine water privilege running at the door, and raised from ten to twenty tons of hay each year. Our hands were full of business. Father preached round over the country, at Pope Valley, Chiles, and on Howell Mountain. My father became reconciled to the Moore's Creek purchase and when I talked of moving away he was just as much averse to leaving as he had been to coming into the Canyon at first. We kept getting more out of the ranch. Though the year 1880 was a year of mourning, we prospered financially. The Spring of our joy was vacant and blank, and we had no heart for the world. In 1881 we put in more garden and berries, extended the water ditches and planted black and English walnuts and some shellbark hickorynuts. Fishermen and hunters came to Howell Mountain in Summer and it became a famous place of resort. Angwin went to building and we could sell him more vegetables and berries than we could raise. The Mountain was full of healthseekers. Some forty families from different cities came to a camp on the mountain, among them the wife of Senator Jones, the Silver King. Our ranch was run over with picnickers. On my own part I cared little for company, but for the sake of Father, Mother, and the two motherless boys, we were glad to see people come. Father preached and married the young folks, because he charged them little or nothing. We had a school house built on the Mountain this year. We had abundance of company, plenty to eat and plenty of money, teams to go and come as we choose.

In November 1881 my brother William came with his family and went into partnership with me, as there was too much for one man to manage. He had a nice wife and family. We bought sheep and herded them, selling them early in the Fall of 1882. After which William and his folks went back to Iowa, leaving us more lonely than ever.

This winter the snow fell the deepest we ever saw it in Napa. Our sheep died off till we lost nearly half of them.

In 1883 I let a contract to get out my redwood timber, up to the top of Howell Mountain where teams could get at it, and I sold the oak and fir wood on the top of the mountain for twenty-five cents stumpage per cord. In the two years following we got out posts and grape stakes from the redwood timber left for clearing up. So business was running brisk on Moore's Creek. I was putting out more blackberries, raspberries and gooseberries all the time, and more apple and peach trees. There were also a few plum and pear trees. We soon had more in the way of Agriculture and Horticulture than one man could attend to, and I was once more on the up grade financially.

The grape boom had set in. People ran mad in the wine-making business, died in tanks, hung themselves up on trees. Land went up to one thousand dollars per acre. In five years some of the lands would not bring the price of the buildings erected thereon. Vineyards had been turned out to commons. The county was bankrupt. I put out no wine grapes. But grapestakes were high, so were posts. We sold the redwood timber out and paid for the land three times over; loaned money, and had more to eat than ever before in life. We bought sugar, flour, and pork by the barrel, grain by the ton, and coffee, beans and salt by the sack. People thought us crazy because we put out no grapes, shunned me as a crank, a fanatic, and would hardly speak to me; but when the crash came the same men came to shake my hands and call me sagacious, complimenting me on my good judgement. This is the way of the world.

THE REST OF THE STORY

John Morris died in January 1907, a few months after making the entries quoted from his Diary. He is buried on the "Graveyard Knoll" at the Moore's Creek Ranch, along with his parents, and his own much loved little Delphine, the eldest of his four daughters. During the time of his prosperity he had married a second time, in 1894, fourteen years after the death of his first wife.

The Moore's Creek Ranch on Howell Mountain is now the property of the State of California, Division of Forestry, as a gift of Mrs. Anson Blake in 1928. It is called Las Posadas State Forest. A portion of the forest near Graveyard Knoll has been developed for use as a Summer Camp for the 4-H Clubs of the San Francisco Bay region. It is famous among botanists as the point where outliers of the redwood forests reach their eastermost limit, and where they are found farthest from the Coast; also as the only region where redwood groves appear on the Sacramento River Watershed. (See Jepson, Silva of California, pp. 131-132.) Besides, it is the "type locality" for many Coast Range plants, several of which were discovered there. But, interesting as it may be as a field of study for botanists, geologists, and archaeologists, Moore's Creek continues best to fulfill its destiny as a place in which to be happy.

FIRE HISTORY AT LAS POSADAS STATE FOREST

FIRE CAMP AND CCC CAMP HISTORY OF LAS POSADAS STATE FOREST

SURVEY OF LAS POSADAS STATE FOREST 1931

by

E. A. Erickson
State Forest Ranger
May 1953

FIRE HISTORY AT LAS POSADAS STATE FOREST

In May 1931, a fire started back of the ball park. There was a strong north wind and the fire burned a strip south past the old ranch house up Wildcat Canyon and to Conn Valley.

In those days the Division of Forestry was not very well organized, and the ranger, being on only during the six summer months with no paid help, had not been able to organize the volunteer help too strongly. At that, I gathered what students I could secure from Pacific Union College and few volunteers from the St. Helena area and Conn Valley and started a fire line from the Wildcat Canyon road opposite the cemetery knoll and took it on to the William Hess property. That night we took it south past lookout rock into the Overacker property. The next day the wind died down so it was rather easy to mop up the south line, with the volunteer help of the ranchers in that area. This area will be found on the map enclosed, dated May 1931.

Again, on September 8, 1931, a fire started on the Braskee ranch at the head of Big Canyon about four miles northwest of the Pacific Union College; headed with a very strong west wind and very low humidity fire spread in all directions with the main fire headed for Pacific Union College. All available help was gathered from Pacific Union College, Pope Valley, St. Helena Sanitorium and people from the town of St. Helena. No fire trucks were available in those days, nor bulldozers - just good old hard work, strong back and weak mind!

At that time we operated out of Palo Alto, which was the North Coast Headquarters. Mr. Frank Thompson, who was the district ranger, flew to St. Helena and then flew me over the area. I could see that at 7 p.m. the fire had alread crossed the main county road leading to Pope Valley. Landing at St. Helena, I made plans for fire lines. I had split the volunteers into several groups with a leader in charge of each; keeping all Advent people by themselves as they much prefer to be kept that way. Laying out their duties, I started on the front leading from Martin Springs to Redwood Canyon near the Etna Springs. By next morning we had most of the fire line under control, but the big job was to hold volunteers for patrol. That afternoon, September 9, the wind came up strong again and scattered fire east and south of Martin towards Las Posadas. I requested more help from Sacramento, but was told to gather up more local help. At this time I had approximately 300 students and local volunteers on the line, which was approximately 8 miles. I also had a kitchen set-up in the college garage with the ladies of the Legion Auxiliary from St. Helena in charge, making up sandwiches and serving hot meals to those volunteers who were not Advents. The Adventists took charge in serving their people - mashed potato sandwiches and milk. As some of our men were served this food, it soon spread over the whole state that I was serving mashed potato sandwiches and milk on the fire line.

That night after the fire burned about 400 cords of 4' wood which belonged to the College and which was cut and stacked, it was put under control on the Las Posadas and College property line. Sacramento had sent the Napa County game warden in with 15 men to assist. Although these men were picked up out of pool halls, etc., I placed them on the line to patrol under the supervision of Game Warden Johnson. As I had so much to supervise, it kept me busy covering such a large area. As I left this group, I instructed them to take all precaution, especially the next day when the wind was sure to come up again. I got back to this line again about daylight of September 10, and found most of the men asleep. After again warning them of the danger, I saw that all were fed and left for other fronts, which were holding rather good. About 10 a.m. that day I saw a black column of smoke rise in the Las Posadas direction and on arriving found the fire had spotted over into Las Posadas (red crosses shown on map) where several fires had spotted and were burning hot. No men were to be found. On the fire line, as I arrived

in front of the fire, I could see that with some help at this moment I was sure I could save the dense forest below Roosevelt forest and the ball park. When I arrived at Moore Creek where the footbridge crosses to the swimming tank, I found the game warden had left his men early that morning and they had gone down to the the creek to sleep. No effort was made by this group to combat this fire. In fact they complained they were tired from being kept up all night and did not care to fight this fire. Since I had been up day and night on this fire from the day it started, September 8, without sleep or rest, I discharged the entire crew and went to the College and called for more help from St. Helena. A group of merchants and a few good ranch hands responded. By this time the fire had burned well down toward Moore Creek. It was late afternoon and I took the most able men and started back of the ball park where we had the spring burn and ran a line to Moore Creek past the present swimming tank and then up Moore Creek to the top of the ridge. I left the balance of the men on patrol. At daylight I had gained the top of the hill. Traveling back and forth over the boulders in Moore Creek was very dangerous as in those days we had no such thing as flashlights. After daylight, while I was checking on the line and seeing that the men were awake, I came across a stranger to me. After I had spoken a few words to him, he proceeded in a slow manner to introduce himself: "I am Chick Fowler from the Sacramento office they sent me over to see if I could give a hand." He had come in sometime during the night and stayed on patrol on this line. I felt a little better to think that the State of California had not entirely forgotten me - at least they furnished a man.

I pushed the line back to the College property between what is now Roosevelt Forest and the powder house, and tied it into the old fire line of Martin Spring road. That afternoon about 3 p.m. the humidity started to rise, and with a few men I had the entire front patroled and the lines held; but the sight in Las Posadas Forest on the north side of Moore Creek where such a wonderful stand of Douglas fir, oak and madrone stood and no fire scars showed where there had ever been a fire, was very sad looking indeed with nothing standing but a lot of fir and madrone snags - this surely resembled a ghost town. More about this area later.

FIRE CAMP AND CCC CAMP HISTORY OF LAS POSADAS STATE FOREST

In the spring of 1934 the state allotted me a four man fire suppression crew to be stationed at Las Posadas.

A crew of four local boys was hired and a hole was cut in the brush at the entrance gate and a tent set up. This was a dry camp. Water was hauled in a 50-gallon wine barrel, which I had borrowed, on a 1932 Dodge pickup which was used as the fire truck and transportation. Water was hauled from the 4-H Camp.

The crew cooked and ate outdoors. The yellow jackets got so bad that summer that the crew had to wait until after dark to eat their meals.

Even such a small crew as this helped a great deal, especially in patrolling the fire line after it was put under control by the volunteers whom I had organized throughout the county.

About September 1934, word came from Sacramento that a CCC camp from Pine Grove planned to move to lower altitude for the winter months and had chosen Las Posadas for their location and that it was up to the ranger to select the spot and get the grounds ready immediately for they had to have the camp built before the

rains set in. I picked the site and advised Sacramento office of it. In time they sent several officers and Forest Service men to look over the location. They were well pleased and gave me the go-ahead signal in preparing the grounds, hiring 30 local carpenters, some plumbers and electricians.

No money was set up for clearing of the grounds and the Division of Forestry had no equipment. I contacted the supervisors and they loaned me a dozer and pull-grader. Before the grounds were really ready the lumber arrived on the scene and orders were for me to have it checked. This was quite a chore with my four fire fighters. Then to locate the carpenters, etc., was a headache. This all had to be done right now and still we had fires to take care of, but finally I located and had 28 carpenters on the job, some "wood butchers" included. The CCC camp had sent me a few hand-picked boys experienced in this work from their Pine Grove Camp to assist the carpenters, which was a great help. The camp was near enough completion to allow the 200 CCC boys to move in the first of November, before the rains set in. With this additional help the camp was put in A-1 condition in a hurry.

Now came the time to decide what field projects were to be selected for the boys to work on. I sat down with Mr. Earl Branson, Camp Superintendent, and went over the different projects I had thought up. Mr. Branson, being a very level-headed man, made it much easier to work out a plan.

The first thing I had in mind was to try and do some fire prevention work at Las Posadas so that in case of another fire we might be able to save the balance of the area from burning off. The plan was:

1. Cut all burned snags off the burned area on the north side of Moore Creek which were left by the fire in September 1931, and dispose of them.

2. Cut a fire trail around the boundary lines of Las Posadas.

3. Cut and elean up all underbrush along Moore Creek.

4. Cut and clean up all underbrush on the flat on both sides of the CCC camp.

5. Brush and clean up along roadside from Las Posadas to St. Helena and on over to Popé Valley, also from the CCC camp to the 4-H camp.

6. Build a fire road from camp past what is now the powder house and Roosevelt Forest and on down to the ball park.

These were the main projects and in the order they were to be carried out, although as time went on several small projects were added to this list. I hired several local citizens as foremen and everything worked out very well.

After the slope was cleared of burned snags and they were disposed of, the area looked terribly barren so one day when Prof. Woodbridge Metcalf called to see me, I brought his attention to this. It was decided to plant some trees and dedicate the area the "President's Birthday Grove." (Metcalf's suggestion.) I made arrangements with the Sacramento office for trees from the State Nursery at Davis, and a group of CCC boys planted the trees on Roosevelt's birthday in 1934. The trees were Monterey, Coulter and Knobcone pines. The first spring after the planting a flock of goats from the college came through the fence and ate the tops out of the pines. Although most of the trees came back, it did set the growth back some.

The following three years I took upon myself to plant additional trees at odd times. I planted Monterey, Coulter, Leppo, Knob Cone and Yellow pine, and some redwoods. Although there is rather a good stand in this plantation the brush has come back strong and has choked back the growth a great deal, but at that the trees are holding their own. At this writing there are some Montereys 60' tall.

During April 1935, the CCC camp moved back to Pine Grove with the understanding that they would be back in the fall and finish up the balance of the projects and some additional ones which I had been working up.

In May 1935 the State Division of Forestry allotted me a nine-man fire camp to be housed in the CCC camp buildings. These men were drawn from the SERA camp on Noyo River, Mendocino County. I hired Roy Neil as foreman and a local boy named Gene Bell for my truck driver. This gave me a nine-man crew in all.

The state gave me a one-ton express body Chevrolet truck for my crew's transportation - I felt rich!

In the fall of 1935 the CCC camp moved back to Las Posadas camp again with Mr. Hathaway as project superintendent. During the summer months I had worked hard to convince Sacramento that I needed a lookout on Mt. St. Helena and if this was approved a road would have to be built to get lumber and materials for the lookout. Also, I needed communication (telephone) service to Monticello. After much discussion and several trips to Mt. St. Helena, Mr. M. B. Pratt, State Forester, managed to put these two projects over, using all justification that could be secured.

Work for the boys was:

1. Projects that had been approved the previous winter and not completed were to be cleaned up.

2. New road or truck trail to the top of Mt. St. Helena to be surveyed and built (6 miles).

3. Lookout to be built.

4. Telephone line to the lookout from the Calistoga-Middletown trunk line.

5. Telephone from St. Helena to Las Posadas Camp and on to Monticello - 26 miles.

6. 4-H Club swimming tank to be built. This was M. B. Pratt's pet project and he was to see how material could be secured for the project. For several years the 4-H Camp children used Moore Creek to swim in by having it dammed just below the 4-H Camp footbridges. In the winter of 1935 and 1936 during a heavy storm, the dam was washed out, it being of dirt construction. This served as a crossing so had to be repaired in order to get materials to the swimming tank area. A small crew was put to work rebuilding this dam. The swimming pool was completed as the final accomplishment of the CCC crew. The 4-H Leaders named it the Merritt B. Pratt Pool.

It was decided to build a log cabin at the entrance to Las Posadas for use as office headquarters, and to use the burned timber that was cut down for this purpose. The building still stands and is used to house the fire crew. All projects were pretty well cleaned up by spring of 1936 and the CCC camp moved back to Pine Grove once more.

This summer our fire camp was operated by the hiring of some of our local boys and again housed at the CCC camp.

During the winter of 1936-37 a four-man spike camp was loaned me from Willits, Howard Forest CCC Camp to do some work on Mt. St. Helena road wall building. After I completed this work I had a few sacks of cement left so decided to build a sidewalk around the swimming tank at Las Posadas. The winter of 1937-38 Las Posadas CCC Camp was occupied by 250 SRA men, who worked on different projects. One project was to clean up any cut brush that was left by the CCC camp, also to cut some additional firebreaks around the boundary of Las Posadas and some fire protection work within the Las Posadas area as well as outside of this area.

Also a crew was used to build our new headquarters at St. Helena, which we occupied starting the spring of 1938.

Las Posadas CCC Camp was vacated 1939 and all buildings except laundry room and tool house were taken down. Materials were used for the building of different fire camps in the state.

In the spring of 1946 a fire camp was set up for Las Posadas. During the time when there were no fires to fight the crew did fire prevention work around the Las Posadas area.

During the summer of 1950 the fire crew built a new concrete catch basin at the spring. In 1952 the crew built a new pump house at the spring to house the water pump and engine.

During the winter of 1951-52 the fire road leading from the camp to the ball park was rebuilt, with an extension of this road on in to Chiles Valley through the Reeves property. Also, during the fall of 1952 a bridge was built across Maxwell Creek on this road and most of the road was graveled to make it passable the year around.

During the months of February and March of 1953, and at the time this is being written, a new road was built to the spring. Also, the road from the fire camp to the 4-H Camp is being repaired and surfaced so as to make it safer for women drivers.

We do hope to do some work on our firebreaks around the area soon and also build a new garbage disposal dump in Henry Canyon, for the use of the different groups who use the 4-H Camp.

This spring we hope to erect the three new signs - one at the swimming pool, one at the entrance to the 4-H Camp and one at the entrance gate to Las Posadas camp.

The different 4-H groups who use the camp must file an application each year showing that the group will use this area to study trees, birds and wildlife as it was set up to be used by the Blake family.

Las Posadas keeps its gates locked at all times to keep anyone from obtaining a right of way through the property. Any group, or groups, who use the Forest must call for the key at St. Helena fire station and sign for it. No fires are to be built on the property during the fire season months unless a permit is issued to build a small open fire in the 4-H Camp circle during high humidity weather conditions.

SURVEY OF LAS POSADAS STATE FOREST 1931

In March 1931, C. R. Clar, Deputy State Forester of Sacramento called on me in regard to the boundary lines of the Las Posadas property. Not being familiar with this property, it was decided to make a survey of it.

Although at the time I was not on the Division of Forestry pay roll (Napa County was allotted a ranger for only six months of the year - May 1 to November 31), I still was very interested to know the corners and boundary lines of the Forest. We started gathering what information we could from the county records and, also, from land owners on Howell Mt., but very little was learned. We secured some help from Mr. Hjalmar Lundell who at one time had worked on the property for the Blake family.

After tramping over the area we located a section corner on the north section of the south boundary. This was a large live oak tree stump approximately 50" in diameter. Here we planted a steel stake and started our survey of the east boundary, then the south, and so on until we had surveyed the entire property. This became quite a task, for the brush was very tall and thick, and to cut the time down we used a compass and chain tape and Abney hand level and mirrors. At that, it took us three weeks of hard work.

We had to run cross section, such as the LaJota Grant Line to help locate stakes and witness trees. Several were located, especially one which became very interesting. It is located on the south boundary of the LaJota Grant Line, and is a large Madrone tree. After close examination a very slight scar was found and Mr. Clar decided to chop in. Sure enough the witness was located and upon close scrutiny and counting the rings on the tree, it was decided that this was scribed about fifty years back. Mr. Clar cut the scar out and has it in his Sacramento office.

This is what makes surveying so interesting, especially in the Spanish Grant areas, when you can find a witness tree or stake.

LAS POSADAS STATE FOREST

AND 4-H CLUB CAMP

BRIEF HISTORY OF CAMP DEVELOPMENT

NOTES ON EARLY HISTORY
OF LAS POSADAS STATE FOREST

During the early part of 1927 I was informed by Mr. Anson S. Blake of Contra Costa County that Mrs. Blake had a piece of property in Napa County that she wished to give to the University or to the State of California. In this and subsequent conversations with Mr. Blake I gathered that the protection of the property and plans for its use had become quite a burden to Mrs. Blake and that he was anxious to have her relieved of it because of her health.

The property of some 800 acres in the upper watershed of Moore Creek lay adjacent to the Pacific Union College property at Angwin and contained a considerable area of second growth redwood, Douglas fir, ponderosa pine, tanbark and other oaks, madrone and associated species. All of the timber portion of the property had been cut over in the early days by John M. Morris who bought a squatters right to it in 1878 and in 1880 used his homestead and preemption rights to prove up on it. The more level parts of the area had been farmed for years and a small house and large barn were still in usable condition.

The Blakes had built two small summer cottages on the south bank of Moore Creek where they occasionally spent a few days, but leased the "farm" portion of the property to a caretaker named Grayson who lived part time in the old farm house. He was employed in the heating plant at Mare Island Navy Yard.

After discussing the matter with Director B. H. Crocheron it was evident that the University would not be interested in taking title to the property and I therefore suggested to State Forester M. B. Pratt that we meet Mr. & Mrs. Blake at Las Posadas and discuss the possibility of its acquisition by the state as a State Forest.

He agreed and we met the Blakes at their cabin on the property in the summer of 1927 and discussed the transfer of the property as a State Forest and the possible development of a 4-H Club summer camp site for use by five or six Bay area counties. Mrs. Blake had no objection to starting the development of such a camp site during the time negotiations were under way for transfer of the property and Mr. Pratt said he would push the matter with the State Board of Forestry under a law signed by the Governor April 5, 1927.

Mr. Glenn Waterhouse and I visited the property shortly after and arranged for a meeting of Extension Service agents and 4-H Club leaders from Napa, Solano, Sonoma, Marin, Contra Costa and Alameda counties to see if they were interested in going ahead with such development. A group of about 70 people responded to this suggestion and they selected the flat on the south side of Moore Creek for development of the camp. They agreed to raise $100.00 per county and to start development in the spring of 1928.

Farm Advisor Baade and State Ranger Dean were most enthusiastic and helpful all through the early stages of the development, most of which was by volunteer labor.

In 1928 pending the acceptance of the gift by the State, Mrs. Blake executed a 10 year lease of the property to Grayson in which a clause was inserted safeguarding the use of the camp site by the University for 4-H Club camps during the life of the lease.

The following brief excerpts from Annual Reports of the Extension Forester give an insight into the development of the camp and its use. The camp committee was set up early in the game and has continued with slight modifications down to the present. In recent years Mr. Orville Burnside of Sonoma County has been a most effective and diligent chairman of this committee.

Woodbridge Metcalf
Extension Forester

(Excerpts from Annual Reports of Extension Forester)

NOTES ON THE EARLY HISTORY OF LAS POSADAS
STATE FOREST AND THE 4-H CLUB CAMPS

1928

Early in February a group of 70 people from the Bay area counties met at Las Posadas Forest in Napa County to discuss development of permanent facilities for a 4-H Club Camp. They were very favorably impressed with the beautiful timbered canyon and within a few weeks the six county club councils had each agreed to raise $100 towards the expense of such a camp and had appointed a committee to proceed with its development. The Extension Forester worked with this committee in laying out the camp site, clearing underbrush, staking out the site for commissary and running the pipe line for the water system. In all this the wish of Mr. & Mrs. Blake that the natural growth be disturbed as little as possible was carried out.

Actual construction work started on the first of April and continued each week end until the first group went into camp in June. Several people from Napa and Sonoma Counties gave liberally of their time and effort during this period and county agents of several of the counties were on the job practically every Sunday.

A log and sand bag dam in creek.
Screened cook house 16 x 24 built.
Water piped 1400 ft. from spring to cook house and two wash racks with pipe received from East Bay Municipal Utility District.
Four latrines built.

All work done at a cost of $850 plus the contributed labor and each of the counties voted an additional $35 to make up this amount.

All important tree species near the camp were labelled and the Extension Forester conducted each encampment on a hike for tree identification and simple forestry.

1929

Shower bath houses, a water heating system and a hospital and general utility cabin were erected at Las Posadas.

1930

A small amount of improvement work was done at Las Posadas site this year and several successful camps were held. The swimming pool dam in the creek was repaired and the pool deepened. Some grading work was done on the play ground. Ranger Dean has been very cooperative and intended to construct a series of fire breaks and trails this fall. He died suddenly from acute appendicitis.

1931
Three sleeping platforms were constructed at Las Posadas State Forest 4-H Club Camp.

1932
Very little improvement work at any camp site. Camp in Lassen County cancelled because too few members could afford to attend. Additions to sleeping facilities in girls camp at Las Posadas and inexpensive repairs to swimming hole in the creek.

A severe fire swept into Las Posadas Forest from the north and destroyed all of the fine young stand of timber down to Moore Creek. It was only kept out of the camp site and the surrounding timber by strenuous efforts of Ranger Erickson and the fire crew.

1933
Very hard times. Orange County cancelled its 4-H camp. Very little improvement work done at any camp. The burned timber was given to the Pacific Union College for fuel and the trees were cut by crew of students.

1934
Plans have been drawn for improvement of the water supply and swimming pool facilities at Las Posadas 4-H camp during the winter under the E.C.W. program by the Las Posadas CCC camp. They are also doing a great deal of fire prevention, trail construction and other work in the State Forest which will be of value in conducting 4-H Club camps in future years. The plantation was set out in the 1932 burn by the boys of the CCC camp using trees of several conifer species from the State Nursery.

1935
Through the interest and support of State Forester M. B. Pratt a fine concrete s swimming pool and 1300 ft. of intake water pipe were installed at Las Posadas. An access road to the pool site was also built by the CCC to get materials to the site. No improvement work was done during this year by the counties.

1936
Las Posadas State Forest in Napa County is essentially not a recreation site but is maintained as a natural area for the study of forestry and botany and for experiments in tree propagation. However, development of 4-H Club camp grounds for use during a short period in the summer was permitted by the donors and has yielded a large measure of out-door knowledge and enjoyment to club members from Napa, Solano, Marin, Sonoma and Contra Costa counties. The Merritt B. Pratt concrete swimming pool built under the CCC program in the spring of 1935 was brought further towards completion this year. Back filling with earth was completed and repairs to the pipe line were made by a small spike camp crew of CCC workers from Camp Northwestern under the direction of State Ranger Erickson. A small amount of tree planting in the burn was done to extend the plantation set out in 1935. The CCC camp on this property has been standing idle since May 1935 owing to reduction in numbers of the corps which is regrettable as there is a vast amount of fire prevention and improvement work needed in this vicinity.

1937
Las Posadas State Forest is the site of the 4-H Club camp site for the counties of the San Francisco Bay area. No further improvements were added during the year, but some cleanup work at the site and maintenance work on the road was done by some men from the E.R.A. camp which was occupying the CCC camp on the area under the direction of State Ranger Erickson.

1938
Las Posadas 4-H Club camp site at Las Posadas State Forest in Napa County had some clean-up and painting work done on the buildings in advance of the camping season. This was made possible by the caretaker, Bob Wallace, who induced a couple of WPA men to do the work. The paint was some not needed at Whitaker's Forest. After the 4-H Club encampments the University Medical School conducted a very successful camp for diabetic children for two weeks. Acting on an opinion from the Attorney General, the State Board of Forestry confirmed the use of the area by the 4-H Clubs as essentially educational work in conservation.

1939
No comment.

1940
State Forest Ranger Erickson had a small crew of men working at Las Posadas State Forest during the fall and was able to have them build a 4-foot cement sidewalk around the swimming pool at the 4-H Club camp site. This contribution will make it possible to keep the pool in much cleaner condition and will be greatly appreciated.

1941
Very little improvement. The State Forester transferred to the Extension Service two large restaurant-type cooking stoves. One was set up at Las Posadas 4-H Camp and the other at Yuba 4-H Camp.

1942
At our suggestion Ranger Erickson of Napa County planted 125 trees of cork oak at Las Posadas State Forest. Twenty-two additional cork oaks were set out by the writer to test adaptability for interplanting. None of these trees survived.

1943
No comment.

1944
Because of war conditions very little active use or even minimum maintenance work was possible at Las Posadas or other camps.

1945
A minimum amount of upkeep was done at the 4-H Club camp site at Las Posadas Forest in Napa County with the assistance of Ranger Erickson. Each of the six counties contributed $25 to the maintenance fund and the camp was put in reasonably satisfactory shape for the brief period in which it was in use. Army training groups made some use of the facilities during July and may have done a small amount of improvement work.

1946
Two meetings were held for planning improvements at Las Posadas 4-H Camp. The situation at Las Posadas Forest camp in Napa County which has been used by Bay area counties for the past 18 years, is very uncertain because of the restrictive provisions in the deed of gift of this property. These are so rigid as regards recreational use that the State Division of Forestry may return the property to the donors unless they will agree to constructive multiple use in the future. Discussion of the problem is proceeding at the present time and it is planned that a committee of senior 4-H Club members call upon Mr. & Mrs. Blake in the near future to impress them with the need for such relaxation of the requirements so that the clubs can continue to enjoy this attractive camp site.

1947

The development program of Las Posadas 4-H camp has been interfered with by uncertainty about the permanence of lease privileges, but it now appears that the S.F. Bay counties will be permitted to develop and use the site as has been contemplated (and carried on) for nearly twenty years.

TREES OF LAS POSADAS

by

Woodbridge Metcalf
Extension Forester
May 1953

TREE LIST

CONIFERS:

(1) Douglas Fir, Pseudotsuga taxifolia
(2) Coast Redwood, Sequoia sempervirens
(3) Ponderosa Pine, Pinus ponderosa
(4) Digger Pine, Pinus sabiniana
* (5) Deodar Cedar, Cedrus deodara
* (6) Monterey Pine, Pinus radiata
* (7) Knobcone Pine, Pinus attenuata
* (8) Maritime Pine, Pinus pinaster
* (9) Japanese Black Pine, Pinus thunbergii
*(10) Scots Pine, Pinus sylvestris
*(11) Coulter Pine, Pinus coulteri
*(12) Sierra Redwood, Sequoia gigantea

BROADLEAF EVERGREENS:

(13) Coast Live Oak, Quercus agrifolia
(14) Highland or Interior Live Oak, Quercus wislizenii
(15) Canyon Live Oak, Quercus chrysolepis
(16) Tanbark Oak, Lithocarpus densiflora
(17) Madrone, Arbutus menziesii
(18) California Laurel, Umbellularia californica
*(19) English Holly, Ilex aquifolium

DECIDUOUS:

(20) Valley Oak, Quercus lobata
(21) Oregon Oak or Pacific Post Oak, Quercus garreyana
(22) Blue Oak, Quercus douglassii
(23) California Black Oak, Quercus kelloggii
(24) White Alder, Alnus rhombifolia
(25) Fremont Cottonwood, Populus fremontii
(26) Western or California Sycamore, Platanus racemosa
(27) Bigleaf Maple, Acer macrophyllum
(28) Box Elder, Acer negundo macrophyllum
(29) Oregon Ash, Fraxinus oregona
(30) Western or Mountain Dogwood, Cornus nuttallii
(31) California Buckeye, Aesculus californica
(32) Willows, Salix sp.
*(33) Pecan, Carya illinoensis
*(34) Shagbark Hickory, Carya ovata
*(35) Mockernut, Carya tomentosa

* Trees which have been introduced by planting.

TREES OF LAS POSADAS

Las Posadas State Forest and surrounding territory on Howell Mountain, Napa County, are extremely interesting because some trees and shrubs characteristic of the coast, foothills and lower elevations of the Sierra timber belt are all found here. The trees include three of the most important timber species in California (redwood, Douglas fir and Ponderosa pine), while two others (sugar pine and incense cedar) are present not far away on the easterly slope of Mt. St. Helena. There are a number of broadleaf evergreen and deciduous species also so that one can make a good start on learning trees of California by becoming familiar with the species growing at Las Posadas.

CONIFERS

Conifers or cone-bearing trees are also often called evergreens or softwoods because their wood is usually softer and of more even texture than that of hardwoods. The conifers include the most useful and valuable trees from a lumber standpoint.

1. Douglas fir, Pseudotsuga taxifolia, was formerly much more widely distributed at Las Posadas than it is since the fire of 1932. This fire which swept down from the north was put out along Moore Creek above the swimming pool but destroyed a fine stand of young Douglas firs which covered the hills on the Pacific Union College property as well as Las Posadas. Only a few trees survived and some seeding is taking place from these and from large trees on the south or camp side of the creek which were not damaged by the fire.

Douglas fir has a graceful, conical crown as a young tree which makes it our most commonly used Christmas tree. Its needles are dark green, soft to the touch and each is fitted with a little stalk. The twigs are often weeping in habit and the winter buds are dark red in color and quite pointed in shape. The cones are about 2 to 3 inches long and each of the cone scales is fitted with a little leafy bract like a three tined fork which is longer than the scale. The bark on old trees is rough and very dark in color; that of young trees is greenish in color and at intervals it has blisters filled with a clear and pungent "balsam" or resin. Douglas fir is a very popular Christmas tree.

2. The Coast Redwood, Sequoia sempervirens, is one of the most important timber trees of California. It originally occupied more than a million acres of country in a narrow strip from Monterey County to near the Oregon-California line. It is one of the most rapid growing softwood trees in the world and is destined always to be an important resource in coastal counties from Santa Cruz to Del Norte. It makes its best development on bottomlands of sheltered canyons and on bench lands with good soil where it reaches great size and age. The redwoods at Las Posadas are nearly all second growth trees which came up after logging in the pioneer period, but many of the trees have reached large size along Moore Creek. Redwood can be distinguished by its soft, fibrous, red-brown bark, its flat sprays of needles which are dark green above with whitish lines of pores beneath, the tiny globular cones which are usually not more than an inch long, and by its habit of sending up vigorous sprouts in clumps around cut stumps. There are fine trees from camp all along the trail up to the spring, many along the road into camp and smaller ones at the upper end of the fire protection road. This stand of redwoods at Las Posadas is about the most easterly extension of its range.

3. Ponderosa pine, Pinus ponderosa, produces lumber of fine quality and is the most important timber species in the main forest belt of the Sierra Nevada Mountains. It is quite widely distributed in the north coast ranges and the fine young stand along the flat on Howell Mountain is a notable feature of this territory. The tree is recognized by its long needles which occur in bundles of two and three, by its yellow-brown bark broken into "alligator-like" pattern on larger trees, and by the symmetrical cones which are about four inches long. Each cone-scale is armed with a sharp prickle and shelters two small, winged seeds. There are no large ponderosa pines, but plenty of specimens of moderate size from trees near the camp to the almost continuous forest on the ridge along the road all the way to Angwin. Most of the trees at Las Posadas are small or medium sized, so that the bark is dark in color (blackjack stage) previous to assuming the characteristic color and pattern of old trees.

4. Digger pine, Pinus sabiniana, is a tree of the foothill country which has long, slender needles borne three in a bundle and heavy cones of chocolate brown color with stout spurs on the scales. The foliage is gray green in color and tree crowns are often so light as to resemble gray clouds. The bark is heavy and furrowed and often black in color from having been scorched by fire. There are still a few moderate sized specimens in the brush fields to the east of the forest though most of them were killed in the severe fire of 1932.

5. Deodar cedar, Cedrus deodara, from the Himalaya Mts. of India is now one of the conifers most commonly planted as an ornamental throughout coastal and valley districts in California. Its needles are slender, dark green and clustered on dwarf branches, and many of the trees have nodding tips and a gracefully weeping habit of branching. This is the tree that forms the famous Christmas tree avenues of Altadena and Fresno and is widely used as an outdoor Christmas tree in parks and gardens. A small specimen has been planted beside the road across from the swimming pool.

Pines in the Plantation

A number of pines were set out in the President's Birthday Plantation on the upper slope near the north boundary of Las Posadas in the spring of 1934. Relief from competition from the sprout hardwoods has been afforded by work of several 4-H Club camps under supervision of a forester from the State Division of Forestry. Some trees have had to be removed because of severe infestation of the pine gall fungus which forms swellings on the trunk and branches, but many trees have made excellent growth. The following species may be seen here:

6. Monterey pine, Pinus radiata, found naturally along the coast south of San Francisco Bay is a tree of very rapid growth and is the pine most commonly planted along the California coast. It has very dark green foliage of medium length needles in bundles of three and two, dark furrowed bark and cones about five inches long which are borne in whorls in the branches. The outer cone scales are thicker and more heavily rounded than those close to the branch.

7. Knobcone pine, Pinus attenuata, is a tree of the lower slopes found usually in dense stands on poor, often shallow soils both in the coast ranges and interior. Its needles are shorter and somewhat finer than those of Monterey pine and occur three in a cluster. The bark remains smooth for some years and the tree is usually much branches and rather scrubby in habit. Cones of about five to six inches in length are borne in large numbers along the main trunk and branches where they remain in closed condition until opened by the heat of a fire, or sometimes by unusually hot and dry weather. The bud scales have a reddish tinge and young knobcone pines are quite attractive ornamentals for difficult situations.

8. Maritime pine, Pinus pinaster, is native in southern France where it is an important source of turpentine and rosin. It has dark green, stout needles borne in bundles of two, cones about the same size as those of Monterey pine, but more symmetrical in shape, which are often borne in clusters on the branches. From this characteristic the tree is often known as "cluster pine". The bark is dark on larger trunks and has a very decided reddish cast which is quite characteristic of the species. There are only a few of these trees in the plantation.

9. Japanese black pine, Pinus thunbergii, has short stout needles in twos, small and very symmetrical cones which persist for about a year on the twigs after they have opened to shed the seeds, and buds covered with dense, white and feathery bud scales. The bark is rough and almost black from which character comes the common name. Only a few specimens of this species were planted in the grove.

10. Scots pine, Pinus sylvestris. This tree of central and northern Europe has short, twisted needles borne in pairs. They often have a blue-grey color which is quite attractive and gives them increasing popularity as Christmas trees in the middle west where thousands of acres have been planted for this purpose. Older trees of Scots pine may be recognized by the yellow bark of the upper crown and by the small cones with smooth squarish cone scales. A few trees of this species are in the President's Birthday Plantation and so far have not shown infection by the gall fungus. Note: All of the trees of Aleppo pine, Pinus halepensis, from the Mediterranean region in this plantation became so badly infested by this gall furgus that they have been removed and burned.

11. Coulter pine, Pinus coulteri, of the south coast and southern California mountains is also known as "big-cone pine" from the massive size of its fully developed cones. These are similar to those of digger pine, but are yellow brown in color, weigh several pounds when fully grown and are fitted with long curved and very heavy spines. Needles are gray-green in color, are borne in clusters of three and are very long and stout in contrast to the limber and drooping needles of digger pine. The tree grows rapidly and can survive very droughty conditions. Only a few specimens are in the plantation.

12. Sierra Redwood, Sequoia gigantea. This famous relative of the coast redwood is native in the Sierra Nevada at elevations above 4500 ft. It has been widely planted as an ornamental along the Pacific Coast as far north as British Columbia. Its needles are short and sharp pointed and arranged spirally around the stem instead of in flat sprays as in redwood. The cones are much larger than those of redwood.

A number of Sequoias were planted January 30, 1954 on the north side of Moore Creek across from the Blake Cabins, to the west of rows of Monterey pines. These were a gift from Mr. C. L. Peterson of Calistoga to the 4-H Club Camp.

BROADLEAF EVERGREEN

These are trees which though they have broad instead of needle-like leaves, retain many of them throughout the winter season, so that they have some green crown all of the year. Some of the most widespread and typical trees of coastal areas in California belong to this group and many are represented at Las Posadas.

13. Coast live oak, Quercus agrifolia, with its broadly rounded crowns and sturdy branches covered with smooth, gray-green bark is probably the best known tree along the coast from San Diego north to Humboldt County. Its leaves are

dark, glossy green and quite holly-like in shape except that the teeth are smaller and not so sharp. The leaves are usually about 1½ to 2 inches long and the margins are drawn in as with a draw-string so that when the leaf is turned bottom side up, it is about the same size and shape as a teaspoon. The under side of the leaf is slightly lighter green in color than the upper surface and it is smooth, except that usually in the angle between midrib and veins there is a tuft of tiny brownish hairs. The acorns require only one year to mature, are usually about an inch long and show definite bands of color. This tree is very common at Las Posadas.

14. Highland or Interior live oak, Quercus wislizenii, at first glance may appear very similar to the preceding, but the bark is darker and generally furrowed and the leaves are not puckered but generally lie flat and have fewer teeth than do those of coast live oak. The acorns are more slender and pointed than the other and this tree is a resident of foothills all around the great valley up to elevations of about 3500 feet. Its acorns require two growing seasons to mature. The leaves are dark glossy green on both surfaces and do not have the axillary tufts of hairs on the under side.

15. Canyon live oak, Quercus chrysolepis, is sometimes known as "iron oak" or "maul oak" because of the weight, density and strength of its wood. It goes higher into the mountain country than either of the others, being common from 4000 to 6000 feet in the main timber belt. The leaves are either entire or holly-like with few teeth, dark glossy green above and coated with lead-colored hairs on their under sides. New growth usually has a golden tinge as do the acorn cups which are flattened, turban-like and are quite large. From them the tree is also known as "golden-cup oak". The bark is lighter in color than either of the other live oaks, and is typically divided into small vertical ridges. This species is not common at Las Posadas but there is a good specimen on the lower side of the fire protection road about half way to the top of the hill.

16. Tanbark oak, Lithocarpus densiflora, is one of the commonest trees associated with redwood and in a broad belt at the east of the redwood forest areas. It goes into Oregon and appears at intervals at middle elevations in the Sierra forests. Its leaves are larger than any of the three live oaks, are gray-green in color and in shape they resemble chestnut. Leaves, twigs and acorns are covered with dense woolly hairs and its flowers are borne in long, fuzzy spikes which also resemble those of chestnut. The bark is thick, gray-green and smooth, and broken into broad ridges. It is widely used in the tanning of leather. Tanbark oak sprouts vigorously when the tree is cut or burned and you will find many clumps of sprouts coming up on the 1932 burn north of Moore Creek.

17. Madrone, Arbutus menziesii, is one of the most beautiful of the native hardwood trees and a feature of much of the landscape from southern California to British Columbia. It reaches large size and its trunk and limbs are coated with smooth bark which shows patches of tan and red. Its leaves are large and bright shiny green in color; the tiny bell-like flowers are white and borne in dense terminal clusters. The fruits are like-wise in clusters and are small, orange red berries. The wood of madrone is heavy and hard and makes excellent flooring and veneer. It may come into considerable favor as a specialty wood. There are large madrones along the Metcalf trail and much sprout reproduction of this species with tanbark oak on the hills to the north where the forest is recovering from the burn of 1932.

(18) California laurel, Umbellularia californica, belongs to the laurel family and its long, tapering leaves when crushed have the most powerful aromatic odor of any California tree. From this property it is also known as pepperwood and as California bay tree, while in southern Oregon it is called Oregon myrtle where its hard and beautifully figured wood is made into bowls, lamp stands and other attractive turned articles. The flowers appear in late winter or early spring and are yellow green, tiny and borne in clusters. The fruits are olive-like in size and shape with soft, purplish flesh when mature and a single large seed. The tree reaches large size under favorable conditions, but will grow on ridge tops where it stands exposure to severe winds. Bark is dark color and not deeply furrowed. There are numerous small to medium sized trees of laurel at Las Posadas, mostly sprout reporduction after fires.

(19) English holly, Ilex aquifolium, with its dark green glossy leaves armed with sharp marginal prickles and its scarlet berries is known throughout the world as one of the symbols of Christmas. This tree has several varieties of leaf type and many of them do exceedingly well along the Pacific Coast. Portland, Oregon is the center of an extensive holly growing area and the Holman Holly Grove near Watsonville, Calif. has 180 acres planted to this tree. There is a very beautiful specimen at Las Posadas down stream from the swimming pool and across from the ruins of the old Blake summer cottages. It is probably about 40 years old and stands beside the creek.

DECIDUOUS

(20) Valley oak, Quercus lobata, is the largest of the native white oaks reaching massive size and beauty on good soils throughout valley and foothill areas. There are fine specimens in the Napa and Sonoma Valleys, but only trees of moderate size at Las Posadas. Its symmetrical, deeply lobed leaves are without spiny tips and the acorns which ripen in one year are very long and tapered to a point. The bark is broken into a pleasing pattern by deep ridges; the branches are large and sturdy giving the tree a massive appearance with a flattened top and often gracefully weeping outer twigs.

(21) Oregon oak or Pacific post oak, Quercus garreyana, is quite similar to valley oak, but the leaves are generally broader with lobes that appear slightly recurved, and the trunk bark is lighter in color and not so deeply ridged. Its acorns are short and plump instead of being tapered to a point. This species extends from near San Francisco Bay to southern British Columbia and reaches its best development in Oregon valley areas where it is a massive and beautiful tree. There are only moderate sized trees of this species at Las Posadas.

(22) Blue oak, Quercus douglassii, is another white oak of moderate size which is distinguished from the others by its very white and finely striated bark, small, squarish leaves which have shallow lobes and are decidedly blue green in color, and short, chunky acorns which grow from a very thin cup. It is a tree of the foothills and lower slopes all around the great valley and is never very large. Its chief uses are for fuel and fence posts.

(23) California black oak, Quercus kelloggii, is the oak most commonly associated with ponderosa pine, incense cedar and white fir throughout the main timber belt of the Sierras. It also is widely distributed in the coast areas with Douglas fir and its associates. It has the typical broad and deeply lobed leaves with fine spiny tips and acorns which are deeply set in the cut and require two growing seasons to mature. In spring the leaves are densely coated with fine hairs when they unfold and are often a beautiful red color until about

half grown. Later they become smooth and shiny until fall when many often assume red, yellow and russet tones before they fall. The black oaks at Las Posadas are mostly of moderate size with smooth dark greenish bark on branches and a definite pattern of small checks on trunk bark. There is a large volume of black oak available in California and recently some of it has been manufactured into flooring.

(24) White alder, Alnus rhombifolia, is the commonest tree lining the banks of Moore Creek with its smooth, gray-green stems and attractive lacy foliage. It is the common streamside tree in interior and southern California while red alder, A. rubra, occupies the same moist sites along coastal streams from the Bay to British Columbia. The leaves of white alder are only slightly toothed on the margins and quite regularly oval in shape. Flowers are borne in drooping catkins and the fruits are tiny cone-like and bear many winged seeds. Alder wood is used mostly for firewood, but that of red alder is now finding favor for furniture and box manufacture.

(25) Fremont cottonwood, Populus fremontii, is another common tree along streams in valleys and foothills throughout much of California, even into desert areas. Its leaves are broadly triangular or roundish in outline with teeth on the margins which typically are curved forward. Well grown specimens are tall with rounded or flattened crowns, light yellowish green bark on branches and dark furrowed bark on trunks. Flowers are borne in catkins on separate trees in spring and female trees bear great quantities of cottony winged seeds from which this and other poplars get the name "cottonwood". The black cottonwood, P. trichocarpa, of north coast streams is a bigger tree with darker green leaves which are long-pointed in shape and with a definite yellowish color beneath. The wood of both cottonwoods is of rather poor quality for lumber, so is used mainly for fuel. A clump of its near relative, the silver poplar, P. alba, of Europe is beside the road to Angwin in front of the two-story white house. It has very silvery leaves.

(26) Western or California sycamore, Platanus racemosa, is another streamside tree of valley, foothill and semi-desert areas. Its smooth mottled bark with shades of tan and green, broadly lobed leaves which are woolly and with an expanded base to the stem which completely encloses the dome-shaped bud are distinguishing characteristics. Also the multiple fruits which hang in chains of three to four ball-like heads after the leaves fall mark this tree from all others except the hybrid London plane, P. acerifolia, which is so widely used as a street and highway ornamental tree. The sycamores are sometimes called "buttonwood" because of the globular fruit clusters. In recent years the sycamore has been badly defoliated by the sycamore canker disease which caused leaves to dry up and fall off when scarcely half grown, resulting in many dead twigs and branches.

(27) Bigleaf maple, Acer macrophyllum, is the largest and most beautiful of western maples. It is distinguished by its very large and deeply lobed leaves, borne on long stems, its stout green-barked twigs tipped by large dome-shaped buds, and drooping clusters of yellow-green flowers in early spring which develop into broadly winged seeds which occur in pairs of "keys". These seeds are coated with a growth of stiff hairs which pierce the skin and can become quite irritating. Leaf arrangement in the maple is opposite as is the system of branching. Maple wood is occasionally used for furniture and turned articles though less desirable than the sugar maple of the east.

(28) Box elder, Acer negundo californicum, is another opposite leaved tree closely related to the big-leaf maple and widely distributed along streams and in valleys in the central coast area. Its leaves are smaller than the former and are made up of three separate leaflets from which this species is sometimes known as "ash-leaved maple". It is usually a small and somewhat scrubby tree and is probably not represented at Las Posadas by any very large specimens. Its greenish twigs and buds are usually coated by a whitish bloom which is an identifying characteristic as are the drooping clusters of winged "key" fruits in which the keys are smaller and less widely spreading than are those of big-leaf maple.

(29) Oregon ash, Fraxinus oregona, is the largest of western ash trees and occurs along streams or moist flats throughout much of the north coast country. In some places which are poorly drained this tree occurs in dense thickets, but is usually seen as scattered individuals. Its compound leaves of five to seven leaflets are borne opposite each other on stout twigs with brownish, dome-shaped buds and the drooping clusters of fruits are comprised of single-winged seeds which have the shape of tiny canoe paddles. This species is rare at Las Posadas.

(30) Western or Mountain dogwood, Cornus nuttallii, is another opposite leaved small tree which has broadly ovate leaves with entire margins and smooth, gray bark. It is greatly admired for the fine display of large white flowers which occur in spring just before the leaves appear. The flower clusters later develop into multiple fruits of bright orange color. These and the fall coloration of bright red which the leaves assume before they fall make this one of the most decorative of all our native trees. There is one nice specimen of dogwood near the dining platform and others along the road into camp.

(31) California buckeye, Aesculus californica, is one of the more spectacular flowering trees of California valley and foothill areas. It rarely reaches large size but its broadly rounded crown supports great numbers of flower spikes in spring which are crowded with white or cream colored flowers and make the tree look like a great candelabra. The nectar of the flowers is poisonous to bees. The leaves are made up of five broad leaflets joined together at a central point and are opposite in arrangement. The leaves come out early in the spring and fall about mid summer leaving the smooth gray stems and the pendant fruits which contain a large, shiny brown seed about the size of a golf ball.

(32) Willows. Salix sp. Willow trees like cottonwoods and alders are found nearly always growing "with their feet in the water" - along streams banks or the edges of moist meadows. The chief species of central California are designated by color, i.e. yellow willow, red willow and black willow. All have rather long, slender and taper-pointed leaves with a pair of little leafy bracts at the base of each leaf stem, catkin-like flowers which on some species (pussy willows) are very decorative in early spring, and smooth green or yellowish bark on twigs and branches. Bark of the lower trunks is often dark and deeply furrowed. Willows have very light cottony winged seeds which fly long distances in the wind but are able to establish themselves where the soil is moist for most of the year. Weeping willow, Salix babylonica, from the Mediterranean is a favorite ornamental tree for growing on moist lawns and wherever there is sufficient irrigation water during summer months.

Those who lived at Las Posadas ranch set out an orchard of apple and other fruit trees on the gentle slopes down stream from the 4-H camp. Some of the apple trees survive in spite of long neglect and their fruit is relished by the deer.

At the upper edge of this orchard three species of hickories were planted and have developed into very nice trees --

(33) Pecan Hickory, Carya illinoensis. This is the tree which produces the pecan nuts of commerce from selected and improved strains. The bark is dark colored, furrowed and hard. The leaves resemble those of walnut but the leaflets are somewhat sickle-shaped.

(34) Shagbark Hickory, Carya ovata. This tree is recognized by the shaggy plates of bark and by the leaves which have broader leaflets than those of pecan- usually 5. The nuts too, though sweet, are smaller with white, thick, hard and angled shells. In the middle west this tree produces fine lumber which is sought for handles, wheel spokes, baseball bats, etc.

(35) Mockernut Hickory, Carya tomentosa. Another lumber hickory of the eastern hardwood region which does not have shaggy bark. The leaves have 7 to 9 leaflets and are about 7 inches long. The nuts are light brown, globular and somewhat angular.

SHRUBS OF LAS POSADAS

by

Woodbridge Metcalf
Extension Forester
May, 1953

SHRUB LIST

(1) Poison Oak - Rhus diversiloba
(2) The Manzanitas - Arctostaphylos sp.
(3) Blue Blossom - Ceanothus sp.
(4) Toyon or Christmas Berry - Heteromeles arbutifolia
(5) Buckthorn & Cascara - Thamnus sp.
(6) Chamis - Adenostema fasciculatum
(7) Mock Locust - Amorpha californica
(8) Sweet-scented Shrub - Calycanthus occidentalis
(9) Creek Dogwood - Cornus californica
(10) Western Redbud - Cercis occidentalis
(11) Chaparral Pea - Pickeringia montana
(12) California Hazel - Corylus californica
(13) Birchleaf Mahogany - Cercocarpus betuloides
(14) Scrub Oak - Quercus dumosa
(15) Flowering Ash - Fraxinus dipetala
(16) Coyote Brush - Fuzzy Wuzzy - Baccharis pilularis
(17) Choke Cherry - Bitter Cherry - Prunus demissa & emarginata
(18) California Grape - Vitis californica
(19) Western Azalea - Rhododendron occidentale
(20) Rock Spirea - Holodiscus discolor
(21) Red-flowered Currant - Ribes sanguineum
Hillside Gooseberry - Ribes californicum
(22) Snowberry - Symphoricarpos albus
(23) Thimbleberry - Rubus parviflorus
Blackberry - Rubus sp.
(24) Blueberry Elder - Sambucus caerulea
(25) Tree Poppy - Dendromecon rigida
(26) Western Huckleberry - Vaccinium occidentale

SHRUBS OF LAS POSADAS

Shrubs are defined as woody plants which usually develop several stems instead of a single one, and which are usually not more than ten to fifteen feet tall. There are many species and some are broad-leaf evergreen and some deciduous. Many shrubs can grow on more shallow and sterile soil than will trees, and some can survive much drier conditions. Thus several million acres of foothill and mountain country in California is covered with a more or less dense growth of shrubs known under the general term, "chaparral," or just "brush." Many of the shrub species sprout vigorously from the roots when cut or burned and the seeds of some of them are able to withstand the heat of fires that destroy trees and tree seeds. Thus a good deal of country that was formerly covered by a fine stand of timber now supports only a dense stand of shrubs of "brush" which has little economic value, but which occupies the soil so completely that it is virtually impossible for tree seedlings to come back. A good deal of the north and east portions of Las Posadas are in this condition following successive fires. However, some of the shallow and rocky soils probably never supported a growth of valuable timber trees. Some shrubs have value as ornamental plants; a few are useful as forage for wild animals or livestock, and nearly all have utility in holding the soil on slopes against erosion by heavy rains.

The following are some of the more common or conspicuous shrubs of the Las Posadas and surrounding areas:

(1) POISON OAK, Rhus diversiloba, is said to be the most widespread in distribution of any shrub in California and it is perhaps also the greatest nuisance to man because of its irritating oil which causes swelling and blistering of the skin. It occurs very widely throughout California except in very dry areas and at elevations above about 5,000 ft. in mountain country. It is really a sumac, but has a shiny leaf made up of three leaflets each of which resembles the leaf of a live oak. Before the leaves are shed in the fall they often burn a brilliant red color which is so attractive that the unwary often collect the foliage for house decorations to their great discomfort. Poison oak may be a stout shrub or a thin-stemmed vine which clings to tree trunks and may thus reach 50 or more feet above the ground. It often forms dense masses of foliage on the top of old stumps or fence posts, and is thus very similar in habit to the poison ivy of the eastern part of the country. Its flowers are small, greenish white and quite inconspicuous, but the clusters of berries are white and may be rather ornamental.

Most people are somewhat susceptible and many may be badly incapacitated by exposure to this plant, so it is well for all to learn to know it and avoid contact with it as much as possible. Grubbing and spraying with brush-killing solutions have eliminated most of the poison oak from the immediate surroundings of camp, but it is very widely distributed throughout the forest and brush fields, so all should guard against it. After exposure to poison oak it is well to wash the entire body with moderately warm water and good suds of strong laundry soap to remove the irritating oil from the skin. The oil clings to clothing so that this should be carefully washed before being worn again. Swabbing the skin of ankles and wrists with cotton soaked in alcohol will remove the worst of the oil from the skin.

Poinson oak patches may be effectively killed out by spraying the foliage in early summer with the chemicals known as 2,4-D, 2,4,5-T, and Ammate though application the second season to some surviving sprouts may be necessary.

(2) The MANZANITAS, Arctostaphylos sp. The manzanitas are very common chaparral shrubs throughout California. They have broad and generally quite leathery leaves of which some are green and others gray in color, dainty bell-like white or pink flowers in drooping clusters, and fruits which resemble little apples which gives to them their common name. It means little apple in Spanish. Manzanitas are usually from four to ten feet in height, though there are some larger and some dwarf forms. They can usually be recognized by the smooth, dark-red bark on the stout stems. The wood of branches and roots is heavy and hard and makes excellent fuel. There are several manzanitas in the Las Posadas area including Arct. manzanita, Arct. canescens, etc.

(3) The BLUEBLOSSOM, BUCKBRUSH, WHITETHORN, etc., Ceanothus sp. comprise a variety of shrubs which are very common in both foothill and mountain chaparral areas. Some are tiny, prostrate forms which crawl on the ground. Others are tall, widely branched shrubs which reach 20 ft. in height. Some are evergreen; others deciduous. In some the leaves are opposite; in others alternate in arrangement. Some like the deerbrush are excellent forage plants; others are of no value for livestock or wildlife. All have dense clusters of tiny blue or white flowers, somewhat resembling the cultivated lilac and later the ripened capsules contain tiny, round and hard coated seeds which are exceedingly resistant to the heat of fires. Several native forms are very decorative and many fine ornamentals are being developed by hybridization. Wedgeleaf Ceanothus or "Buck-brush" is perhaps the most common shrub in the foothills; Blueblossom often called "tick-brush" is most common in the coast redwood region, Deerbrush is the excellent forage species found at middle elevations in the mountain country while Snowbrush or "Tobacco brush" and others are found at higher elevations. Many of the species have leaves marked by three prominent veins.

(4) TOYON OR CHRISTMAS BERRY, Heteromeles (photinia) arbutifolia, is one of the best known and loved shrubs of California because of its widespread use as Christmas decorations. Its dark evergreen leaves have finely toothed margins; the flowers are small, white and borne in dense clusters in late spring. These ripen in November into bright red berries borne in heavy clusters. These berries are not only sought after for decorations, but are favorite food of robins and other birds. Toyon reproduces well from sprouts and is a feature of the chaparral at lower elevations in the coast mountains and foothill country of the Sierras.

(5) The BUCKTHORNS comprise several shrubs of which the best known are CALIFORNIA COFFEE BERRY, Rhamnus californica, and CASCARA SAGRADA, Rhamnus purshiana. Coffee berry has gray-green leaves and succulent dark brown berries containing a flat-sided seed resembling the coffee bean. Cascara becomes a small tree in the north coast and Oregon hills where its bark is collected to provide the well known cathartic medicine. Its leaves are larger than those of coffee-berry, shiny green, and broadly oval in shape.

Both of these are deciduous shrubs, but there is another called HOLLY LEAVED BUCKTHORN, Rhamnus ilicifolia, in the foothills which has small, evergreen, holly-like leaves and bright red berries which give it a very decorative character. Buckthorn berries constitute the food of several animals and birds.

(6) CHAMISE OR CHAMISO, Adenostema fasciculatum, is typical of the poorest, driest and often steepest slopes in the foothill chaparral country. Its tiny narrow leaves are in clusters and the cream colored flowers are borne in spikes. It is of little value for animal or bird food, but sprouts vigorously after fires which also stimulate growth of seedlings so it covers thousands of acres of burned over country to the exclusion of more valuable plants. There are dense areas of chamise to the north and east of the Las Posadas playfield on the poor, sterile soil which is unfavorable for the growth of most other shrubs and trees.

(7) INDIGOBUSH OR MOCK LOCUST, Amorpha californica, is a small shrub with compound, locust-like foliage having a musty odor. It has dainty flower clusters and some of the species are grown as ornamentals. At Las Posadas it is found sparingly in clusters usually in partial shade of the forest. Another very similar species is common in the mountains of southern California and the southwest, A. fruiticosa.

(8) CALIFORNIA SWEET SHRUB, Calycanthus occidentalis, usually occurs near streams where its large, tapered opposite leaves and attractive dark-red flowers give it a fine ornamental quality. The foliage when crushed has a sweetly pungent odor. It has little value as a grazing plant, and by some is thought to be poisonous.

(9) CREEK DOGWOOD, Cornus californica, is another opposite leaved shrub with tapered leaves, bright red stems and clustered heads of tiny white flowers. It is usually found in clumps along streams or in moist glades with good soil moisture for much of the season. It is not so large nor showy as the tree dogwood found on slopes throughout the forest, but is an attractive streamside shrub. It is browsed by deer and is excellent food for them.

(10) WESTERN REDBUD, Cercis occidentalis, is a favorite ornamental shrub of the chaparral country wherever it occurs. Its heart shaped leaves appear shortly after the purplish-red, pea-like flowers have clothed the dark stems with their spring beauty. These ripen into flat pods which are dark red in color during much of the summer and hang on the shrubs long after the leaves have dropped in the fall; sometimes well through the next growing season. Redbud is the official county flower of Lake County where an annual festival is held during its period of bloom.

(11) CHAPARRAL PEA, Pickeringia montana, is another attractive shrub of the legume family, having small purplish flowers, small evergreen leaves and a much branched, spreading and spiny form. It is not common at Las Posadas.

(12) CALIFORNIA HAZEL, Corylus californica, is usually a large shrub, but occasionally may reach tree size. It is usually found in partial shade in the forest where its beautifully formed, doubly serrate and woolly leaves borne on slender branchlets are an attractive feature of the understory. The flowers appear as long, drooping catkins in early spring before the leaves, and the hazelnuts are borne in a leafy, beaked capsule. These are so eagerly sought after by squirrels that they disappear when they are barely mature.

(13) BIRCHLEAF MAHOGANY, Cercocarpus betuloides, is one of the "mahoganies" which are usually shrub like in form, but occasionally reach tree size. The evergreen foliage consists of small leaves with toothed margins above the middle and tapered to a wedge-shaped base. The flowers are not conspicuous, but the seeds bear a long, silvery, twisted feather-like plume which sticks to the fur of animals and aids in their distribution. These are borne in such large quantities on many of the shrubs that they have a strikingly beautiful soft and silvery appearance. These shrubs are important forage plants for cattle, sheep and deer.

(14) SCRUB OAK, Quercus dumosa, is a common member of the chaparral from Mendocino County to southern California. It is usually a much branched shrub and only occasionally reaches tree size on good soil and in sheltered locations. The leaves are quite variable in size and shape, but the toothed margins give them a holly-like appearance though the color is generally a gray green. The acorns mature in one season and are also variable in size. The evergreen foliage is browsed by deer. It sprouts vigorously after fires and is an important sheep browse.

(15) FLOWERING ASH, Fraxinus dipetala, is similar to other members of the ash genus, having compound leaves in opposite arrangement on the twigs, but its flowers are white, showy and borne in great profusion in early spring. It is found in the chaparral in the inner coast ranges and the Sierra foothills and may not be present at Las Posadas.

(16) COYOTE BRUSH OR FUZZY WUZZY, Baccharis pilularis, is one of the commonest shrubs in coastal areas of central California. Its leaves are small, evergreen and have serrate margins. It blooms profusely in mid summer and the flowers develop into great quantities of cottony-winged seeds which fly long distances in the wind and come up readily on burns and other open areas. It is probably lightly browsed by deer, but has little value as forage for livestock. It is more common near the coast than inland and may be rare at Las Posadas.

(17) WESTERN CHOKE CHERRY, Prunus demissa, and BITTER CHERRY, P. emarginata, are probably present at Las Posadas or in the vicinity. They are thicket forming shrubs rarely becoming small trees with typical smooth cherry bark marked by prominent lenticels, long, oval serrate, deciduous leaves and white flowers which are borne in spikes. The bark is bitter to taste and if too heavily browsed by stock, leads to poisoning.

(18) CALIFORNIA GRAPE, Vitis californica, is generally found climbing over trees and shrubs along streams where it will reach to the top of the tallest trees. The small grapes are eaten by birds.

(19) WESTERN AZALEA, Rhododendron occidentale, is one of our most beautiful flowering shrubs. Its light green leaves are opposite in arrangement, 3 to 5 inches long and have fringed edges. The fragrant flowers are white or pink with a yellow blotch and are borne in clusters. The shrubs become 8 to 10 ft. tall and are usually found in shaded canyons.

(20) ROCK SPIREA, Holodiscus discolor, is a large shrub with alternate toothed or lobed leaves up to 4 inches long which are silvery white beneath. The small creamy white flowers are borne in panicles on drooping branches.

(21) RED FLOWERED CURRANT, Ribes sanguineum,
HILLSIDE GOOSEBERRY, Ribes californicum, and other species of Ribes are found in the north coast ranges and when in full flower are very attractive plants. They have palmately lobed, small and dainty leaves; all of them are quite important browse for deer and cattle and the fruits are eaten by many birds.

(22) SNOWBERRY, Symphoricarpos albus, is an attractive shrub with opposite oval, entire leaves to two inches long which are silky beneath. They may be lobed on young shoots. The flowers are bell-shaped, and light pink in color, borne in clusters. The fruit is a snow-white berry.

(23) THIMBLEBERRY, Rubus parviflorus,
BLACKBERRY, Rubus sp.

These are the familiar thorny vines which form impenetrable thickets in waste places and openings in the forest. The flowers are white and the berries red or black.

(24) BLUEBERRY ELDER, Sambucus caerulea. The light-green compound leaves of this elder are 6 inches long and have 5 to 7 oblong leaflets. The flowers are cream-white in flat-topped heads to 6 inches across. The berries are blue-black with a light bloom. Though usually shrubby, it sometimes becomes a tree to 50 ft.

(25) TREEPOPPY, Dendromecon rigida, is a small shrub with bright green foliage and attractive golden poppy-like flowers. It has a much branched form, evergreen foliage and grows in dry hillsides and road cuts where its bright flowers brighten its surroundings.

(26) WESTERN HUCKLEBERRY, Vaccinium occidentale, and similar species are small evergreen shrubs with dark-green, shiny foliage much used in floral decorations, inconspicuous flowers and blue or red berry fruits which are eaten by many kinds of birds.

FLOWERS OF THE LAS POSADAS CAMP

by

Mrs. Howard Twining
Napa, California
May 1953

FLOWERS OF THE LAS POSADAS CAMP

I have divided the list into sections as follows:

I. Flowers to be found along the Metcalf trail; (under redwoods and in shade, near stream)

a. White or nearly white

Small white nemophila	Nemophila heterophylla
Miner's lettuce	Montia perfoliata
Woodland Star	Lithophragma affinis
Fairy Bells	Disporum hookeri

b. Pink or Rose colored

Wood Rose	Rosa gymnocarpa
Star Flower	Trientalis europea
Collomia	Collomia heterophylla
Climbing pea vine	Lathyrus vestitus

c. Lavender flowers

Pea	Lathyrus torreyi

d. Red flowers

Red larkspur	Delphinium nudicaule
Indian pink	Silene californica

e. Yellow flowers

Gamble Weed	Sanicula menziesii

II. Flowers to be found in Oak woods south of Camp:

a. White flowers

Small white enmophila	Nemophila heterophylla
Common chickweed	Stellaria media
Popcorn flower	Plagiobothrys
White mariposa	Calochortus venustus
Yarrow	Achillea millefolium
Gilia - common	Gilia

b. Pink or pink-lavender flowers

Chinese Houses	Vollinsia bicolor
Shooting Star	Dodecatheon hendersonii
Hedge Nettle	Stachys bullata

c. Lavender flowers

Pea	Lathyrus torreyi

d. Red flowers

Indian pink	Silene californica
Red larkspur	Delphinium nudicaule
Figwort	Scrophularia californica
Indian Warrior	Pedicularis densiflora
Indian Paint Brush	Castilleia poroiplora

e. Blue flowers

Blue-eyed grass	Sisyrinchium bellum
Ground Iris	Iris macrosiphon
Brodiaea. Blue Dicks	Brodiaea capitata
American vetch	Vicia americana
Tall blue lupine	Lupinus
Shorter blue & white lupine	Lupinus bicolor
Hound's Tongue	Cynoglossum grande
Nightshade, Blue Witch	Solanum umbelliferum

f. Yellow flowers

Buttercup	Ranunculus
Bur clover	Medicago hispida
Yellow melilot	Melilotus indica
Lotus	Lotus subpinnatus
Lotus	Lotus micranthus
Yellow pea-flower (like lupine)	Thermopsis macrophylla
Gamble Weed	Sanicula menziesii
Golden Lantern	Calochortus pulchellus
Tarweed	Madia elegans
Sunflower	Wyethia helenioides
Narrow-leaved sunflower	Wyethia angustifolia
Groundsel	Senecio

III. Flowers to be found in open fields:

a. White flowers

Cow parsnip	Heracleum lanatum
Shepherd's needle	Scandix pecten-veneris
Shepherd's purse	Brassica bursa-pastoris
Wild radish	Raphanus sativus
Chickweed	Stellaria media
Bedstraw	Galium
Popcorn flower	Plagiobothrys
White mariposa	Colochortus venustus
Yarrow	Achillea millefolium
Gilia	Gilia
White owl's clover	Orthocarpus
Purple owl's clover	Orthocarpus purpurascens
Everlasting	Gnaphalium palustre
Evening Snow	Linanthus

b. Pink flowers or red flowers

Filaree	Erodium circutarium
Farewell-to-Spring	Godetia amoena
Red maids	Calandrinia caulescens
Scarlet pimpernel	Anagallis arvensis

Geranium	Geranium dissectum
Purple (button) Sanicle	Sanicula bipinnatifida
Pin-Point Clover	Trifolium gracilentum
Clover	Trifolium microdón
Tomcat Clover	Trifolium tridentatum
Clover	Trifolium depauperatum

c. Blue flowers (or predominantly blue)

Blue and white lupine	Lupinus bicolor
Blue buttons	Gilia capitata
Bird's eye gilia	Gilia tricolor
Pale Baby Blue Eyes	Nemophila menziesii var. atomaria
Collinsia	Collinsia sparsiflora
Brodiaea (Blue Dicks)	Brodiaea capitata
Harvest brodiaea	Brodiaea coronaria
Grass nut	Brodiaea laxa
Purple larkspur	Delphinum

d. Yellow flowers

Buttercup	Ranunculus californicus
Footsteps-of-Spring	Sanicula arctopoides
California Poppy	Eschscholtzia californica
Monkey Flower	Mimulus guttatus
Gold Fields	Baeria
Blow-Wives	Achyrachaena mollis
Mullein	Verbascum thapsus
Tarweed	Madia elegans

Most yellow flowers, composites, are summer-flowering, so a summer collection will bring in many more.

FERNS OF LAS POSADAS CAMP

I. Metcalf Trail

Chain Fern Woodwardia	Woodwardia radicans
Wood Fern	Aspidium rigidum
Maidenhair	Adiantum jordani
Polypody. Licorice fern	Polypodium vulgare
Gold-fern (gold-back fern)	Gymnogramme triangularis

II. Open dry rocky slopes

Coffee fern (Sheep fern)	Pellaea andromedaefolia

BIRDS OF THE LAS POSADAS REGION

by

Howard Twining
Napa, California
May 1953

BIRDS OF THE LAS POSADAS REGION

The Las Posadas area is a delightful spot for the bird student. Several sorts of habitats are found here within easy walking distance so there is a wide variety of birds represented. The shaded woods of the pine forests harbor different birds than do the adjacent brushy slopes and one need walk only a few minutes down the canyon to reach open fields and a willow-bordered stream each of which has its own community of birds.

Because of an extended account of birds of this region might be confusing to the beginner, only the commonest birds will be described. As a further help, the birds will be arranged according to the habitat in which they are usually found. The beginner should be warned though that no bird is found strictly in one habitat; their assignments here are meant only as a general guide.

BIRDS OF THE REDWOOD - PINE - FIR FOREST

Western Flycatcher (Empidonax difficilis). In the early morning the explosive "psswit" call of the Western Flycatcher is one of the commonest calls to be heard coming from the shady parts of the dense forest. The bird is of small (warbler) size with brown back, yellowish breast, a white eye ring, and two whitish wing bars.

Solitary Vireo (Vireo solitarius). This is another retiring bird of the deep woods. It would be seldom noticed if it were not for its persistant cheerful song. Some say it sounds like: "Johnny, come here - hurry up!" It is a grey bird of warbler size, with white under parts, white eye ring and line to bill, and white wing bars.

Warbling Vireo. (Vireo gilvus). From the dense trees anywhere along the stream above or below camp headquarters the commonest song to be heard in early summer is that of the warbling vireo. The song bounces up and down in a series of cheery phases at all hours of the day. The plumage is brownish grey; there is a dull white line over the eye but the white eye ring of the solitary vireo is lacking.

Black Throated Grey Warbler (Dendroica nigrescens). A wheezy "zee-ee, zee-ee, zee-ee zee, zip" from high in the tall conifers is usually all one can detect of this warbler unless after much neck craning the bird is seen out on the tip of a spray. On rare occasions the bird may be close enough to show its identifying marks; two white stripes on the cheek contrasting sharply with its black head.

Western Winter Wren (Nannus hiemalis pacificus). From among the dense woodwardia ferns along the stream between camp headquarters and the swimming pool a sudden burst of song that pours out in abandon as though it will never stop. The bird can be identified easily as it slips through the foliage by its extremely short tail and its habit of frequently bobbing.

Olive-sided Flycatcher (Nuttallornis borealia). This flycatcher is a bird of the tree tops. It is usually seen on a dead stub towards the top of one of the highest trees. Its strong call can be heard for half a mile or more. Some think the bird says "Hip, three cheers." Others think it sounds more like "Quit, we're here." It is seldom that the singer comes low enough to show its dark sides separated by a light line down the middle of the breast. Its larger size distinguishes it from the wood pewee.

Yellow Warbler (Dendroica aestiva). Perhaps the loudest of the many calls that come from the deep woods bordering the stream up the Metcalf Trail is that of the Yellow Warbler. It is a descending series of notes sharp and clear in quality. The male is a canary yellow in color, the female greenish yellow.

Pileolated Warbler (Wilsonia pusilla). The pileolated warbler is quite similar to the yellow warbler but has a small area of velvety black on the crown. It is usually found foraging in the lower bushes near a stream. On the Metcalf Trail its song is heard coming from the occasional side canyons that cross the trail. Its song is a series of strong chirps which gradually increase in intensity.

Crested Jay (Cyanocitta stelleri). A glimpse of the solid blue lower back and long blackish crest distinguishes this jay from the California jay. Its call is harsher and has less of the shrillness of the California jay.

Brown Creeper (Certhia familiaris). Another bird that is usually first located by its song is the brown creeper. A thin, very high "screep" from somewhere in the forest will make us aware of a small bird with markings that match the bark of the tree trunk. It creeps slowly up the trunks of trees as it searches for insects hidden in the crevices of the bark. It takes a trained ear not to confuse the note of the creeper with that of the golden crowned kinglet which is also found in the tops of conifers.

Wood Pewee (Myiochanes richardsoni). A song that is mingled with the confusion of notes heard in the spring and early summer in the shady woods is the raspy descending "pee-ee" of the wood Pewee. The singer when located will be found to be sitting more upright on its perch than most birds and occasionally launching forth after an insect. When the bird turns toward the observer one can see the dark sides of the breast divided by a narrow lighter colored line.

Western Tanager (Piranga ludoviciana). It is not easy to understand how a bird as brightly colored as the male tanager can remain so inconspicuous in the evergreen forest. Many campers, if not most, go through the entire session at Las Posadas without seeing one, although there are literally dozens of brilliant birds in the trees above, each one of which would be a rare privilege indeed to see close at hand. The plumage is brilliant yellow with black wings. When the bird is turned toward the observer the crimson head can be seen. The song which is frequently to be heard in the vicinity of camp headquarters sounds a little like a robin but is made up of shorter phrases and is hoarser and lower in pitch. The call is a short "prit-it".

BIRDS OF THE OPEN FIELDS WITH OCCASIONAL OAKS

Lark Sparrow (Chondestes grammacus). This is a large sparrow that can be easily identified by a marked pattern of brown and white stripes on the head, a rounded tail edged with white, and a small dark spot in the middle of the white breast. It has an attractive song full of trills and sweet notes.

Chipping Sparrow (Spizella passerina). From among the oaks of the grassy hillsides a dry extended trill may be heard often from several directions in breeding season. The singer is a tiny sparrow, inconspicuous except for a reddish brown crown.

Junco (Junco hyemalis). These birds are of sparrow size and are distinguished by their black heads and white outer tail feathers. The song is a trill similar to the chipping sparrows but shorter and more musical.

California Jay (Aphelocoma californica). The California Jay is a lighter blue color than the crested jay. It has no crest, is slimmer and has a grey breast so should be easily distinguished from its cousin.

Bush Tit (Psaltriparus minimus). Except during the nesting season, bush tits are found in flocks of twenty or thirty, usually in the oaks on the hillsides. As the birds feed actively they utter quiet twittering notes. They are of about warbler size but have a slightly longer tail. The upper parts are grey the under parts dull whitish.

Western Blue Bird (Sialia mexicana). The head and upper parts of the blue-bird are a deep blue, the throat is blue, and the rest of the under parts are chestnut. The female is much paler.

Red-shafted Flicker (Colaptes cafer). This is a large woodpecker with broad wings and undulating flight. Its white rump may show as it swoops up to alight vertically on a dead branch. A flash of red may show on the wings and if the bird turns toward the observer a black band shows against the grey breast.

BIRDS OF THE BRUSHY SLOPES

Mountain Quail (Oreortyx picta). These are shy denizens of the dense brush seldom seen unless one surprises them by chance. In the spring and early summer the male repeats a single loud call, a resonant, far-reaching "quork". By patient stalking an observer may discover a large quail with a rich reddish brown throat and long straight plume.

Ash Throated Flycatcher (Myiarchus cinerascens). A long rolling "prip" or perhaps "Too-weerp-lookateer" will attract one to this bird. This is a rather lanky bird with bushy head and long reddish brown tail.

Wren-tit (Chamaea fasciata). This bird might be heard a hundred times before it is seen. The song that drifts out from the dense brush of the hillsides repeats the same staccato note finally running the series rapidly together. A diligent watcher tracing down the source might catch glimpses of the bird as it moves about in the tangle and note the small grey body with a very long tail held at a slight angle above the body.

Bewick Wren (Thryomanes bewicki). A clear high song with the burry quality of the wren closing in a very delicate fine trill might attract one to this bird. A rather long bill, long tipped-up tail, and white line over the eye will identify it.

Orange Crowned Warbler (Vermivora celata). In the spring if one were to count the number of bird songs heard in the brush fields this warbler would probably head the list. The song is a faint trill, rising a little in pitch, then falling and fading toward the end. There are no distinctive markings. The upper parts are greenish and the lower parts dull yellow.

Spotted Towhee (Pipilo maculatus). A loud rustle of dry leaves might attract the observer to the spot where a spotted towhee is busily scratching with both feet at once under the dense brush. This is a colorful bird with black head and neck contrasting with a white belly, reddish brown flanks and white spots on the tail.

BIRDS NEAR THE WILLOW-BORDERED STREAM (Meadow Below Camp)

House Wren (Troglodytes Aedon). House wrens nest regularly in the walls of the ruined house by the meadow below camp. They are similar in appearance to the Bewick wren but have no white line over the eye.

Black Phoebe (Sayornis nigricans). A few minutes watching of the black phoebes that are found around the old farm buildings may lead one to a mud nest plastered on the wall of one of the buildings. The phoebe is a large flycatcher which can easily be identified by the black of the head neck and upper parts contrasting with the pure white area of the belly.

Brown Towhee (Pipilo crissalis). This is a stout brown bird with longish tail to be found in tangles of blackberries near the stream. It will be recognized by most as a bird that lives in or close to his own backyard.

Song Sparrow (Melospiza melodia). This familiar song of the song sparrow will disclose the singer - a brown bird with streaked breast with a dark blotch in the middle.

House Finch: Linnet (Carpodacus mexicanus). This bird sings with a rapid joyous succession of notes. The male is bright crimson on head and breast, the female is greyish brown heavily streaked on the under parts.

HOW TO OBSERVE BIRDS

Birds are most active, their plumage is most brilliant and their songs are best in spring and early summer. After the nesting season they become quieter and less conspicuous. Many birds are seen in Central California only during their migrations north and south. Weather conditions and availability of food supplies also influence their habits. They seek food most actively during early morning and twilight hours so are most easily seen at those times. It is difficult to find many birds during the middle of the day - especially in warm, summer weather.

Locating and observing birds requires patience and quiet concentration. A good pair of field glasses is a big help but many species can be seen and identified without them. A bird feeding stand near a window at home will give one an opportunity to study many birds which otherwise might be difficult to see.

Supplementary list of birds which should be found in the Las Posadas area during part of each year:

Turkey Vulture; Buzzard - (Cathartes aura)
Sharp-shinned Hawk - (Accipiter velox)
Cooper Hawk - (Accipiter cooperi)
Red-tailed Hawk - (Buteo borealis)
California Quail - (Lophortyx californica)
Mourning Dove - (Zenaidura macroura)
Allen Humming Bird - (Selasphorus alleni)
Anna Humming Bird - (Calypte anna)
Hairy Woodpecker - (Dryobates villosus)
Downy Woodpecker - (Dryobates pubescens)
Plain Titmouse - (Baelophus inornatus)
Slender-billed Nuthatch - (Sitta carolinensis)
California Thrasher - (Toxostoma redivivum)

Hermit Thrush - (Hylocichla guttata)
Western Robin - (Turdus (Planesticus) migratorius)
Western Gnat catcher - (Polioptila caerulea)
Golden Crowned Kinglet - (Regulus calendula)
Pipit - (Anthus (Rubescens) spinoletta)
Hutton Vireo - (Vireo huttoni)
Cowbird - (Molothrus ater)
Western Meadowlark - (Icterus parisorum)
Black-headed Grosbeak - (Hedymeles (Zamelodia) melanocephalus)
Green-backed Goldfinch - (Spinus (Astragalinus) psaltria)
Lawrence Goldfinch - (Spinus (Astragalinus) lawrencei)

ANIMALS OF THE LAS POSADAS AREA

Mammals Abstracted From

The Mammals of Napa County
by Wm. M. Longhurst

California Fish & Game
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MAMMALS OF THE LAS POSADAS AREA

Black Bear, Ursus americanus altifrontalis
Formerly abundant but probably not present at Las Posadas now.

California Raccoon, Procyon lotor psora
Abundant throughout forest and brushland. In 1939 trapping season 102 were taken in the county. Their dens are usually in hollow trees or holes under rocks.

Ring-tailed Cat, Bassariscus astutus raptor
Distributed throughout Napa County in more heavily forested areas. Probably a number are at Las Posadas. Long tail with rings.

Redwoods Weasel, Mustela frenata munda
Probably at Las Posadas as several were reported west of St. Helena in 1937. A very active and fierce mammal with brown fur and tan under parts.

Spotted Skunk, Spilogale gracilis phenax
Common in forest and brushland throughout the county.

Northern California Striped Skunk, Mephitis mephitis occidentalis
Probably over entire county. Most common where grassland meets forest of chaparral.

Badger, Taxidea taxus neglecta
In southern and eastern parts of the county mostly in grassland and away from forest. Probably not at Las Posadas.

Gray Fox, Urocyon cinereoargenteus townsendi
Found throughout forest and brushland of the county and probably common at Las Posadas. They make their dens among boulders. They are able to climb trees when pursued by dogs.

California Coyote, Canis latrans ochropus
Formerly abundant but now scarce because of poisoning and trapping. They live in mountainous forest and brush land and are probably still present at Las Posadas.

California Mountain Lion, Felis concolor californica
This big cat is found throughout mountainous areas in forest and brushland wherever deer are found. It travels widely and though heavily hunted is probably still present in the Las Posadas area at least occasionally.

California Wildcat, Lynx rufus californicus
Numerous in forest and brushland throughout the county. In 1939 53 were taken in the county. They are probably present at Las Posada.

Douglas Ground Squirrel, Citellus beecheyi douglassi
One of the commonest mammals in California, it persists in grass-land and cultivated areas in spite of poison and traps. Hawks, owls, coyotes and foxes help keep it in check. Probably common in open areas.

Sonoma Chipmunk, Eutamias sonomae
Is found within the range of digger pine, ponderosa pine, Douglas fir and redwood so is undoubtedly present at Las Posadas. It is not abundant anywhere in the county.

Gray Squirrel, Sciurus griseus griseus
This beautiful tree squirrel makes its nests of leaves and twigs in trees and is found throughout forested areas but numbers are subject to great fluctuation - probably because of disease.

Pocket Gopher, Thomomys bottae agricolaris
Wide distribution throughout the county principally in grassland. They make an extensive system of burrows and live on roots of plants. They are important food for hawks, owls, coyotes, foxes and other carnivores.

Kangaroo Rat, Dipodomys heermanni californicus
This rat with very long hind legs is of common occurrence in chaparral areas from Napa Valley eastward and is very abundant at times.

Dusky-footed Wood Rat, Neotoma fuscipes fuscipes
Is common in heavy forest and chaparral areas throughout the county. This one is never abundant and the houses are scattered with few being built in trees. It may be recognized by the squirrel-like tail.

White-footed Mice
Gambel white-footed mouse, Peromyscus maniculatus gambelii
Gilbert white-footed mouse, Peromyscus truei gilberti

These beautiful little mice are grey above and white beneath. They have very large ears from which they are sometimes called deer mice. They are widely distributed in forest and brushland areas. They are very numerous throughout the county.

Long-tailed Harvest Mouse, Reithrodontomys megalotis longicaudus
Throughout the county but usually not common in heavy forest areas.
Not abundant but usually at edges of chaparral and grassland.

Sanhedrin Meadow Mouse, Microtus californicus eximius
Not abundant but probably distributed throughout the county. In the uplands on grassy areas near the edge of forest and brush. During the dry season they congregate near springs but in winter disperse.

House Mouse, Mus musculus
Is found most abundantly near houses and barns and causes a lot of destruction to grain and other stored food products. There are undoubtedly specimens around the camp kitchen.

Black Rat, Rattus rattus rattus
Probably most common in settled areas. May not be at Las Posadas.

Roof Rat, Rattus rattus alexandrinus
Probably present in the county.

Norway Rat, Rattus norvegicus norvegicus
Probably widely distributed, especially around buildings.

California Jack Rabbit, Lepus californicus, californicus

Widely distributed over the county and most common where grassland joins brushland. They feed mostly at night but are often seen in the early morning. They occasionally strip the bark from young fruit trees or vineyards but are not numerous enough to cause much damage.

Brush Rabbit, Sylvilagus bachmani tehamae

This is the little rabbit that is usually seen at the edge of brush patches and along the edges of roads. They are active in the early morning and late evening. They have been collected on Howell Mt.

Black-tailed Deer, Odocoileus hemionus columbianus

This is the common deer of the north coast country and is found widely except in more settled areas; mostly in brushland and forest. They are common at Las Posadas

AMPHIBIANS AND REPTILES OF LAS POSADAS

from

Lab Syllabus (RJ) in Herpetology

by

Robert C. Stebbins
University of California
Berkeley

Part 1 - Newts and Salamanders

California Newt (Triturus torosus)

Its range is from middle Mendocino County, north of San Francisco Bay, south along coast into San Diego County. Adult is 6 to 8 inches; above light chocolate to dark brown, sometimes almost black; below pale yellow to orange. Usually found in vicinity of or within permanent bodies of water such as ponds, streams and reservoirs. Although much time spent on land in moist situations beneath boards, logs, rocks and in rodent burrows, adult must return to water for breeding. Terrestrial individuals often active in daytime, especially during wet weather. Frequently considerable numbers found when seeking breeding ponds. More tolerant of light than most salamanders. Rather awkward when crawling on land but swims with facility by means of lateral undulations of flattened tail with limbs extended posteriorly. When irritated may project head vertically, flatten body, extend legs stiffly laterally, depress eyes, and elevate tail. Food - earthworms, small snails, slugs, sowbugs and larvae and adults of many species of insects.

Eschscholtz's Salamander (Ensatina eschscholtzii)

Its range is from southwestern mainland and Vancouver Island, British Columbia, south in coastal areas to extreme southern San Diego County. Ranges inland in California through the Siskiyou and southern Cascade Mountains southward through the Sierra Nevada and thence into the mountains of southern California. Adult is 3 to 6 inches; tail rounded above, somewhat compressed ventrally, constricted at base; toes 4-5; eyes large and protuberant; 12 costal grooves; coloration highly variable. When soil is damp, found beneath rotting logs, boards, rocks and other surface litter, usually where there is considerable leaf mold. Sometimes found in rodent burrows and buried in damp leaf mold. Trees in habitat are often canyon and coast live oak, black oak, maple, pine, madrone, tan' oak and redwood. Seems to avoid steep slopes much over 45°. Never voluntarily enters water. Spends entire life in damp situations on land. Most often found singly, but adults sometimes found together and subadults and juveniles may occasionally occur in groups of two or rarely more. Usually lies quietly when first exposed but after few moments may lunge forward, crawling with considerable speed. When quiet, tail may be curled. Feeds almost entirely on various kinds of terrestrial arthropods such as small millipedes, sowbugs, spiders, camel crickets, etc.

Slender Salamander (Batrachosepts attenuatus)

Range is coastal regions from southwestern Oregon to northern Lower California; in the Sierra foothills to southern Tulare County, in the Central Valley opposite San Francisco Bay and at Marysville Buttes, Butte County, Calif.; on Santa Cruz and Coronados Islands off the Pacific Coast and on Goat Island in San Francisco Bay. Adults 3 to 5½ inches; ground color dark brown to blackish, often marked dorsally with brownish or reddish-tan longitudinal band which may possess herring bone markings; dorsal band sometimes obscure centrally or represented by lichen-like flecks and mottlings of buff to rusty brown; rusty spot usually present centrally on upper surface of neck; below sooty; iris dark brown, usually with flecks of brassy. Occurs in moist situations on ground in leaf mold and beneath surface objects of all sorts. In dry weather goes under ground, probably employing burrows of other animals such as those of earthworms, arthropods, rodents, etc. or by using old root channels, or other cavities since incapable of digging into firm soil. Often found curled in tight coil. Frequently several individuals are present beneath same object.

Crawls by using diminutive limbs in conjunction with lateral undulations of body. When picked up, may move very quickly andhaphazardly by lashing body from side to side in violent contortions. Food - earthworms, small beetles, beetle larvae and small sowbugs.

Black Salamander (Aneides flavipunctatus)

Range from the Klamath Mountains in California south along coast to southern Santa Cruz County. Adults 4 to 6 inches; costal grooves usually 14. Occur in rocky situations along streams and in talus where seepages occur. Colony of heavily spotted animals was found near Lucerne, Lake County, Calif. beneath talus, 100 feet back in damp mine shaft. Food - spiders and beetles.

Arboreal Salamander (Aneides lugubris)

Range is principally in coastal mountains of California from Humboldt County to San Diego; also in the foothills of the Sierra from Calaveras to Madera counties. Adult around 4-6 inches; head broad, triangular, widened and deepened behind eyes due to large jaw muscles; eyes strongly protuberant; tail slender, somewaht prehensile; costal grooves usually 15, rarely 14 or 16; tips of toes of appressed limbs meet or overlap usually up to 1 intercostal fold; toes with enlarged tips; above dark brown with whitish to yellow spots varying in size and abundant; below whitish with numerous minute stipple marks which in some individuals may give a grayish cast, depending in part on location of pigment of melanphores; underside of tail and feet buff colored; iris with variable number of flecks of silver to pale yellow on dark brown ground color. Frequents both trees and ground. Has been found in cavities principally in coast live oaks to a height of 30 feet. As many as 35 individuals have been found in a single chamber during summer months. Occurs beneath rocks, boards, logs and other surface objects. Also has been discovered inside decayed logs and stumps, in mine shafts, damp cellars, rodent burrows and in wood rat and red tree mouse nests. They are active, agile climbers; expanded digits and prehensile tail arboreal adaptations. May utter squeaking sound when disturbed. Breathes as other plethodonts but also has large blood sinuses at tips of toes which probably make possible considerable respiration through digits as animal climbs about over damp tree surfaces or ground. May feed to large extent upon soft wood and fungus. Also eats slender salamanders and insects such as beetles and ants.

Part 2 - Toads and Frogs

Western Toad (Bufo boreas)

The range is from southeastern Alaska through British Columbia, Washington, Oregon, California, into northern Lower California. Adult is 2½ to 5 inches; numerous pitted warts on dorsum; general coloration grayish dusky brown or dull greenish; whitish vertebral stripes present, sometimes broken; warts light colored, usually brownish, set in black blotches which may unite; tendency toward dark banding on limbs. Occupies diverse habitats from sea level to high mountains; in relatively dry to quite humid situations. Found in open valleys and meadows, about lakes and streams, and less commonly in heavily wooded regions. Seeks shelter in daytime beneath boards, logs, rocks and other surface objects or in recent burrows. Individual toads known to return

regularly to selected retreats, exhibiting pronounced homing behavior. May hop in moving about but larger-bodied individuals usually prefer to walk. Gait awkward, not rapid; hind toes dragged, as indicated by tracks. When swimming, forelimbs appressed to sides or extended anteriorly, propulsion by means of hind limbs. Voice weak. During nuptial activity or when handled, may utter bird-like chirping sound, also capable of grating croak. Eggs black enclosed in tubular sheath of clear jelly arranged in 2 or 3 parallel rows. Over 10,000 eggs have been laid by a single female.

Pacific Tree Toad (Hyla regilla)

Range from British Columbia, south through Washington, Oregon, California. Adult is usually under 2 inches; hind toes webbed; skin smooth or with few inconspicuous tubercles; general color highly variable - green, various shades of brown, light gray, to almost black. Capable of marked color change; below unspotted whitish or pale yellow, yellow color becoming more pronounced posteriorly, especially on concealed surfaces of limbs. Seeks cover in variety of places such as rock fissures, vegetation along streams, rodent and other burrows, nooks, springs, streams, irrigation canals and other bodies of water, but has been found as far as one-half mile from water. Behavior is largely nocturnal but active also in daytime. Not especially attracted to trees; usually found on or near ground. Voice well developed in male. Volume of voice all out of proportion to size of toad. Food - damsel flies, leaf hoppers, cockroaches, bettles, small flies, spiders, etc.

Red-Legged Frog (Rana aurora)

Range from southwestern British Columbia southward through Washington, Oregon and California into northern Lower California. Adult to somewhat over 5 inches; skin smooth or rough; above brownish to olive with dusky spots, often with fuzzy outline; limbs blotched and cross-barred with blackish; below light colored, mottled; capable of considerable color change from dark to light phase. Frequents permanent bodies of relatively quiet water such as ponds, pools along streams, reservoirs, springs, lakes and marshes. Highly aquatic. Voice a gurgling tremulous sound. Usually exceedingly wary.

Yellow-Legged Frog (Rana boylei)

Range from coastal areas of Oregon southward throughout California to San Diego County. Adult around 2-2$\frac{1}{2}$ inches, usually under 3$\frac{1}{2}$ inches. Skin roughened in varying degrees by numerous minute tubercles; above variable in ground color - blackish, reddish brown, gray, olivaceous, or greenish with varying amounts of intensity of dusky spotting and mottling - some individuals quite uniform in body color; most with light patch in front of dark area on upper eyelid; below whitish, grading to yellow on posterior part of body and hind limbs. Frequents streams. Nearly always found within few feet of water. Creeks with rocky courses appear to be favored. Seeks moving but not swiftly flowing water. Often active in daytime. May be found sunning on bank of stream. When frightened, seeks seclusion beneath stones or in sediment of stream bottom. Food - aquatic and terrestrial arthropods, particularly insects. Eggs in grape-like clusters in water usually 5 inches or less deep, attached to stones. Egg with three jelly envelopes.

Part 3 - Lizards

Western Fence Lizard (Sceloporus occidentalis)
(Blue-bellied Lizard)

Adult about $2\frac{1}{2}$ to $3\frac{1}{2}$ inches (snout to vent). Tail somewhat longer than head-body measurement. Scales smaller beneath; no reddish-orange on sides of body. Color above brown or olivaceous; some individuals almost black. Color beneath whitish, yellowish, blotched blue patches beneath. Frequents wood piles, old buildings, wood rat nests, banks with gopher and other burrows. Prefers wooded or rocky canyon and stream beds. Is a good climber. Changes color easily. Male fights vigorously in defense of favored location against trespass of rivals. Bobbing and flashing of abdominal blue patches by laterally flattening of body. Food - insects of several kinds. Eggs are laid in loose, moist earth. There are several closely related subspecies.

Small Scaled Swift (Sceloporus graciosus)

Resembles the fence lizard but smaller. Sides often with orange color. Some blue areas beneath. Observed about stumps, logs and rock piles, often in sparsely wooded regions. Primarily lives on the ground but may climb in bushes and when frightened occasionally may climb trees 12 to 15 ft. Bobbing habit as with many lizards. Body rhythmically and stiffly raised and lowered by bending and straightening the forelimbs. Food - insects and arthropods.

Western Skink (Eumeces skiltonianus)

Adults $2\frac{1}{2}$ to 3 inches in snout-vent length; tail about $1\frac{1}{2}$ times head-body measurement. Scales in not more than 28 rows around width of body. Above brown with two light lines passing back from upper eyelids onto body, fading out at base of tail. Tail usually uniformly colored toward tip. Belly pale blue; sometimes bluish tinge on throat. Occurs beneath decayed logs, bark, in leaf litter, beneath stones, and other surface objects. Found in woodland, forests and grassland. Food - principally insects. Eggs are spherical, blackish-brown in color and with soft flexible shells. Laid on ground in shade of rocks, etc.

Northern Alligator Lizard (Gerrhonotus coeruleus)

Average adult size about 5-2/5 inches in snout-vent length. Tail less than two times the head-body measurement. Eye with dark pigment. Dark markings irregular in spots or blotches not sufficiently distinct to make counting in series possible. Above with glazed appearance and olive, greenish or bluish suffusion. Male often with broad more triangular head than female. Usually in vicinity of coniferous forests. Found under logs and other objects where bushes, trees and open grassy areas afford forage and cover. Food - insects, spiders, grasshoppers, snails. Female lays from 2 to 15 eggs usually in September which are retained in the body until young are fully formed. They are encased in thin transparent membrane from which they soon escape.

Foothill Alligator Lizard (Gerrhonotus multicarinatus)

Adults $4\frac{1}{2}$ to $6\frac{1}{2}$ inches in snout-vent length. Tail slightly over two times head-body length. Above dull yellow or brownish colored. Lower surface with dark longitudinal markings on middle of scale rows. Inhabits oak and chaparral belt in foothills and valleys. Found in woodpiles, brush heaps, and shady

thickets. Fond of cover. Good climber and swims well. Body moves in sinuous curves when crawling rapidly forward. When not alarmed slow and deliberate. May play "possum" when caught in open away from cover. An aggressive species; may attack animals much larger than self when cornered. When picked up writhes and emits ill smelling excrement. Food - beetles, crickets, termites, spiders, scorpions, snails, bird eggs andyoung, and possibly small mammals. Several subspecies.

Part 4 - Snakes

Rubber Snake (Charina bottae)
(Also called Ball or Two-headed Snake)

Wide range in California. Adults around 18 inches in length with tail short and almost as blunt as head. Enlarged scales on top of head. Color tan to dark brown, frequently with yellowish, greenish or bluish tinge without pattern. Below yellow to yellowish white. Usually found in moist localities, often in coniferous woods, near streams, under rocks, bark or in rotting wood. Usually move about at night. They burrow in loose soil and are good climbers. Food - small mammals and lizards which are killed by squeezing as this snake is a constrictor. Several subspecies.

Western Ring-necked Snake (Diadophis amabilis)

Wide range in California. Adults may be 12 to 18 inches long and olive, brownish, greenish, bluish slate or gray color above and darker on head. Distinct white or yellowish neck ring, below brilliant orange or coral red, brightest on tail. Belly spotted with small black dots. Usually found beneath boards, logs and rocks, often in moist localities with good vegetation. Behavior - Secretive. When irritated, usually coils tip of tail into tight "thimble-like" spiral, revealing red coloration of ventral surface. Food - tree frogs, small larvae, salamanders, lizards, worms and possible insects. Several subspecies.

Racer and Whipsnake (Genus Coluber)

Body long and slender; head elongate and distinct from the neck; eyes large. Scales smooth - in less than 19 rows. Alert, active and swift moving snakes. Head and neck usually held well above the ground when crawling. Most are good climbers. They do not employ constriction in killing their prey but usually subdue it by pressing against ground with loop of the body.

Racer - Coluber constrictor. Adult under 4 ft. long usually $2\frac{1}{2}$ to 3 ft. No pattern; color olivaceous to bluish; below unmarked, light colored. Young ones marked with dark dorsal patches. Is somewhat larger than the smooth green snake. Prefers moist areas. Occurs in open country in fields, along streams with grassy margins, in mountain meadows, and in thin brush along edges of prairie land. A good climber and is a graceful, gentle snake. Food - amphibians including tree frogs, crickets, rodents and birds; possibly lizards and insect larvae. Females lay about 16 eggs sometimes in decaying vegetation. Eggs about 2 inches in length with granular surface. The young are 8-12 inches on hatching.

The variety Coluber masticophis lateralis is known as the California striped whipsnake. It has a single light lateral stripe extending to the tail.

Gopher Snake (Pituophis catenifer)
(Pacific Bull Snake)

Adults 4½ to 6 ft. or more in length. Above pale brown, yellowish white, or whitish with pattern of squarish black, brown or grayish blotches along middle of back, separated by light colored interspaces; ground color of sides broken by checker-board pattern of small blotches; below whitish or yellowish. Occurs in wide variety of places from lowlands to mountains, cultivated fields and grass lands. Is abroad both day and night except in hot weather. Food - rodents of various kinds, rats, mice, gophers and ground squirrels; also small birds. Kills by constriction. A useful snake in keeping down rodent population. Eggs are probably laid in late July or August. Several subspecies.

Common King Snake (Lampropeltis getulus)
(Chain Snake)

Widely distributed in the west. Adults 2½ to 3 ft., occasionally to 5 ft. Reddish brown, chocolate brown or black with white or straw colored rings with or without brown pigment. Widely distributed but not in high mountains. Common in chaparral areas. Frequently in cultivated areas where rodent prey is abundant. Food - snakes are important in diet. Whipsnakes, bull snakes and rattlesnakes among those taken. Occasionally will swallow a snake longer than itself. Other food includes lizards, birds and their eggs, and rodents such as mice and gophers. Females lay 6 to 9 eggs per clutch in June to August. Hatchlings are about 10 inches and emerge from late August to September.

Mountain King Snake (Lampropeltis multicincta)
(Also called Coral King Snake)

Widely distributed in mountains throughout the west. Adults are 2 to 3 ft. in length; body brightly banded with red, white and black. The red markings are always bounded on either side with black. White rings usually more than 30; snout black. Note! The poisonous coral snake is not found in the north coast area. In it the wide red bands are bordered on either side with yellow instead of black. The harmless Mountain King Snake frequents coniferous forests and prefers moist, cooler portions. Food - lizards, possible snakes and small rodents including mice.

Sharp-tailed Snake (Contia tenuis)

Wide range from Puget Sound to C. central California. Adults are 10 to 11 inches long with smooth scales. This is a rather stout snake with a short conical tail ending in a sharply pointed scale. Color above, brown, reddish or yellowish brown or grayish, sometimes weakly spotted with slaty or black; usually with light yellowish, brownish, orange or reddish line along each side, bordered below by a row of black dots which in a very young individuals form a continuous black line. Upper surface of tail sometimes suffused with red. Ventral plates white to pale yellowish with sharply defined black anterior borders. Usually found beneath boards, stones, logs, etc. in relatively damp situations, often not far from creek or stream. Has been found in numbers in digger pine, blue oak, manzanita, chamise association, beneath logs with moisture as indicated by presence of slugs, earthworms, and millipedes. Behavior - probably largely nocturnal or in dim light. Secretive. Foods - slugs and earthworms.

GARTER SNAKES

Western Garter Snake (Thamnophis elegans)
Pacific Coast Garter Snake (Thamnophis elegans terrestris)
(Also Single-striped Garter Snake)
Common Garter Snake (Thamnophis sirtalis)

The garter snakes are usually 2 to 3 ft. in length; the males smaller than females. Ground color of the body black, gray or brown with yellow dorsal stripe and lateral stripes of yellow or red. Found in meadows with tall grass or clearings. Prefers moist localities usually near water but not in it. Food - small fish, slugs, earthworms, fish eggs, salamanders, small frogs, toads, tadpoles, lizards, snakes, birds and small mammals. Garter snakes are widely distributed and one of the best known small snakes. They are pugnacious when picked up and excrete a strong smelling white fluid from scent glands to aid in escape.

Western Rattlesnake (Crotalus viridis) - subspecies oreganus

The rattlesnakes in a number of subspecies are widely distributed from Canada to Mexico and from sea-level to timber line or above in the mountains. They are poisonous and distinguished by the diamond shaped markings, flattened head and jointed horny rattles on the tail. The coast form is generally darker in color and may be almost black above. This subspecies (oreganus) is found in grassland, chaparral and forested areas. It stands more cold than other rattlesnakes. Food - principally small rodents as ground squirrels, meadow mice, gophers, chipmunks and occasionally lizards.

This is the only snake in the Las Posadas area that is poisonous.

Part 5 - Turtles

Pacific Mud Turtle (Clemmys marmorata)
(Western Pond Turtle)

Adults are sometimes over 7 inches long. Prefers quiet water of ponds or pools in sluggish streams. Thoroughly aquatic but comes out of water to bask on logs or rocks along shore. Quickly drops in water when disturbed. Female lays 5 to 11 eggs in sunny place along stream or some distance from water in open field or on hillside.

FISHES OF MOORE CREEK
LAS POSADAS AREA

from

Syllabus ZF Part II
Fisheries Management Lab. Syllabus
Zoology 116

by

P. R. Needham, Prof. of Zoology
University of California
Berkeley

FISHES OF MOORE CREEK
LAS POSADAS AREA

Rainbow and Steelhead Trout (Salmo gairdneri)

Those rainbow trout living in a river system open to the ocean usually migrate downstream when two years old and enter the ocean for a feeding and growing period of two years, after which time they will make a return migration up coastal streams for spawning purposes. Rainbow trout which perform this migration to and from the ocean are called "steelhead" or "steelhead trout." In other words, a steelhead trout is merely a rainbow trout that has lived in the ocean and returned to spawn in fresh water. The fish which remain in fresh water are smaller in size and not so "steel-like" or silvery in appearance.

Their native range is from southern California into Alaska. This is the trout that is propagated so extensively in state fish hatcheries. Its fame as a game fish has spread far beyond its native range. About 3 million pounds of steelhead are caught commercially every year on the Pacific Coast.

Rainbows and steelhead trout have mouths white inside; salmon have quite black mouths.

Sacramento Sucker (Catostomus occidentalis)

This fish has a ventral mouth with thick lips covered with small, fleshy feelers.

Its distribution is widely spread throughout the streams and lakes of the Sacramento-San Joaquin River Basin, in the Russian River Basin, and in streams entering San Francisco Bay; a native fish of California. It is of very slight commercial value being sold largely by the Chinese. The flesh is too bony for most Americans.

Sacramento Squawfish or Sacramento Pike (Ptychocheilus grandis)

This fish has a large, pike-like mouth with teeth set far apart. The young have a spot at base of caudal fin.

It is a native of California only; it is found in the Sacramento-San Joaquin drainage, the Russian River and the Pajaro River systems. Its habitat is typically that of a slow, warm lowland or foothill stream having frequent pools. It is one of our large western minnows. When these fish are overly abundant they present serious competition with more desirable species of fish. They compete with trout for "living space" and food.

Hardhead (Mylopharondon conocephalus)

This fish has a large mouth with thick lips, a depressed head and small eye.

It is native of California only, being found in the Sacramento-San Joaquin river systems. It attains a large size for a minnow, up to 2-3 feet in length, and next to a species of Ptychocheilus found in the Colorado River, is the largest of the native American cyprinidae.

Prickly Sculpin (Cottus asper)

The color of this fish is grayish olive mottled with black; the skin is rough to the touch; an its size is about 5 inches.

It is found in coastal streams from Alaska to Ventura County; found in fresh and brackish waters. These are eaten to some extent by large trout in the coastal streams and are used as bait by anglers fishing for steelhead. They are frequently found in enormous numbers.

Slim Sculpin (Cottus aleuticus)

Description similar to the preceeding. Skin is smooth but may be prickly beneath. The head and body are mottled or spotted above, uniformly light brown ground color; the dark markings are often arranged in six cross bars.

These fish are found from Unalaska to Monterey, California and are common to coastal streams and occasionally in brackish waters. Very little is known about the habits of these fish. They are used as bait to some extent.

Three-spined Stickleback (Gasterosteus aculeatus)

The color of these fish is variable depending on their particular habitat, being silvery green to bluish black in marine specimens and mottled brown in fresh water specimens. Their length is rarely more than three inches. The first dorsal fin has 2 or 3 serrated spines which can be locked in a position vertical to the body.

These fish are found from southern California to northwest Alaska in marine, brackish and fresh waters. They feed on small crustacea and water insects. They are found in almost any place a fish can live from fresh water to a depth of 90 ft. in the ocean.

SOME FOREST INSECTS OF THE

LAS POSADAS REGION

(This list of insects was suggested by Mr. Paul Keen of the Division of Forest Insect Investigations and descriptions were adapted from his "Insect Enemies of Western Forests.")

SOME FOREST INSECTS OF THE LAS POSADAS REGION

This list of tree insects was suggested by Mr. Paul Keen of the Division of Forest Insect Investigations and the descriptions are adapted from his "Insect Enemies of Western Forests" - U.S.D.A. Miscellaneous Publication 273, Revised July 1952.

Enemies of the Pines

Pine Bark Beetles

No group of commercially valuable trees in western forests has more insect enemies than the pines, and of these, bark beetles are the most numerous and destructive. The most aggressive bark beetles attacking western pines are the so-called pine beetles, which belong to the genus Dendroctonus. Several species in this group are capable of attacking and killing normal healthy trees. The damage they do in western pine forests runs into millions of dollars annually.

The next most important group comprises the pine engraver beetles belonging to Ips, Pityogenes, and related genera. These beetles usually work under thinner bark and make very striking and distinctive forked or star-shaped gallery patterns. While they normally breed in weakened, dying, or felled trees, or in broken branches and slash, and are to that extent beneficial in hastening the disintegration of forest debris, they occasionally develop in sufficient numbers to become primary enemies of young trees and of the tops of older ones.

There is also a third group of bark beetles comprising a large number of species that are secondary in their attack and are seldom responsible for the death of any trees. Many of these are found feeding under the dying bark of pines that are being killed by other bark beetles, fire, or other causes, and sometimes are confused with primary species. Space will not be taken for a description of all the bark beetles that may be encountered, for it is usually sufficient for all practical purposes if the forester learns to recognize species of chief importance.

Dendroctonus Beetles

The pine beetles that are members of the genus Dendroctonus (meaning tree killers) make up by far the most destructive group of bark beetles attacking pine trees in North America. All species breed under the thick bark of the trunk of living or dying trees or in fresh stumps or logs of various pines. Some species prefer felled, weak, or dying pines, whereas others apparently prefer normal, healthy pines for their attack.

The adults are stout, cylindrical, dark, reddish-brown to black bark beetles ranging from 1/8 to about 3/8 inch long. The eggs, larvae, and pupae are similar to those of other bark beetles. These beetles are monogamous in habit and each pair constructs a single egg gallery which, starting from the outside, penetrates to the cambium and is extended between the bark and wood. Egg galleries differ in that some wind in a tortuous manner, crossing and recrossing the galleries made by other pairs of beetles, while others are straight and parallel to the grain of the wood. Dendroctonus egg galleries are always packed with boring dust, except

for an inch or two at the end where the beetles are working. This will distinguish the work of the Dendroctonus beetles from that of other groups of bark beetles.

Trees attacked by Dendroctonus beetles can first be distinguished by reddish boring dust caught in bark flakes or crevices and around the base of the tree, or by pitch tubes that form on the bark at the mouth of the entrance tunnels, but in heavily attacked or decadent trees pitch tubes are often either missing or so small that they can be seen only from a short distance. Later, discoloration of the foliage furnishes a more noticeable evidence of attack. It is difficult, however, to correlate accurately the discoloration with the status of brood development, as this varies with different tree species, regions, and seasons. The most conclusive evidences of attack are the egg and larval galleries on the inner surface of the bark. These form a pattern so characteristic for the work of each species that, when considered with locality and host tree, the identification of the species responsible for the attack is relatively simple.

Western Pine Beetle

The Western Pine Beetle (Dendroctonus brevicomis Lec.) is the most important insect enemy of ponderosa and Coulter pine within the range of these trees from Baja California north into Oregon, Washington, Idaho, Montana, and western Canada. Other pines may be attacked under exceptional conditions. Normally this beetle breeds in a few overmature trees, in windfalls, unhealthy trees, or in trees weakened by drought, stand stagnation, or fires. Under epidemic conditions it becomes aggressive and kills apparently vigorous trees of all age classes having bark sufficiently thick to protect the insect in its development. Trees under 6 inches in diameter are seldom attacked, nor does this beetle breed in limbs. The heaviest losses of mature merchantable ponderosa pine have resulted from outbreaks of this insect in California, Oregon, and Washington. It is less important in the more northern limits of its range. Losses as high as 50 per cent of the timber in 5 years have been recorded, and many large blocks of pine timber have been commercially ruined by its depredations.

The adult beetles are about the smallest of the western species of Dendroctonus and measure from 1/8 to about 1/5 inch long. The larvae found in the outer bark are white, curved, and about the size of a grain of rice. Their work is distinguished from that of other bark beetles within the same range by the winding egg galleries which cross and recross each other, forming a network of irregular markings on the inner surface of the bark and on the surface of the sapwood. The larvae feed in the inner bark, working away from the egg gallery for about half an inch and then into the outer bark, where they complete their development. Flight and attacks start late in the spring or early in the summer and continue until stopped by cold weather. There are from one to two generations annually in the northern part of range and from two and one-half to four generations in the southern portion, where activity continues almost without interruption throughout the year.

Woodpeckers, clerid beetles, and ostomatid beetles are important natural enemies of this insect, though its abundance is more often determined by climatic influences and the resistance of the host tree. Prolonged winter temperatures of -20° F. and lower have been found to cause heavy brood mortality. Rapid, vigorous tree growth increases host resistance and discourages epidemics.

This bark beetle has been most successfully controlled through sanitation-salvage logging, by which high-risk trees are removed from the stand and utilized for lumber, thus depriving the beetles of susceptible host material. Direct control may be recommended, particularly for parks and recreational areas, when epidemics appear to be developing, and for maintenance control. Direct control measures consist in felling the infested trees, peeling, and burning the bark late

in the fall, or in winter or early spring. Such control work has been successful in reducing infestations during critical periods, but cannot be relied on to eliminate them and must be repeated until natural control factors become operative.

See also U.S.D.A. Circular 864 - The Western Pine Beetle by J. M. Whiteside (1951).

Red Turpentine Beetle

The Red Turpentine Beetle (Dendroctonus valens Lec.) attacks the base of injured, dying or healthy trees, or freshly cut logs and stumps of all pines and occasionally spruce, larch, and fir, throughout the western and northeastern parts of the United States and southern Canada. Ordinarily it is not considered an aggressive tree killer but it does do considerable primary damage and so weakens trees as to make them more susceptible to attack by other bark beetles. In some infestations, as in Monterey pine California, it causes sufficient damage to kill the tree. It is particularly active around logging operations, where it not only works in the stumps, but often produces catfaces on the bases of trees left in the reserve stand.

The adults are the largest bark beetles of this genus, measuring from 1/4 to 3/8 inch long, and are distinctly reddish in color. They are often called barber beetles by woodsmen, because of their ability to clip hairs, and are commonly, though erroneously, thought to be the bark beetles responsible for the destruction of pines. Their attacks are characterized by large reddish pitch tubes that form at the point of attack. On burrowing under the bark, the beetles excavate irregular longitudinal egg galleries between the bark and the wood. These galleries range from a few inches to several feet in length, as Patterson reports finding one gallery extending underground along a root for 15 feet from the point of entrance. The galleries are more or less packed with frass, and eggs are laid in groups or masses at intervals along the sides. The larvae feet out through the inner bark in mass formation, producing a cavity ranging from a few square inches to a square foot or more in area, between the bark and wood. These chambers are often filled with a resinous liquid that apparently has no injurious effect on the developing broods. Transformation to the adult stage occurs within pupal cells constructed in the boring dust of the brood chamber or in short mines along its margin.

There may be one or more generations annually, depending on locality and season. In the more southern range of the beetle it can be found in all stages of development at nearly any season of the year. The heaviest attacks occur in midsummer, and the winter is passed as larvae, new adults, and parent adults, in trees and stumps attacked the previous season.

Though this beetle is seldom of serious importance in commercial timber stands, should control measures become necessary, the broods can be destroyed by removing the bark from fresh stumps and from the base of infested trees. For the protection of individual park or shade trees, the damage can be halted by cutting out the attacking beetles with a knife or chisel as soon as pitch exudations indicate their presence. Successful control also has been obtained by injecting carbon disulfide into the galleries.

Ips Engraver Beetles

Smaller species of bark beetles, which work in the trunks and larger branches of pines and construct egg galleries that radiate from a central nuptial chamber and form distinctive patterns, are frequently referred to as the pine engraver beetles. These belong to Ips, Pityogenes, Orthotomicus, and related genera.

These bark beetles normally feed on the cambium of weakened, dying, or recently felled coniferous trees and are capable of developing in large numbers in such material as windfalls, snowbreak, logging and road slash, and also the tops of trees killed by Dendroctonus or other beetles. They are beneficial insofar as they help in the reduction of forest debris, but if large quantities of favorable host material are available they frequently develop and emerge in such numbers as to attack and seriously injure or kill adjacent groups of healthy trees. Under such conditions they are often exceedingly destructive to seedlings, saplings, and young second-growth poles, and the tops of older trees. While Dendroctonus beetles prefer to attack the thick bark of the main trunk and are, therefore, more destructive to mature trees, the engraver beetles usually select thin-bark trees for attack, thereby qualifying as primary enemies of younger trees. Some species are frequently found working in association with Dendroctonus beetles, in which case their attack is usually secondary, although some top-killing of trees by these engraver beetles precedes and possibly attracts subsequent infestation by Dendroctonus beetles. With the removal of mature forests, some authorities consider it likely that this group of bark beetles will outrank the Dendroctonus beetles in destructiveness to the second crop of pines.

The first evidence of attack by Ips beetles is yellow or reddish boring dust in bark crevices, or little piles of such dust around the entrance holes or on the ground beneath. Pitch tubes are seldom formed, and the boring dust is usually dry and free from pitch. Within 2 or 3 weeks after a tree has been attacked, the foliage fades and turns from green to yellow, sorrel, and red.

Attacks are made by these bark beetles with the coming of warm weather in the spring. An adult male broes through the bark and constructs a small cell or nuptial chamber in the inner bark. Several females then join in the work and each constructs an egg gallery in which eggs are laid in niches along the sides. The larvae, upon hatching, feed in the inner bark and work away from the egg galleries, leaving gradually widening, excrement-packed tunnels behind them.

Engraver beetles have a number of predaceous and parasitic enemies, but apparently these do not affect the numbers of the beetles so much as does the lack of suitable host material. Given a quantity of freshly cut slash or windfalls, a large beetle population is almost certain to be produced but it will not long survive after the supply of this material is exhausted.

The Western Six-Spined Engraver

The western Six-Spined Engraver (Ips ponderosae Sw) is a secondary enemy of ponderosa and digger pines. For the most part it attacks trees that have been felled or those dying from attacks of more primary species of bark beetles. The adults are about 1/4 inch long, reddish brown to black, with six spines on each side of the elytral declivity. The gallery pattern consists of two to five egg galleries extending up and down the tree from the central nuptial chamber. Though the pattern is similar to that of I. oregoni, the galleries are distinctly wider. This beetle has been recorded from Arizona, California, Montana, South Dakota, and Colorado and undoubtedly is present in other Western States.

The California Five-Spined Engraver

The California Five-Spined Engraver (Ips confusus (Lec.) is destructive to saplings, poles, young trees up to 30 inches in diameter (breast high), and the tops of mature trees. It commonly attacks ponderosa, sugar, western white, Coulter, digger and Monterey pines, and, less frequently, other pines in California and southern Oregon west of the Cascade and Sierra Nevada ranges. It breeds readily in slash and felled logs, and the broods developed in such material often cause extensive damage to the young pine growth in the vicinity.

The adults are reddish brown to pitch black, about 3/16 to 1/5 inch long, and have five spines on the margin of each side of the elytral declivity. The egg galleries usually comprise from three to five nearly straight tunnels radiating from a central entrance chamber. The typical form has three galleries in the shape of an inverted Y. The galleries are not packed with boring dust and are usually from 5 to 10 inches long. Attacks are started early in the spring and from two to five generations of beetles may develop during the summer. In the northern part of the range, at an elevation of about 3,000 feet, there are usually two summer generations which develop in fallen logs and a third, or overwintering generation, which develops in standing trees. At lower altitudes and in the southern part of the range there are from three to five summer generations. Most of the beetles overwinter in the adult stage, under the bark of recently killed trees.

Some attempts have been made in California to control outbreaks of this beetle in young pine stands by felling the trees and burning the infested bark during the winter and early spring months, much as is done in the control of the western pine beetle. Usually such methods are not warranted, as outbreaks are sporadic and can be avoided if roadway, line, or other slash created late in the winter, in the spring, and in the summer months is burned or lopped and scattered where it will be fully exposed to the sun. Such precautions are especially important in years showing a marked deficiency in spring precipitation.

The Digger Pine (P. sabiniana) is attacked by Ips Engraver beetles and by the Red Turpentine Beetle.

Enemies of Douglas Fir

Douglas fir as well as the pines has its full share of insect enemies.--- Where growth conditions are less favorable and the timber of inferior quality, bark beetle outbreaks of disastrous proportions are not an uncommon occurrence. The Douglas fir beetle causes most of the damage. Small Douglas firs are frequently killed by fir engraver beetles, particularly where large numbers of these small beetles have developed in windfalls or slash.

The Douglas Fir Beetle

The Douglas fir beetle (Dendroctonus pseudotsugae (Hopk.) is the most important bark beetle enemy of Douglas fir throughout its range in the Western States. It also attacks western larch. Normally it confines its attacks to felled, injured, or weakened trees and is not of great importance. At times, however, it becomes aggressive and kills apparently healthy, mature trees, singly and in groups, over extensive areas. Some serious epidemics have occurred in the Rocky Mountain region, particularly where trees were weakened by drought, fires, or defoliations, or where trees close to logging operations have been attacked by broods developed in slash. In the commercial Douglas-fir region of Oregon and Washington outbreaks are of less frequent occurrence, although the killing of groups of mature trees in second-growth stands is not uncommon.

Reddish or yellow boring dust caught in bark crevices or around the base of trees gives the first evidence of attack by the Douglas-fir beetles, as no pitch tubes are formed. The adults are reddish to dark brown, often black, beetles about 1/5 inch long and very similar to other Dendroctonus beetles except for their reddish color and their covering of conspicuous long hairs. These beetles work in pairs and construct egg galleries which are mostly in the inner bark, though they also slightly etch the sapwood. Tipical galleries are perpendicular, usually straight or slightly sinuous and average about a foot in length, though they may range from 6 to 30 inches. The eggs are laid in masses of 10 to 36 in grooves, at laternate intervals along the sides of the gallery.

Ordinarily the Douglas-fir beetle passes the winter in the adult stage, although small to mature larvae also may be found. The overwintering adults emerge rather early in the spring, but the delayed broods mature and emerge at any time throughout the summer months. It is also possible that some of the young overwintering larvae do not have time to complete their development before cold weather overtakes them in the fall, and consequently they are obliged to spend another winter in the host tree. One generation of beetles a year is probably the normal rate of development, but there is considerable overlapping and retardation of broods, somewhat obscuring the demarcation between generations.

The usual method of direct control is to fell the tree and cut the infested bole into logs, which are then decked and burned. As a large percentage of these insects overwinter as adults and emerge early in spring, fall control is the most effective.

See also U.S.D.A. Circular 817 - The Douglas-Fir Beetle by W.D. Bedard (1950).

The Flatheaded Fir Borer

The Flatheaded Fir Borer (Melanophila drummondi Kby.) is the species of this group most frequently found throughout the West attacking Douglas-fir, true firs, and hemlocks. It also attacks western larch, spruce, and possibly other conifers. Though preferring trees that are dying or recently felled, the beetles sometimes attack and kill apparently healthy trees. The adults are from 3/8 to 1/2 inch long and are metallic bronze or black with an iridescent sheen. Some of the beetles have bright golden spots on the wing covers. M. pini-edulis Burke works in dying or dead pinyon in Colorado, Utah, Arizona and New Mexico.

Certain small, flat, nearly black metallic beetles, called firebugs are well known to fire fighters in the pine region on account of their prevalence around forest fires, where they gather in large numbers on the men's backs or bite them on the neck, arms, and hands. They appear to be strongly attracted by the smoke of forest fires; and during conflagrations, owing to some peculiar instinct, they try frantically to lay their eggs on the still smoldering trees. Several species of Melanophila have this habit, the most common offenders being M. acuminata DeG. and M. consputa Lec., which attack badly fire-scorched or weakened pines, spruces, firs, and other conifers, and even some hardwoods. The larvae feed in the inner bark.

Douglas-fir Twig Weevil

The Douglas-fir twig weevil (Cylindrocopturus furnissi Buch.) attacks and kills scattered small branches or tips on open-grown Douglas fir reproduction and plantations. Therefore it is of concern to those who are growing Christmas trees. These attacks may deform and retard the growth of the trees. Some trees less than 5 feet high may be killed outright; but by the time Douglas-firs have attained a height of 15 to 20 feet, they are no longer subject to appreciable damage. Adults emerge from the middle of June to the first week in August. After feeding for about 1 month, they deposit eggs in small punctures on stems and branches. The small larvae bore down to the surface of the wood, where they extend their feeding galleries. On approaching maturity, the larvae frequently bore through the wood into the pith. Larvae of all sizes overwinter, and pupation takes place the following spring chiefly during May and June. There is one main generation and possibly a partial second each year. Natural control is obtained through host resistance, competition for food, and abundant parasitism. Artificial control has not been attempted.

Redwood Bark Beetle (Phloeosinus sequoiae)

Redwood trees are remarkable for their resistance to serious injury by insects but one genus (Phloeosinus) is found on redwoods, Port Orford cedar, juniper and cypress trees.

As a general rule these small oval beetles are not aggressive in their attack and are found working under the bark of trunks, tops, and limbs of weakened, dying, or felled trees, or of broken branches. Occasionally, however, they become sufficiently numerous and aggressive to attack and kill apparently healthy trees. Usually the greatest injury by these bark beetles is due to their habit, as newly emerged adults, of feeding on the twigs of healthy trees, causing them to break or die. This habit is similar to that of most species of Scolytus. In constructing their brood burrows the beetles work in pairs, and, while there is some variation in the work pattern, the typical egg gallery consists of one short, longitudinal gallery arising from an enlarged entrance chamber, with the eggs very uniformly spaced along the sides and the larval mines extending laterally in a very regular pattern. Trees are attacked in the spring and summer, and there may be one or one and one-half generations a year. The only method of artificial control is to fell and burn the infested trees or severely scorch the bark.

OAK MOTHS

California Oakworm

California Oakworm (Phryganidia californica Pack.) is one of the worst pests of the Coast live oak, Q. agrifolia, and occasionally attacks other trees. It is particularly injurious to shade and ornamental oaks in the San Francisco Bay district, and not only renders the trees unsightly but may seriously weaken or even kill them.

The moths have a body about 1/2 inch long, and wings of light brown with darker veins and a spread of about 1-1/4 inches. The males are distinguished by yellowish patches near the center of the forehead and by their broader and more feathery antennae. Fullgrown caterpillars are about 1 inch long, and dark olive green, with conspicuous black and yellow longitudinal stripes on the back and sides.

The females lay eggs in groups of 2 to 40 on the under side of oak leaves, on tree trunks, or other convenient places. The young caterpillars skeletonize the leaves, and later, as they reach full growth, consume all the leaf. Two generations are produced each year. The moths fly in June and again in November. The winter is passed in the egg and early larval stages.

Natural enemies include the spined soldier bug, a tachinid fly, and several species of wasplike parasites. A wilt disease takes a heavy toll of the caterpillars during epidemics. As a result of these natural control agencies, outbreaks occur only at irregular intervals.

This defoliator can be controlled by spraying in March and April with lead arsenate or DDT emulsion sprays when the worms are very small and again during the latter part of July and early in August.

LEAF BEETLES

Alder Flea Beetle

The alder flea beetle (Altica ambiens 9Lec.) is a native species found throughout the Pacific Coast States, where it feeds on and skeletonizes the foliage of alder, poplar, and willow, both as larvae and as adults. The adults are small, darky shiny blue, and about 1/4 inch long. The mature larvae are a trifle over 1/4 inch long, dull brown to black, with shining black head and thorax and three pairs of short legs. The adults hibernate during the winter in debris beneath the trees and other sheltered places, appearing early in the spring to resume feeding. Clusters of yellow eggs are deposited sometime after the spring appearance of the adults. The larvae, which appear a few days later, reach maturity in August, and pupate on the ground in the duff. New adults appear in a week or 10 days and feed voraciously on the foliage until the close of the season, when they hibernate for the winter, to appear the following spring, completing the cycle of one generation a year.

LEAF MINERS

These insects cut little wavy tunnels in the leaves of many broadleaf trees but do very little serious damage.

Madrone Shield Bearer

The Madrone shield bearer (Coptodisca arbutiells Busck) mines the leaves of madrone and cuts out elliptical holes when constructing the pupal cases. Commonly associated with it in leaves of madrone is another leaf-mining species, Marmara arbutiells Busck.

INSECTS WHICH WORK IN SEASONED OR DECAYING WOOD

There are hundreds of kinds of insects which work in dead and down trees and which under natural conditions perform a service in putting dead wood material back into the soil where it can again be used by living trees. Such insects do much damage when they work in wood which is built into houses, fences, furniture or other objects used by man. A few of the more important which may be found in hardwood and conifer snags or down logs are --

Powder post beetles which are tiny brown beetles which make little holes in the sapwood of hardwood trees and gradually reduce it to powder. Some will be found in oak, laurel, madrone and maple, and a few of them work in dry conifer wood.

Carpenter ants tunnel through the wood of stumps, logs, dead standing trees and sometimes in the framework of houses. The wood is not eaten by the ants but cast out to make room for the nests, causing little piles of wood fibres to collect below the entrance holes. They live on caterpillars and the honey dew of aphids. Carpenter ants are interesting to see in the forest but are quite hard to control if they infest a building. The best preventive is to use treated foundation timbers and to put them up off the ground on good rock or concrete foundations.

Termites or "white ants" are very destructive wood boring insects as they excavate large cavities in the wood of buildings or in the forest in stump logs or dead trees. They are dirty white in color and live in the ground or in the wood in darkness only coming out into the light at swarming time when they for a short time are in the winged form. They are an interesting group of insects to study and a good deal of information is available about preventing their attacks in buildings. This as is the case with carpenter ants, consists mostly in using timbers poisoned by a good wood preservative such as creosote or pentachlorophenol and keeping the wood of the building up off the ground on a good sturdy foundation.

You can keep a colony of termites alive in a closed jar for several months by giving them a few chips of wood and a small amount of water occasionally.