



FOREST TREES AND SHRUBS
OF CALIFORNIA.

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FOREST TREES OF CALIFORNIA.

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CALIFORNIA NUTMEG TREE.

(*Torreya Californica*.)

"Low whispering through the shade."—*Barbault*.

THIS very charming evergreen tree is one of the most fascinating of all the Yew family. Some, perhaps, are more grand and imposing, as the Kakatorro (*Dacrydium taxifolia*), of New Zealand; or elegantly fan-form and fern-like in foliage as the Ginko (*Salisburia adiantifolia*), and others of Asia. Our false nutmeg-like yew, and kindred species, so highly extolled and appreciated for beauty, are only separated from coniferous trees by their fruits not being collected into cones, each seed growing singly by its independent self and not protected by hardened scales, although sometimes in clusters of several. They are, nevertheless, in a similar manner resinous. These trees have also the general appearance and habit of conifers. From the most ancient times, all the *Taxads* have been celebrated for their remarkable firmness, durability, and great elasticity—held in highest renown for the primeval weapons of war—wars are still waged for their possession in the isles afar off, both for their bows and for their idols, and by the common consent of all mankind the timber is considered the best known in the world; our own appear to be no exception to the rule.

The California Nutmeg Tree towers in the coast forest, eighty to one hundred feet high; clean trunk of forty feet, straight as an arrow, and four feet in diameter. As more commonly seen, it is of moderate stature, say forty to sixty feet high by about two to three feet through. Wholly exposed, or partially, on the margins of woodlands, it may become smaller and more round-headed.

The leaves, from a yew point of view, are long, two to two and one half inches, narrow and line-like, rigid and flat, with very sharp awl-pointed or prickly tips, color rather dark shining green, arranged in two rows, one on each side of the twigs, after the usual way of yews, spruces, and firs.

These little branchlets divide by threes and fours flat fan-spread—the principal large branches, whirled around the main body; this wheel-branch feature is apparently lost in age or cloaked over as the top closes in and becomes full with myriads of soft drooping and flexible sprays—so surprisingly foreign to its earlier growth. At the first glance, one can scarcely realize this to be the same prudish Nutmeg Tree known before or elsewhere. Arrived at this maiden condition, the charm of her changes grow upon you, in many ways, amazingly; yet withal, in the highest degree pleasing—from the former stiff and formal foliage, or merely symmetrical branch and twig—the ever-vernal glossy tresses, in varied beauty, now begin to hang gracefully from head to bosom, festooning the boughs and thickening in the whole foliaceous expanse. This results, in a degree, from the natural persistence of leaves very far back on the branchlets; besides, the rigid two-rowed feature, mentioned before, becomes less strictly observed; it thus lightly thickens while it is not at all heavy, notwithstanding the rather dark deep varnished green mantle, but maintains a very tasty flossiness fully equal to the most graceful forms of Sitka Spruce (*Picea* [*Abies*] *sitchensis*), and only inferior in extent to the marvelous pending curtain-corded wreaths of the most elegant types of Douglas Spruce (*Pseudotsuga* [*Abies*] *Douglasii*); thus we view it common to kindred trees scattered over the western half of the continent of North America (by actual personal observation), comprising nearly all climes and conditions of the Pacific. Hence, in most cases, we conclude all that is peculiar is altogether caused by improvised richness super-added to favorite natural conditions of clime and soil; e. g. near recent rural residences or old deserted Indian villages or lodges, etc. The Nutmeg Tree thus standing on very fertile soil, and more out from the wood, as observed, where it greets the sun face to face the livelong day, the rigid, flat, precise, and formal Norfolk Island Pine style of open wheeled branch, tier above tier, is merged from the masculine, towering and aspiring top, into the humbler head of modest maidenly beauty, crowned in this delicate sheen of verdure, the transformed tree so captivates the beholder one can scarcely, with much effort, withdraw the spell-bound gaze; the reluctant eye, constantly returning, will fondly linger in painful pleasure at final parting with this pretty belle from the bowers of Paradise.

A large tree formerly grew on Papermill Creek, in Marin County, of which we preserve a sketch, for, alas! the vandals have long ago laid it low. A small typical tree may be seen at Mr. Harvey's, just outside his field fence at the bar-way entrance, close on the Santa Cruz roadside, fourteen miles below Pigeon Point. We have not the pleasure of this gen-

tleman's acquaintance—never saw him—but took special pains to find out his name many years ago, that we might remember him in our prayers and blessings so long as we live, and for ever after, for preserving that beautiful tree. But perhaps the grandest California Nutmeg Tree known on the coast is that near Duncan's Mills, in Mendocino County, over one hundred feet by four, forty feet of clear shaft, and straight as an arrow from the bow of the Great Archer himself; sound and flourishing in all vigor, with spreading top, rejoicing and ready as a strong man to run a race; well worth a pilgrimage to behold, in its glory; a noble and living witness that some lumbermen have sylvan consciences; may these and their shadows never be less.

Loth to leave the subject, a few words of descriptive detail and a general remark must close this preliminary notice. The bark is even, of darkish color; fruit, solitary or rarely clustering, close set, pending from the underside of the twigs, obovoid or oval, nearly two inches long by one and one quarter in diameter, plum or somewhat fig-shaped when divested of greenish longitudinally watermelon or pepo-stripped thick skin-like flesh; the inside meat-structure of the oblong nut or kernel, cut transversely across, resembles the internal structure of a nutmeg, hence the common name; and thereupon many foolish vagaries, bandied about by ignorance.

This tree extends from coast to sierra, up to at least four thousand six hundred feet near Yosemite Valley, as finely flourishing as here on the coast, but never in extensive groves; rarely in sociable numbers, often scattered, and rather rare. Found also in the southern Atlantic States, China, and Japan, but distinct species from that in California. There is not the slightest unpleasant odor in handling this tree, and to perpetuate such scandal by gratuitously foisting an obnoxious name—never known nor heard of save from some unreliable sources abroad, and echoed by Eastern ignorance—is deplorable. With some it certainly cannot be an effort to calumniate both men and things, in one fell swoop, reminding one of recoiling "total depravity," therefore are we fain to consider it one more instance in the long list of sins to be winked at.

PACIFIC YEW.

(Taxus brevifolia.)

"Bows of the tough yew."—Virgil.

A TREE forty to sixty, or even seventy-five feet high, one to two, rarely three feet in diameter; usually broadly conic in outline, sometimes more aspiring, but always of arboreal habit; body with a strong base, often unsymmetrically developed, or measuring one fourth to one third more in one diameter than another, covered with a flaky, thin, dark cherry-red bark, rarely a little shreddy; long and slim branches, horizontal or slightly depending; twigs slender, in flat fan-formed sprays, the shining green leaves closely set on very short tiny leaf-stems, arranged strictly in two rows, like redwood, hemlock, and trees of similar foliage, but rather darker, or richer, and much more glossy varnished green, about three fourths of an inch long, flat, line-like, and sharp pointed, a shade of lighter yellowish green beneath. The fruit is most charmingly ornamental, set underneath the finishing sprays in bright translucently red fleshy cups, the oblong cone-topped seed imbedded therein. This pretty pulpy cup is quite sweet and fruity; in short, edible.

Our Yews are certainly not yellow-green, neither are they sombre; for, first, the form is so free, open, and airy, and the foliage such a cheerful shining green, that it has altogether a vivacious effect; but were it dismally dense and formal, or dully dark and dirty in hue of bark, leaf, flower, or fruit, or stiff and heavy in any apparent sense, we might possibly, in some implied way, indorse, or at least copy, public sentiment. But, reader, if you please, put a beautiful sprig of it in our bouquet, cheery rubied fruit and all, and let it spirit us to the sweet spruce woods once more, happy as any child this side Eden. Should any say, "It's in bad taste," why, then, we must refer them to the wise proverbs of gray antiquity, which declare there is no disputing about such matters, for they belong chiefly to that higher realm of yea, yea, and nay, nay. At all events, let us agree that the conic form, when duly open and free, is the lightest, as in this case noted, nor dwell long on the lengthened careless toss of horizontal branch, and not too thickened spray, but winged with bright perpetual verdure, perfect integrity of form, storm-proof against all ordinary contingencies, or with ready and vigor-

ous replacement; tolerant of the most rigorous discipline, and patient of the greatest abuse; bright with those precious gemmed fruits in long succession, and that longevity "wherein the memory of man runneth not to the contrary." We say these, with unnumbered considerations, will forever commend the Pacific Yew to our high estimation.

Although Homer and Virgil speak of "bows of the tough yew," they were not mentioned in English history until the time of the Saxons, when the wood became so popular as to be quite exhausted in many countries. Modern recreations of elite archery are largely and profitably reviving the old demand; the timber is now already being transported East, and exported abroad. The matured heart-timber is deep red, or beefsteak-colored, hard, heavy, and apt to be brittle if at all short or cross-grained; makes excellent pulleys, friction-rollers, boxes, gudgeons, and for turning purposes in general is exceedingly valuable. Our species, at least, seems to stand well, for if half buried will slowly weather-wear away, but still keeps its size and soundness below for ages. No doubt there are preferred sections in this as in all other timbers. The boughs, within moderate limits of tension, have the quick snap and short twang for the bow, like its renowned congeners, and have ever been used by the natives here as of yore, and by young America even unto our day. But some of our native tribes seem to prefer the willow-root bow for the belly, sinew-lined on the back; ash for arrows, or the shoots of *tessaria borealis*. The Latin name *Taxus*, is supposed to be derived from the Greek *Toxon*, a bow. It should be added that the bark is clean and thin like madrono, sycamore, manzanita, and all such like trees, as together with Yew, flake off the old, and renew their exterior bark every year. The flowers—male and female—are found on the same tree; staminate, or males, in little heads seen solitary springing from axillary scaly buds, the yellow anthers standing out, shield or parasol-shaped, with six to eight folds or cells opening beneath; the female, green, broad-scaly, at first like a tiny acorn, fairy cup and all, the upper united scale or rather bractoid base, at length thickening into a nest-like ruby red coroloid fleshy cup, the rim of which often becomes higher than the little nut-like seed that sits so portly in it.

The Pacific Yew is never naturally degraded, groveling low upon the ground, like the disconsolate Eastern one; and if we must needs personify it, like the true child of nature, or the barbarous Indian, then let it be to him the "fighting wood," because he maketh of it the death-dealing bow. But to our more genial eye, it rejoices in a song of freedom and recreation, above, among the trees of the forest, apter emblem of more elevated and cheerful views of life, or

death, if you will, as only another and higher step or birth in life, instinct with joy and gladness and the voice of melody.

Found in the whole coast range of California, and so northward to the Cascades in Oregon, and to our Sierras, growing along cold, shady creek banks, and in damp ravines and deep gorges, often in considerable numbers, as on Yew Creek, in Mendocino County and elsewhere, but never in groves.

LAUREL HAWTHORN, OR TOYON TREE.

(*Heteromeles* [Photinia] *Arbutifolia*.)

"Mark the fair blooming of the hawthorn tree,
Finely clothed in a robe of white."—*Wm. Brown*.

KINDRED to the renowned Rowan Tree (*Pirus aucuparia*), and sacred to somewhat similar associations, few denizens of the wild woods possess greater interest than the Toyon tree, or Laurel Hawthorn. A shrub, or small tree, five to twenty-five feet high, from a few inches to a foot in diameter; leaves thick and leathery, oblong or elliptical, lance-like, sharp at the ends, and sometimes at the base, two to four inches long, half an inch or more broad; leaf-stem stout and short, margins saw-toothed, the shallow teeth sharp, usually tipped with a gland, color sap-green above, and lighter yellowish green beneath. Seen abroad, along the sandy coast, it is more dusty and sombre; but massed or clumped on our hillsides, bending over the brow of the cliff, or perched on the point of rocks looking seaward, this winter-green shrub glows in livelier, lighter hues than oaks, and a thousand other surrounding foliage; this becomes still more conspicuously manifest as it climbs the dry hills, and is again altogether a rounded shrub. The numerous little white flowers, Hawthorn-like, or less than half an inch across, are in large compound clusters of a span or so, on the ends of sturdy twigs; petals or flower leaves are roundish and slightly scalloped, on short claws; five-toothed cup, short and thick, becoming still more thickened and imbedded on the end of the fruit, like partridge berries, or tiny twin berry (*Michella*), huckleberries, wintergreen, etc.; stamens, ten—two opposite each tooth; central styles two, more or less united; at length the bright scarlet berries, which all along late Summer and Autumn, have been a little turbaned, or remotely pear-shaped, swell out nearly globular,

and are less oblong. These are usually about the size and color of wintergreen berries (*Gaultheria procumbens*); in the recent state these beautiful berries have but little odor, but when dry the piquant spicy odor is exceedingly refreshing, and nothing is more lasting, abiding still fragrant, we know not how many years, but apparently increasing with age. The berries eaten from the tree have a pleasant, thorn-apple (*Crategus*) flavor. They are parched by the Indians and eaten so, or ground and used as a kind of coffee, or thickened into mush, or made into bread, cake, or the like, when it has a peculiar nutty flavor. It blooms chiefly from June to August; yet here and there fine clusters of flowers may be found at any season of the year; the thickly-set laurel-like leaves extend close up to, and lesser ones in among the flowers; it fully ripens its great masses of bright red berries about merry Christmas, hence it is often called "Christmas Tree," and the fruit "Christmas Berries," in part from this coincidence; but mainly because of its universal devotion to those religious and rural adornments that will ever associate the concomitant Toyon Tree with all the innocent social festivities of that season, and of the "Happy New Year." Yet, withal, to the unbiased eye of art, and to the appreciative landscape gardener, the brilliant contrast, soothing warmth, and harmony of bright red on a background of green—ruby in emerald, and at such a season of the year, too—will always commend this Laurel Hawthorn as one of the chief ornamental charms of the coast. Even the faults of the formal and rigid become merits when they contribute to the Winter scene an air of calm, serious stillness, in peaceful keeping with the general hush of the Great Mother, while her large family is sleeping! Nor is this equanimity ever disturbed at seasons claiming less attention—the constant gales that deform the sturdiest oaks and other hardy trees and shrubs, pass harmlessly by the Laurel Hawthorn and the Satin-tassel trees, and but few besides, little, if at all, the worse for the fierce war waged on them during our wintry Summer winds.

The bark has a cherry or pleasant bitter almond flavor, and possesses similar medicinal virtues, which, indeed, would well nigh fill a volume to delineate in detail. The wood, especially the root, is highly ornamental, but has hitherto attracted little notice.

SATIN-TASSEL TREE.

(Garrya elliptica.)

"The mind—that ocean where each kind
Doth straight its own resemblance find."—*Marvel.*

A LARGE evergreen shrub or tree; eight to fifteen or twenty feet high, three inches to a foot or more in diameter; the most notable for size lately grew near San Francisco, at the San Bruno Mountains, having five principal branches, each five to six inches in diameter from a short main body about one and a half feet in diameter—surpassing any oak trees of the vicinity. This tree, indeed, bears some casual resemblance to the Field Live Oak (*Q. agrifolia*); but the Satin-tassel tree has opposite entire leaves, *i. e.* without teeth, or lobes; on the contrary, most oaks have saw-teeth, frequently more or less deeply cleft or bayed leaves—always alternate; this has the twigs also somewhat four-angled. Of course, if the fruit of the female tree is observed, it is found in clusters of tiny little grapy bunches of purple bladdery-like berries, more or less silky, which stain your fingers purple on pinching them, even though dry and crispy-skinned outside—then to you, this tree is no longer doubtful; and as the fascicles of stiff tags—one to three inches long—fruits, or relics of some one remain on all the year round, they never lack a present manifest witness of their identity. The leaves of both male and female trees are alike elliptical, base rounded, mostly sharp pointed; margins wavy-bent, dark green and smooth above; whitish, with short wool beneath, one and a half to two inches long, about an inch or so broad; nevertheless many details must needs be omitted. So only, the aided and quickened eye of the observer, seize some relatively strong points that distinguish them and pass on. Confronted with the masculine tree, which promptly steps to the front rank of sylvan beauty, when in Winter or early Spring his partner's modesty makes but humble display; behold the long satiny tags, five to eight inches in length, pendant in parallel plumb lines on the tranquil air of calm days, or early dawn, like little lambs tails on the lawn; air of the honest, and the upright, e'en to the last jot; in perfect keeping with rectitude to the extremest frankness and candor of innocence; in a word, these tags, or catkins, are the most sensitive, softest, and most flexile satiny pearls, strung with living lines, ever hung on emerald mantle. From out the vast empyrean of love, significance to landscape art, to

painter, or to poet, ruralist or sage, higher and highest, is ever begotten, ruled in wisdom, registered on all these—His works. To us, this Tassel Tree mingles with the rugged and sturdy, sober, and serious, somewhat of the pretty and the playful. Return with us again; view it astirred by the breeze; now, those long limsy tags in their rollicking giddy motions will surely remind you, in their perfect abandon, of those wanton lamb's tails—when the lambs themselves were wont to play "tag" on the sunny old barn floor of a gay Spring morn, in the days when you were young; or witness the like joyous lines and big successive drops leap out the cascade, arching airy diamonds aloft with an extra touch and toss of freedom, grace, and beauty, high above and beyond, arating the choicest gems of the fountain; or have we in all serenity of delight seen the lambs cascading, tail and all, in a similar way? then tell us if they do not run together in parallel lines of a just similitude adown to the great ocean of truth.

The wood appears to be exceedingly hard and tough, but we have no knowledge of its applied use. As a tonic and febrifuge it is scarce at all inferior to Peruvian barks. Of the *Garryas* we have about half a dozen species, of which this is, perhaps, the best type. Ere long we trust they will be duly appreciated, for ornament, for medicine, and for other uses.

CALIFORNIA MYRTLE, OR SWEET-GALE TREE.

(*Myrica Californica*.)

"Sitting in a pleasant shade,
Which a grove of myrtles made."—*Burnerfield*.

A TREE thirty to forty feet high, one to three feet in diameter; always a large shrub of ten to twenty feet, emulating trees. These dark evergreen, densely leafy shrubs or trees, are covered with balsamic glands that yield their sweet aroma to the breeze, and when bruised in the hand, emit a strong but refreshing resinous, or rather balsamic odor, as observed, that greatly reminds you of the Eastern little sweet-fern shrub (*Comptonia asplenifolia*), to which it is allied; to the European, however, it recalls the delightfully fragrant Sweet Gale (*Myrica Gale*), of his home beyond the waves; and, by the way, it should be noted that the true Sweet Gale is also a native of California, found in the cañons in the vicinity of Yosemite, where we collected it many years ago. These Myrtle leaves are rather narrow,

one half inch or less, lance-shaped, about three inches long, somewhat saw-toothed on the margins, chiefly above, moderately wedged towards the base, alternate, and when young, of a bright, lively, yellowish-green tint, slightly varnished, the color nearly alike on both surfaces; this cheerful hue is very pleasing to the eye, seen against the darker background of the old and denser foliage itself. In all the earlier periods of growth, even well nigh unto old age, the habit is mainly more strict and erect than much spreading; bark, dark iron-hued, not very rough, often smoothish; aments or tags, very short and crowded, not conspicuous; the granular-surfaced berries of the size of peas, clusters situated along the twigs near the end of the previous year's growth, they are dark purple, staining the fingers on pressure; the very thin pelticle of wax is so obscure one is apt to overlook it altogether unless special attention is called to solve the question.

The largest Myrtle ever seen here, so far as I am aware, flourished in the heart of the City of San Francisco many years ago. This was renowned for its massive proportions, consisting of three large tree-like trunks, each about a foot in diameter, from a short base, or main body, nine feet in circumference. This grand sentinel stood guard by a spring on the eastern slope of Russian Hill, under whose shadows the early emigrant of '49 camped. Groves of them hid the marshes of the lower portions of the city, but they are gone, as perhaps most of their companions soon will be forever. So, also, along the banks of Lobos Creek, and elsewhere, it was no unusual sight to see trees one, to one and one half feet in diameter, and thirty-five to forty feet or more high, yet even these, which any tolerably enlightened self-interest would have preserved, a wanton water company cut away; nevertheless, we have an abiding faith that it will not always be so. Let us turn our eyes from the pit of our own and others' errors. Full of the charm that fascinates, in communion with nature, is not the gay flower, the handsome leaf, nor any symmetry of form in outline, mass, or detail, nor grace of motion, waving with the wind, nor rustling in sympathy when astir and softly pillowed by the gentle zephyr; nay, but whatsoever hath paramount power to move most deeply the affections which underlie all the blandished arts and airs—and these are those sweet aromas that wake the soul to love. They come down anon with overwhelming power in our inspirations of ethereal Autumn airs, when all the landscape is brown and bare, when the cloud-curtain of the faded year is ready to drop on all that was beautiful and fair to view without, overshadowed the divinely human, transfigured, we feel that it is good to be there—are ready to pitch the tents of peace and dwell therein forever. But returning, are there not thousands of similar

kindred mysteries to Myrtle odors in every one's personal experience, that commend them and their like to culture? or what else is it that hallows and charms our affections, but sweetness of spirit, and other mental quality within, that so blinds us to irregular forms and features of friends, objective or individual, with whom we hold such pleasant converse? Is it not the real soul, or something like it on the other side, beaming through? Or let us reconsider the ground of our esteem for numberless pets of the garden, field, and forest—true, one of a thousand may possibly be fairer to us than the rose or the lily, and altogether lovely; if so, we have indeed found at least one of the real trees of natural life, perchance of foliage, flowers, and fruits of honor; trees of renown, the planting of Jehovah, that He may be glorified, glorified in man, in that only paradise of the soul, wherein is found celestial joy and gladness and the voice of melody.

As these Myrtles abound in benzoic and tannic acids, resinous matters, and fragrant volatile oils, the bark and leaves are esteemed in the arts and for medicine. The wood is used as fuel.

WESTERN JUNIPER.

(*Juniperus Occidentalis*.)

"And as Elijah lay and slept under a Juniper tree, behold, then an angel touched him."—*Ancient Book of Kings*, Vol. I: xix: 6.

THE Western Juniper is one of the most venerable and picturesque trees of all the higher mountain regions of California—venerable as to appearance, and for the vast antiquity of the larger trees, which date far back, nearly to the Great Sequoian age; and picturesque, for often hundreds, nay, thousands of miles may be traversed without meeting a single perfect tree. All seem more or less dismantled, or the top altogether carried away by storms or the ever-recurring snow-slides. When viewing these veterans, let us bear in mind they have braved the eventful cycles of time, that are measured by many thousands of years, with a vitality almost equal to the olive tree. If killed by any cause on one side, the other still goes on its life-long journey, eccentrically developing, until the investigator finds it convenient to take bearings in order to determine the original center. This broad base of accelerated expansion is always more or less unsymmetrical by those big bars of swelled or anguloid eccentricity so eminently characteristic. Above, it

rapidly tapers to an attenuated top. Whole groves of the typical tree may be sometimes seen forty to fifty feet high, from a body eight to ten feet in diameter of the most perfectly free and unmolested development in relatively rich soil at the head of Carson River, or in a few of the most favorable cold alpine valleys.

The bark is of light cinnamon color; fibers somewhat shreddy, which beautifully interlace, and are nicely netted. The finely, as it were, braided cord-like twiglets are remarkably condensed or matted, thickening the final spray. Thus it well maintains the expression of rigorous vitality, altogether suited to the perilous regions it inhabits—that is, along rocky mountain sides, mostly in close contiguity to the line of perpetual snows; or for the California Sierras, say up to about ten thousand feet altitude. It has also a very extensive range of country from Pitt River to east of the Cascades, in Oregon, and throughout our high Sierras, and towards the Rocky Mountains, until it meets the Red Pencil Cedar, or Eastern Juniper (*J. Virginiana*), in the Zuni Mountains of New Mexico, and even into Texas. The wood of this, however, is not so red inside, nor so fragrant, but lighter and yellowish; is equally durable, and of like value. The tiny leaf-scales are fringed on the margins (the Eastern leaf margins smooth), and branchlets four-angled; leaf-scales mostly in threes, often in pairs, blunt tipped or scarcely a little sharp, more resinous, and silvery sheened; in the young state the glands are obscure; manifest enough in age. The blue-bloomed berries rather large, over a third of an inch in diameter, spheroidal, one or more seeded; the color beneath the bloom brownish, and sweeter tasted; when heated or burned, exhales a delightful aromatic incense, both exhilarating and highly salubrious. They also furnish boughs and twigs for a durable esculapian bed for the feeble pilgrim who is wise enough to spend a season of rejuvenation in the mountains and spread his primitive couch of them beside their all-glorious camp-fires. As these ecstatic aromas excite the affections and promote grateful perceptions, whence is all true adoration and blessedness, it is no wonder the prophet felt the angel touch him, an angel of health, if no other; nor that our sage ancestors burnt the Juniper around their dwellings to keep away evil spirits, or exorcise the demons of infection and every sort of plague, and held that an especially fortunate family, which was willing and well to do, withal so scrupulously neat as to strew faithfully their floors every Friday with some of these branches. We dare say along their devout footpaths arose some hallowed incense from the family altar.

Finally, if we view this tree securely sheltered from its manifold misfortunes that overtake it in its more exposed

haunts, say in high mountain vales, or along the banks of those streams, it becomes a very handsome tree. One can scarcely realize the great contrast of elegance and beauty—perhaps, among a thousand expressions, the most general and striking is that stubborn air of death-grapple, and evermore irrepressible conflict of these veterans of a thousand wars, against all the combined elements of earth and heaven. Offset to this conic top of well defined, softly green, and graceful boughs and body, you still behold maintained the perfect symmetry of strength below. Or, yonder stands the usual type, a tree well nigh in ruins, perchance bygone greatness half in ruins, with modern repairs; or, it may be only a relic of passed glory, now lonely and neglected; here and there venerable and grave, anon grotesque, always in a high degree picturesque. But really who may tell all the varied expressions of this marvelous Great Far Western Juniper? They are more than can be numbered, nor may any artist ever cease to admire this inexhaustible sylvan study. They invite a volume of comment, we dare not enter the field, but wait with eyes afar over the landscape looking for the coming man.

To dwell upon its durable timber qualities, would be to repeat the lore of Cedar and Juniper renown; as live fences, rock and wall screens, naval knees, boats, common carpenter and cabinet work, and all uses where light, close-grained, soft, smooth, and compact wood is wanted.

CALIFORNIA JUNIPER.

(*Juniperus Californica*.)

"And she cast the boy under one of the shrubs"—of juniper.—*Moses*, Gen. XXI: 15.

THIS species is full oft only a large depressed shrub, or a small tree of twenty to thirty feet high; bark of body brown and shreddy; wood pale; outline of top irregular; branchlets thickest of any of the savin section; tiny scale leaves usually in threes; on young shoots they are loose and awl-form, white above; in age, they become short and thick, rounded at the tips, horny, eye-lashed, or fringed on the margin. These least twigs present the usual appearance of finely corded sprays, least, larger, and largest; these last being more loose and scale like. In the male flowers the anther scales mostly in threes, eighteen to twenty-four, rhombic, scarcely acute; scales of the female, tiny aments

usually six, and spreading; the galbuloid berry globose or oval, five to six lines long, signs of scale tips, or mucros scarcely prominent; seeds one, or sometimes two, four to six lines long; shell very hard, thick, and smooth, shining brown above, with large bilobed whitish hilum.

We are apt to confound this common coast and island species with the Great Far Western Juniper (*J. occidentales*). However, as Dr. Englemann observes, it is readily distinguished by the fruit, this having a dryer, sweetish, and not so resinous tasted berry, which is larger and reddish blue bloomy (instead of being smaller and bluish black, or rarely brown, as *occidentalis* is). Found in the vicinity of San Francisco, on the Oakland hills, Mount Tamalpais, and Mount Diablo, all along the coast range in general, and on the islands off the coast southward; also, said to be in the Sierras, and so on to Utah and Arizona.

Junipers readily clip to any pattern, and thus form the most substantial, perfect, and lasting screens, walls, mantels, or mats of verdure, over the most arid, sterile, sandy, or rocky places, etc. Whenever planted and trained over or against objects deemed desirable to conceal, there is in this, only a furtherance of the order of nature, and because all men and things together tend towards sympathy, and manifold harmony, orderly, or disorderly with their surroundings, therefore it is, when with the former, that our eye dwells with more pleasing satisfaction upon forms that do little or no violence to the order of nature. Who can fail to admire the responsive facility with which the minor species of juniper like this, thicken in, and apply themselves to that humble habit that, with a hint of training, they so readily take on, of shielding the rude and the rejected; laying the soft and soothing hand of natural beauty over the sharp and ragged rocks, lighting up the lonely and desolate places of the land; venerable in sacred classics for shielding the wild ass boy of the wilderness and archer of the desert; the bright leader in sciences and human rationals.

The universal use of these berries in beer and spirits, is already too well known. Hitherto there has been no call, to speak of, on this coast for such superior timber; but if ever a naval demand for knees, or short ship timbers should arise, no lack of resource will be likely to limit the supply.

LAWSON'S FRAGRANT CYPRESS.

(Chamæcyparis Lawsoniana.)

"In Autumn, when the sunlight crowns the cedar-covered hill,
Shadows lengthen in the valley—shadows ominous and still."

SPIRITED before you stands undoubtedly the handsomest of all our Cypress family, the graceful Oregon Cedar—Port Orford Cedar, otherwise known also as Ginger Pine of lumbermen—every form of it a curve or line of beauty. Behold in detail the little flat and fan-like sprays, every one of them latterally bent and gracefully curved, as the lesser waves curve on the great swell that rolls responsive over another sea of emerald; and the long leader bough that crowns the pinnacle of its glory, bending off at a right angle as it bows to the breeze the most graceful among the ever graceful ostrich-like plumes, as wavelets o'er waves are piled, climbing her ever verdant pyramid of foliage until lost in the clouds or merged far up in the blue; and, over all this, a softened sheen of almost invisible silvery gloss, lovely as an infant's or maiden's skin; indeed there is not a masculine, scarce a mere intellectual angular feature anywhere to be found about this charming tree. Granted space to spread freely in sunlight and air, the slender branches, although early ascending horizontal or depending with rising extremities, nevertheless the final boughs and ultimate sprays always hang down their modest heads—those below, nearly to the ground—and so maintain the ruling feminine expression at all points and at all stages of growth. Free, in the land of the free, she develops as all orderly things should, upon her own God-given type, a light columnoid conic-topped tree of refreshing symmetry; and no thanks to thee, oh barbarous scissors—the abomination of all the trees. When closed in and crowded by aggressive neighbors, the body is prudish and straight to a line often fifty to one hundred feet, with neither knot nor limb; in such cases trees often attain to one hundred and fifty to two hundred feet or more, with that elegant shaft four to eight feet in diameter. The timber is held in very high estimation for floors, blinds, and doors, finishing work, and for manifold purposes where clear, free, soft, and durable wood is requisite; is rich, very delicately cream-tinted, finishes uniformly smooth, like eastern white pine; for ceilings of rooms the aroma is found to be in a high degree sanitary; it has become the principal wood used for tubs, pails, etc., and is found excellent for boats and ships,

for hollow wood-ware, when bound with brazen hoops, exceedingly neat and lasting. It should be observed, however, that it is to be avoided for most cabinet work, *i. e.* where delicate linen and the like are kept, on account of the volatile resin permeating and discoloring all such like goods, and that to such degree as to utterly ruin them; also, smooth and hard bodies condense it rapidly, and are soon all gummed over with dewy, and ever increasing dots, or rubied or wine-colored resin, that tarnishes to an intolerable nuisance, to say the least. For shingles, this with redwood and incense cedars, and the like, the State and coast has the amplest supply, besides that vast sylvan mine of the Great Sequoias.

A tree so choice for rural adornment requires a word of caution concerning its culture. Perhaps one of the greatest and most radical faults in the propagation of these and similar trees, is that of covering the seed with soil. In nature, they germinate on the surface, root down, and shoot up from that point, so that the pith is never below the moistened earth-level whence they spring, therefore they never sicken, sour, and in their agony, succor abnormally, become stunted and precocious, crippled from the cradle, but go on in the harmony and order of nature, prospering and to prosper. True, this is hidden to all but the intelligent eye until the charm of their youth is gone. A hint to the wise in passing must suffice. Having so often seen the ill effects of a contrary course, as duty demands we enter our protest against the profanity that ignores the sacred lessons inscribed on every page of the great Book of Nature. Easy would it be to point out the rationale on physiological grounds, but this must be left to the inquiry and intuitions of those whom it may most concern. There are many other important points of interest, best known to cultivators, that require to be observed in treating trees, especially those designed for a hardy endurance of severe climes.* This beautiful wintergreen conifer is found on the Coast and Sierra connecting ranges of mountains of Northern California, in the Shasta and Scott mountain ranges, only a few rarely straggling along south.

* Naturally the lower limbs of trees subserve the fundamental use of accumulating base material for future prosperity and endurance, as bulbs do from former leaf-growth, storing up their early acquisitions as frugal deposits, in anticipation of final flowers and fruits of more mature age. This principle is even more manifest in Agaves and the like, which fail to thrive—never flower or fruit if deprived of their lower leaves.

INCENSE CEDAR.

(Libocedrus Decurrens.)

"Down in a vale, where lucid waters played,
And mountain cedars stretched their downward shade."

—Sir Philip Sidney.

THIS great Cedar of our coast and mountains is remarkable for its super-eminent use, beauty, precision, and aspiring grandeur. Devoted to the conic plan, few diverted limbs ever spread afar to mar the general purpose—elegant and upright in early life, it becomes at length grand and dignified with age; is also eminently noted for great rapidity of growth, wonderful lightness, stiffness, and extraordinary durability; in short, a thousand uses have sprung up, and are multiplying around this interesting Cedar as its most inestimable qualities become better known. Fortunately for us, it is one of the most extensively distributed trees of the Pacific—found from the coast range north, south to San Diego, Sierra Nevada, Southern Oregon, and most of the interior mountain region, from two thousand to four thousand feet, and even thrives quite well at six thousand six hundred feet altitude; and, so far as we have observed, seems to give out at seven thousand—said to extend to eight thousand five hundred (?). As usual with our sylvia, flora, and fauna, this also is found lowest along the coast where it finds the requisite temperature, etc., with combined moisture. The base and lower trunk somewhat resembles the Western Juniper (*J. Occidentalis*); it is to be noted in general that trees of such broad, outwardly sweeping, or expanded bases seldom blow over, and to the perceptive and artistic eye their significant expression is one of firmness and stability; one hundred to two hundred feet high, six to nine feet in diameter—rarely larger—the shaft often clear of limbs eighty to one hundred feet, and although the lower limbs, or even dry branches, may encumber the middle portion, pin-knots do not damage the timber. As the massive body tapers more rapidly above than redwood, and is less eccentric than Juniper, nevertheless its general port reminds one most of the best specimens of this latter; the light cinnamon-bark is thick, of shreddy-fibered texture, but so concretely compacted as to render the surface evenly ridged by very long, big bars of bark; these sweep obliquely down on the long spiral twist of swift water lines, which gives it the expression of deep, determined currents, and adds to dig-

nity, decision, and force of character. Top conic, the foliage, closely viewed, is in compressed, flattened sprays, aspiring and upright, thickened and somewhat succulent or luxuriously tender, if not languid type, at least in no sense rigid, nor thrillingly sensitive to the breeze, but concurrently moving in masses, bears some resemblance to the Great Western Arborvitæ (*Thuja Gigantea*), but these tiny leaf-scales are opposite and quite awl-pointed; besides the close-pressed, adherent base runs far down along the twigs below the free tips; general hue of the foliage light yellowish-green, or warm-tinted, beautifully golden bead-tipped, with tiny oblong male catkins, as the fruit ripens in October and November; cones pendulous from the tips of twigs, oblong, egg-form of six very unequal scales, two principal ones, or large pair, swelled on the back gradually below, pointed on the back just below the tip; intermediate pair much narrowed, a few bract-like, spine-tipped, short scales under the base; seeds oblong, like a grain of rye, two-winged, one wing developed to the size of the larger scales; the other is at its side, below, and much smaller; cone seldom over three quarters of an inch long, little more than one third as thick, and for the most part a trifle compressed; wood, pale cream-tinted in color, a delicate salmon shade. This would hardly warrant the name of White Cedar, sometimes applied to it, as well as to the Giant Arborvitæ. The extreme lightness of the lumber, and its sweetness for packing-boxes will commend it for express and commercial purposes, for posts and fencing, and especially railway ties, for sleepers, stringers, and ground timbers of all varieties, and for unnumbered uses, a tithe of which cannot be told in this brief notice. Formerly these trees were cut away and burned up to clear the track for redwood, tamarack, and ponderous pitch pines, etc.; now all else is superseded by this Incense Cedar. Thus we see how hasty and ill-advised notions give place to genuine merit.

A fungus (*Dædalus*) attacks and honeycombs it; and riddled as it may occasionally be, still if spike or nail find substance enough to hold, or sufficient solidity to resist crushing, then practically for many purposes, even such lumber is as good as the soundest timber; because, when the tree dies the fungus dies, and thenceforth will absorb no more moisture than the soundest part, and is alike imperishable, contrary to common experience in similar cases. This is another timber nearly as lasting as solid granite; hence we see how little reliance is to be placed upon ignorant assertions of transient visitors from abroad. For ship or boat lumber, the clear stuff, from sound wood, is so exceedingly light, stiff, and durable, and practically so abounds as to be available, few timbers on this or any other coast can excel it, unless we

except the Yellow Cedar or Cypress (*Cupressus Nutkaensis*), which is a little tougher, stronger, perhaps more elastic, and equally durable, if one may be allowed to judge apart from thorough tests and careful data, which the apathy or ignorance of some Governments appear to deem unworthy their subline attention. There are in California a thousand times more and better kinds of naval timbers on Government lands as important to preserve as the Live Oaks of the South Atlantic States. It would not in the least surprise me if, after due investigation, California would be found to possess a vast amount of the best naval timber in the world, and a hundredfold more lasting than the best now in use, if we except a few of which there is no adequate supply worth mentioning anywhere.

THE GREAT WASHINGTON CEDAR.*

(*Sequoia gigantea*.)

"If I will that he tarry, 'till I come, what is that to thee."

—*The last of John.*

WE cannot give a full history of this wonderful tree here, suffice to say, briefly, for in this we chiefly collate from Mr. J. Muir, who has best said, substantially: "The great *Sequoian* timber belt lies along the Sierras upon the first exposed mountain side," moraines of recent retiring glaciers that face the Pacific from Calaveras on the north, to near the head of Deer Creek on the south, a distance of two hundred miles, or little above thirty-eight degrees north to a little below thirty-six degrees; altitude, five to eight thousand, rarely eight thousand four hundred feet, broken by two gaps, each forty miles wide, caused by manifest topographical and glacial reasons given; one gap between Calaveras and Tuolumne, the other between Fresno and King's River; thence the vast forest trends south across the broad basins of Kaweah and Tule, a distance of seventy miles, on fresh moraine soil ground, from high mountain flanks by glaciers. The inscriptions (we have often examined with

*As historic truth demands, it is but just to say, I, myself, took Mr. Lobb to the California Academy of Sciences, and showed him the first specimens he ever saw of this marvelous, now world-renowned, Washington Cedar, which was so named by me, before he ever saw the tree. This fact is well known to the old charter members of the Academy, several of whom are still living; it is therefore the earliest among common names, and claims precedence, by all courtesy, in point of time, as also in appropriateness of honor. Our relations to its earliest identification we leave to the historian of the future.

Mr. J. Muir) scarce at all marred by post-glacial agents, and the contiguous water-worn marks are often so slight in the rock-bound streams as to be measured by a few inches. Rarely does one of these sound and vigorous cedars fall, and if so, lie eight hundred to a thousand years, scarcely less perishable than the granite on which it grew. The great Sequoian ditches, dug at a blow by their fall, and the tree tumuli, always turned up beside the deep root-bowls, remain, *but not a vestige of one outside the present forests has yet presented itself*, hence the area has not been diminished during the last eight or ten thousand years, and probably not at all in post-glacial times; the notion, therefore, that this species tends towards extinction more than others, or the planet itself, seems absurd, for its vital vigor is assured in ages past and present, and, so far as mundane things can be, to come. These collossally sublime *Sequoias* rise two hundred and seventy-five, three hundred, and even four hundred feet aloft, are twenty to thirty, and in some rare cases, forty feet in diameter, like vast columnar pillars of the skies. No known trees of the world compare with them and their kin, the Redwoods, for the focused proximity of such a marvelous amount of timber within limited areas; as it were, the *ne plus ultra* standard of timber land capacity. Nor is language alone adequate to impress upon us any due realizing sense of such vast tree magnitude without comparative and associated statements, as if this were the all important idea, and truly the utilitarian is a good foundation, indeed enormous factor of some import; thus, the stage-coach passes through one; one hundred and twenty children and a piano crowd inside another; house for cotillion parties to dance "stout on stumps;" horse and rider travel afar within burnt out hollows of others, and so on, with variations. A single tree would furnish two-rail fencing twenty to thirty miles, etc.

Having often visited these groves, a word may be allowed relative to their sylvan claims, apart from lumber and cordwood contemplations. Familiar as we all are with their ready growth into sturdy conic juvenile trees, with exceeding broad swoop of base, we pass to these of columnarly towering and spiry-topped youth of a few hundred years or so; then, at length, we behold face to face the Great Washington Cedar in its prime, to the grand and picturesque with the ages. To our view, their expression is one of softened and more lovely beauty with advancing years; vastness harmoniously merges into dignity and elegance, even in the most picturesque, with here and there huge arms thrust out towards the horizon round about; never exhibit the wayward vagrancy of many other trees, but so soon as they approach the appropriate outline of towering symmetry,

swoop upwards in one grand triumphant air of sublime attitude, their bright and burning arms aloft, appealing to Jove's high throne in the heavens. The lesser and more massed branches accumulate above in ever-refreshing variety, insphering the upper body, and crowning the venerable domed head and massive brow in a halo of softer, serenener glory. Fragments of special foliage in rounded or varied tufts and touches, tiny buttoned bouquets of beauty, as it were, pinned on gracefully here and there for effect, to foil herculean brawn—so in least as in largest, to fill and soothe the sense; the tiny, tender, slender, and delicate little sprigs e'en hiding the finishing hand that gives the final touch of the Great Artist, forcible reminder of the light gauzy texture lines of the finest figures of our earth-born artists; but these drawn by hallowed hands on the celestial canvas—pictures of inimitable grace and beauty graven on the blue tablet of the skies. But what should be said of that great behemoth-like hide of bright cinnamon brown bark, in massive mantle folds one to two feet thick of lightly compacted shreddy fibres, darker on the shady side, or in youth and early prime tinted in royal purple, nay, crimson-fired in the lingering smiles of the western sun's adieu. Then behold it flowing into large deep water-line troughs, as it were, careering silently on a smooth bed adown the mountain height, until broadening and free they serenely glide into their great earthly sea.

The hue of young trees becomes of somewhat soft invisible sea-green or delicate bloomy tint, but when the venerable foliage ripens into its golden age of glory, becomes yellowish-green. From noting the foliage in a general way, if more closely inspected, the leaves are awl-pointed and boat-keeled on the back, lapping one over the other in a scale-like way, loosely, as it were, alternating or spirally in four rows, and so passing around the ultimate sprays. Flowers on the tips of twigs, tiny pollen ones globoid. When cone-bearing forests are in bloom, the gentle rolling breezes waft the golden or yellow-folded clouds of pollen everywhere among the trees, or in this genus and firs, lighter or spirited aloft, the pollen-clouds drift along high up over common tree tops; nor have firs any fruit save on their tip-tops. This sulphur-like dust is often carried by storms afar, and, precipitated by rains, marking margins of pools, foot-prints, and ruts of roads. Cones, egg-form, two by one and one half inches, thick shield scales, diamond-disked or obliquely trapezoidal, roughly puckered, the radiating wrinkles indrawn by the quilted center-point, laterally transverse ridged, the concealed part broadly wedge-shape, strongly persisting; seeds, three to five to each scale, slightly oblong or subrhombic circuloid, being obliquely wing-margined; the middle

body part narrowly wedge-like, often very short, pointed in the slightly notched end, which is apt to remind one of parsnip seed or the like.

Finally, in all due homage, do we accord to this Great First Born of the Forest, not only priority in time, but in degree of goodness as to quality, preëminence at nearly all points of view, and as to state—past, present, and to come—whether as to use, magnitude, dignity, elegance, or beauty, yielding the palm of our forests to *Sequoias*, for they are indeed the Great St. John Cedars that never grow old, are never decayed, nor ever diseased, and forever rallying in youthful vigor to repair their storm-lost crowns; never known to die a natural death—sylvan types of the immortals.

REDWOOD.

(*Sequoia sempervirens*.)

"For they sing to my heart,
And it sings to them evermore."

—J. P. Lowell.

TOWERING Redwood Trees, of most enormous proportions, sentineled our entrance of the Golden Gate in 1849. Alas! what wits it now to us whether they saw the vandals or the vandals them? Lofty landmarks, objects of intense interest, this great colossal and characteristic evergreen of the California coast! bold, nay awe-inspiring, grand and imposing, herculean pillars of the heavens, from out whose blue vault they looked abroad o'er land and sea, high above the hill-tops beyond the bay.

Of the same genus as the Giant Washington Cypress, of world-renowned fame, of nearly equal height—two hundred to three hundred feet, fifteen to twenty feet in diameter (rarely more), and usually seventy-five to one hundred feet or more of clean trunk, only second to *Sequoia* of Sierra—attains to thousands of years of age, and what is even more marvelous, these monstrous stumps still maintain their vitality. Trees of all sizes and to the extremest age, when cut down forthwith shoot up unnumbered saplings of great vigor and exceeding rapidity of growth; continued repetition, at brief intervals, only can kill them. The numerous branches are small and very short; indeed, relative to the size of the trunk, in age, quite insignificant; as it were, mere appendages. So intently devoted are they to the all absorbing timber-pro-

Sequoia

ducing purpose of their great sylvan colossus, this enables them to close their ranks and crowd the land with an immense amount of timber per acre, absolutely unparalleled.

Occasionally, when a social circle of these young saplings spring from the parent root, say within the usual area of fifteen to thirty feet or so, renewing their youth in such close proximity, two or more may unite to form one large tree.

Dr. Wm. P. Gibbons, J. Muir, myself, and others, have often seen the forested Philemon and Beaucis in lasting embrace, typically transmigrated, beneficent and happy still. Redwood foliage is like yew: the same flat and final starry spray or twiglets of small leaves, say one half to one inch long, distinctly in two rows, flat, line-like, with a sharp point, dark green above though not so shiningly varnished; underside soft grayish sea-green; tipped with young Spring growth of bright vivid yellow-green, then for beauty, they far surpass the gayest flowers and the prettiest ferns. More or less mixed

with the common foliage, are leaves reduced to scales; indeed, some trees are found in every grove with awl-pointed, scaly leaves, like the foliage of the Great Sequoia; but among the Redwoods these are exceptional and somewhat rare. The garland-like limbs are chiefly spreading, save in great age or tipped and drooping with male flowers like the Mammoth King, or pending tiny terminal cones of an oblong shape, one to one and one fourth inches long and one half to three fourths of an inch thick, consisting of numerous trapezoidal disked scales, thickly and roughly implaited by the indrawn or quilted-like center; its very sharp prickly point turned forwards or pressed down and looking outwards; the shield-like disk more or less distinctly marked by a sharp laterally transverse ridge, stem of the scale stout, persisting, compressed, broadly-wedged form with some sharp angles, covered and stained by a dark purple, almost black, shining, fragile, and granular secretion, like gum Catechu. Seeds, three to five to each scale, flat, oval, or obovate in outline, lateral wings very narrow or slightly and often obliquely margined, color dark reddish-brown, only a little notched at the outer and larger end, and shaped like parsnip or other similar seeds.

Redwoods abound chiefly, if not entirely, on sandstone soil—light, loose, black, or ashy—and always in the track, and confined to the fog limits of the coast, say fifteen to thirty miles inland, and probably never exceed forty or fifty miles, even in the most favorable low coast ranges where the fog passes over low lands or through open gaps. These mighty majestic redwood wands possess a magic power over passing fogs, wontedly precipitating them in showers of rain at their feet—for this, mainly, among many other good reasons, living springs of the purest water ever bubble and babble at

their bidding—choice guards, as they undoubtedly are, stationed around springs and water supplies, they are, for this very reason, all the poorer roadside or more intimate rural companions. The continual timber supply capacity of a redwood forest, under judicious care, is so prodigious as to be simply incalculable; none but a suicidal and utterly abandoned infanticidal policy, wantonly and untiringly practiced, can ever blot them out.

line
The timber is red, with a faint coppery or metallic iridescent gloss. [Choice curl-grained wood is very ornamental for cabinet finishing and similar work—takes a fine polish, simply stained or varnished, it is far preferable to any paint; the hues deepen to richer darker shades with age. Well matured heart-wood of the base of these trees is so solid and heavy as to sink in water, i. e. for a few saw-log "first cuts," as the log-men express it; these will last for ages, under the most trying circumstances, like cedars and yews. The upper part of the same tree, on the contrary, is soft, exceedingly light, though of like fine grain, only more brittle, but insects seem never to trouble any of it.] It is a great, and certainly too common error, to choose timber by name rather than by selecting the proper quality. During our earthquake experiences we had occasion to examine many walls, all alike laid upon redwood plank, in the lower made portion of the San Francisco city front. Some foundations, of just the same age, were apparently nearly as perishable as poplar, while others were as solid as so much cypress or cedar. Seasoning alone, important as that is, like age for wine, will never make the originally poor good.

disturb
Probably, from a fair estimate of the redwood forests along our coast, it would not comprise much more than about three thousand square miles of timbered land. The already extinct and too scattered portions are ignored in this estimate. This Coast Range timber belt extends from the northern portion of the State south to San Luis Obispo. Access to tide water, great economic value, and universal use, have, altogether, doomed these mammoth cedars to a speedy destruction.

use
The bark, reduced to bast, has been utilized for upholstering—an excellent material. The woodman covers his corduroy swamp passes and bridges with this very superior and imperishable material.

FRINGE-CONE SILVER FIR.

(Abies [Picea] bracteata.)

“The groves were God’s first temples.”—Bryant.

THIS exceedingly elegant steeple-shaped Fringe-Cone Fir is of the most extraordinary aspiring beauty, and quite unlike any other silver fir of the Pacific. The general outline approaches that of the White Spruce (*Picea* [*Abies*] *alba*) in its best types, simulating the form but not the habit of the Lombardy poplar, for the short limbs of this merely strictly shaped tree are not upright, as in that—the Oriental Cypress (*C. Sempervirens*) and Irish Yew (*Var. fastigiata* of *T. baccata*)—but the lower branches, from horizontal at least, are often bent back in the usual typical tented style of the spiry spruces; although the limbs above the middle and near the summit are mostly horizontal or spreading, and very slender, yet exceedingly tough and reliable even when long dead—arranged in whirls; but there is scarcely strength in the main leader body of the very tender long attenuated top to make it at all safe to climb to the cones, which, as in all the firs, sit upright, like birds upon the branches; and if neither apparently, with figure and metaphor, nor actually fringed with a crown of gold, yet the fruit is worth many times its weight in gold, so exceedingly scarce and valuable is it esteemed.

This invaluable, rare, and hitherto little known fir, rises from one to two hundred feet high, and from two to four feet in diameter; trunk as trim and straight as an arrow, but full of knots that extend well to the center; branching so low, it furnishes little or no proper lumber, but is a perfect pattern of sylvan perfection on the symmetrical plan. Arctic or Alpine trees of this extremely attenuated type—the slender parts are frequently broken in outline by the severity of their clime, and hence exhibit more variety, often bordering upon the fantastic—but these are so sheltered by the deep gorges in which they grow, and being so thickly branched below, as well as throughout, and clad in a light green dress of silvery sheened foliage nearly or quite to the feet, gives them the most exquisitely delicate and elegantly feminine expression it is possible to conceive. Besides the modest plumy-fringed cones, evanishing up in the blue amid a kind of gossamery webby haze, is eminently pleasing; the foliage is gemmed with golden drops of gum, that glitter in the sunlight like

radiant beaded jewels, thus sparkling all over, from crown to foot, with gold and dewy diamonds, contribute no little to effective beauty and to more oriental ornamentation of this fringe fir. According to our taste, this is the loveliest of California's silver firs—most ornamental, most valuable—but it is only a half-hardy tree, not well suited to great extremes of temperature nor exposure to violent winds. So far as we know, this fir is only found on the Santa Lucia Mountains, latitude thirty-six of Southern California, altitude from four to six thousand feet.

Not being likely to confound this fir with any other, our excuse for a brief specific note, is its rarity: Buds large and pointed, leaves from two to three inches long, line-like, entire, flat, rigid, sharp pointed, varnished green, and no breathing pores above; one half twisted at the base and in two rows; two silvery gray lines below, cones egg-shaped, four inches long by two to two and one half inches thick; scales smooth unlike any other fir, roundish kidney form, the narrow wedge-like claws short, falls off tardily from the fixed axis, the hidden part of the protruding bract, wedged, rigid, leathery, three-toothed at the top and these teeth again finely subtoothed, whole-form short and roundish; the straw-like mid-ribs stick far out from between the scales from one to one and one half inches, and spreading or gently recurving they loosely fringe the whole surface of the cone and are beaded with turpentine; seeds oblong, wedge-shaped, four sided, skin light leaden gray, wings slightly obversely egg-form, of membrane-like texture, entire, flat, and thin.

THE GRAND SILVER FIR.

(*Abies [Picea] grandis.*)

"Rose the firs with cones (like birds) upon them."—*Longfellow.*

THE perfect elegance of this trim lofty silver fir is greatly enhanced by the relatively small diameter of the body. A tree may be from two to three hundred feet high and the trunk barely four to eight feet in diameter, with a marvelously clean shaft from eighty to one hundred, or even one hundred and forty to one hundred and fifty feet, as even and true as if laid off by line. The firs of this vicinity, say on the coast within one hundred miles or so of San Francisco, average one hundred and sixty feet high by two to three feet in diameter, although a few reach two hundred, by six to

eight feet through. The distance to the first branches, thence towering to the at length conic or flat top, seems much greater than it actually is, since they scarcely approximate what we are accustomed to consider colossal, but rather the columnar type. These lofty columnar and towering traits of Pacific trees are more characteristic of these far western forests than of the same species under culture. This fir is sometimes of singularly slow growth, in its early state, as are also some of the spruces, and again other trees increase rapidly from the very first start up to maturity, which, for the coast here, is between one and two hundred years—after one hundred and fifty to one hundred and seventy-five years the growth is barely nominal. As an example of the former early, nearly *tacit statu quo* state, say for forty years, the rate of increase may not be even one quarter of an inch in ten years for the whole period or more, if much stunted in the start. Of the latter the rate is exactly reversed, the rate of increase then being one and one half to three inches in every ten years for the first forty years, and the exceedingly fine decadent annual rings, instead of being at the heart as before, are seen next to the bark. This rate is to be esteemed as very variable, for some of these firs, at their most southern limit on the coast, will even occasionally make one inch thick of annual ring-growth. In thus laying down these extremes of illustrative variation, we are cautioned lest we generalize on too scanty data or too limited observation; nevertheless, we feel warranted in saying that, as a general rule, firs are of rapid growth—and allowing that they may live a few hundred years—yet they are what we should designate as short-lived trees.

The branches of the Grand Silver Fir of the coast here never pend, but maintain a perfectly horizontal position, in age the top becoming reluctantly squared or flat topped. The bark grayish brown, rather thin, two inches or so for trees three to six feet through, brittle, and not much roughened; the silvered foliage deepening to dark green towards the top, and at the crown quite dark hued. The leaves, as Dr. Englemann observes, are glossy green above and without stomate; two well marked white bands below, each consisting of seven to ten rows under a strong glass, one to two inches long, more markedly distichous (two rowed, one on this side and the other on that, or opposite sides of the twigs), at least in the sterile branchlets, than most other silver firs; strongly grooved and the end notched, leaves on the fertile branchlets similar but rather shorter, and occasionally rounded at the tip; leaf-scars rounded or circular, not elevated. The cones, as usual in firs, on the topmost boughs of the tree, set upright, like birds upon the branches; cylindrical, three to four and one half inches long (seldom longer),

about one and one half in diameter, obtuse, often with short titted center, from the somewhat more depressed or retracted surrounding, and still rarer abruptly acute, when broken off the based portion, like *A. Concolor* (?), deeply cupped by the much bent scales and seeds, dull velvety greenish or parrot-bronze tinge; scales one quarter broader than long, the outer air margin of the segment of a rather smaller circle than its very close kin, *Concolor* (perhaps only a variety); bracts under each scale short and included, or hid in the cone; this is oblong, obcordate, finely cut-toothed on the end and sides, mostly the central sinus or notch with a rather long lance-pointed mucro; this thin appendage beneath scales, it will be noticed, is narrowed below or wedge-shaped; seeds with an American ax-like wing, about as broad as long, ripening in November, or farther north a month earlier. The wood is white and soft, when well seasoned makes the best of stiff strong girths, etc.; holds nails remarkably well; makes good inside work when protected from the weather, but is very perishable when exposed. It is held, however, in little repute by lumbermen as yet. This is the white fir of Oregon—from beyond the Cascades of the Columbia River to the Pacific Ocean, and from Frazer's River to Vancouver Island.

Trees felled and left in contact with the earth, and so exposed to the seasons, will utterly perish so as to be stamped to powder under the heel of one's boot, in five or six years. At its southern limits it seldom fruits, and the few cones found seldom or never produce good seed.

A lofty tree, most aptly named for its most superb grandeur and beauty, worthy of all care and culture, the finished columnar shaft losing its slender lower limbs, for lack of light and air, very early in the native forest; rising almost palm-like in its exaltation, crowned with short cone, or flattish like the pine or quite as the cedars of Lebanon, but with no great spread, and elegant smoothish or fissures shallow and openly spread, and thin, iron-gray bark, silver-lined foliage; fruit, as it were, brazen plumaged birds perched upon the topmost boughs, and you have a sylvan object of ever increasing delight to the beholder. The sapwood is about in the ratio of one ninth the diameter, and requires from thirty to fifty years to ripen into heart-wood, with due allowance for variability of growth.

In describing trees, some allowance must be made for what is called the "habitat," etc. A few general remarks may be allowed in this connection, to illustrate this principle: Take, as an example, the leaves. Now suppose an author to say of them, "more markedly two-rowed." To test the absolute value of this and similar manifest usual characteristics, upon which we are apt to rely, let us choose a similar case, unquestioned, as a standard of comparison. Let that be the Pacific

Hemlock Spruce (*Tsuga* [*Abies*] *Mertensiana*), which also grows in the same localities as the above *grandis*, both at their hotter southern limits, say one hundred miles north of San Francisco. Here both become more distinctly, nay, strictly, two-rowed (distichous). This Merten's Spruce or Western Pacific Hemlock, north to British Columbia, has densely crowded leaves distributed more or less all around the twiglets, and the leaves are therefore exceedingly dense *there*, yet it becomes *here* perfectly two-rowed, shorter, and sparser, etc.—is, indeed, the airiest and gauziest of all gauzy trees ever seen. As with spruce, so with fir—*grandis* thickens towards the colder coast and mountains north—hence the variety *densifolia*; but if this is deemed a good variety because denser foliaged, then, by parity of reasoning, from similar local characteristics, we must also have a variety of Pacific hemlock spruce, and also varieties of varieties, and so on to the end of the chapter.

As qualities of timber, etc., sometimes also follow these diversified forms, it may be useful to designate many varieties, as woodmen and workmen are in the habit of doing, for their own convenience and use; and, as science has the same end, so, at length, also scientifically refined discriminations ever keep pace with the most thorough knowledge, and are useful so long as they do not transcend the practicable.

GREAT WHITE SILVER FIR.

(*Abies* [*Picea*] *concolor*.)

"Here spiry firs extend their lengthened ranks—
There violets blossom on the sunny banks."—*Fawkes*.

AMONG the most stately, elegant, and useful firs of the Pacific, with respect to all points of estimation, certainly none excel the white fir of the mountains. The cheerful contrast of light bark of body and limbs, as the eye catches glimpses of them here and there from beneath the soft starry mantle of living green, recalls virgin linen, white and clean, gleaming aloft from out the exalted spires of "God's first temples"—the primeval groves.

In its young state, this fir is half-spire form, the whirled branches spreading horizontally as do branchlets and final sprays, forming flattened fan-like distributions; the line-like leaves in two regular rows, one on this side and the other that of the twigs, as it were, winged; the pinnæ leaves usually notched at the end, two to two and one half and sometimes

three inches long, indeed longer than any other Pacific fir. Rather gray-green, stomata-breathing pores, confined to the middle line but never absent; in older trees the lower limbs only have notched leaves—this last feature, however, is not specific and peculiar if more common; higher, they are then shorter, broader, rounded above, ends blunt or very short, sharpened; on flowering and fruiting branchlets they even become keeled above and almost quadrangular—stomata cover the entire upper surface, and they are not then so strictly two-rowed.

The White Silver Fir is a tree from two to three hundred feet high, usually four to eight feet in diameter, often with a neat naked shaft from fifty to one hundred feet or more; top always more pyramidal even in age than the great magnificent Red Fir (*A. [Picea] magnifica*), probably only another form of *nobilis*, with its colossal dark cinnamon-red body or bark. Found in the California sierras up to seven thousand feet altitude, the most eminently prosperous belt of the best timber lies between four thousand and four thousand five hundred feet of western and northwestern exposures (for present purposes we omit its Rocky Mountain, New Mexico, and Utah ranges east, or Oregon); at least here the timber is never as good above or below the above mentioned limits, nor, if lacking in any one of the best suited conditions—all of which we do not pretend to notice—as average temperature, rainfall, and the like.

Messrs. Toll Brothers, of Dutch Flat, have tried stringers for horse-tramways, three by six inches—half in earth, half in air, the alternate wet and dry test—some of spruce, sugar-pine, yellow or heavy pine, redwood, and white fir, among these, all tried in the same locality and at the same time, this White Silver Fir outlasted them all. We examined these, and were it not manifest from many experiments, we should hardly have anticipated it superior to our Pitch Pine (*P. Ponderosa*). Dr. Parry informs me that a like reputation holds good, in that where it is preferred for railroad ties, etc. This fir does not warp like spruce, red fir, or Jeffrey's Owen's Valley variety of *P. Ponderosa*, with their marvelous efforts to get away from fences, etc. It makes choice ceilings, shrinks least of all, and takes less paint than any other lumber, as it abounds in (tannic?) acid. Spikes and nails never loosen in the lumber as in other timbers, so that as entire or half-earth sleepers, outside or inside work, it may be well commended. Another point, it should be remarked is, that the wood is not too hard to work, but soft in the region named, nor is the grain unsightly and coarse like spruce; besides, it is famous as the stiffest, strongest mountain timber, both for transverse horizontal strain and crushing perpendicular pressure, hence its far-famed esteem in mines, for bridges, and for strong

floors; for butter barrels, kegs, and boxes it is superior, as no taste or odor is communicated to the contents, besides staves for laths and the like; but for laths, Douglas and Merten's spruces are preferred.

Where so much confusion has hitherto existed as to species, one must expect somewhat particular details—perhaps unavoidably prozy—had not the quality, also, been so egregiously decried, like other timbers of the Pacific, a word of commendation might have been sufficient for passing estimation and briefer notes, that only seize some strong points of obvious and ready recognition.

Cones erect or perched upright upon the top branches, three to five inches long and one and one half inches or so in diameter, usually obtuse, clothed in a very close soft yellowish-green or velvety scum-greenish mantle of exceedingly short villi scales; separately examined, edgewise or side-viewed, the claw is bent at an obtuse angle so that the cone, when broken, the base portion presents a deep cup-like cavity or fracture; these scales very broad in proportion, appendages or bracts beneath short, slightly wedge-like, rounded, blunt, or sometimes notched at the end, a sharp point from the center, wing of the seed broad American ax-shaped, or often as wide as long, if not wider, and so on. The most obvious marks are the ashy-gray body below in age, and always the white color of the body and branchlets above; the foliage pale blooming or of light gray-green tint.

THE NOBLE SILVER FIR.

(*Abies [Picea] nobilis*.)

AND ITS MAGNIFICENT VARIETY: *A. MAGNIFICA*.

"When the bright sunset fills
The silver woods with light."—*Longfellow*.

AMONG the most stately trees of the world stands the Noble Silver Fir of the far west—one of the truest types of nature's noblemen—towered and terraced to the skies, aloft on the high mountains from six to eight thousand feet altitude, or more; attaining from two to three hundred feet in height and five to ten feet in diameter; bark of the grand trunk dark cinnamon-red or burnt carmine color.

"Abroad their fan-like branches grew,
And, where the sunshine darted through,
Spread a vapor soft and blue,
In long and sloping lines."

Thickly mantled in light and ever-living green, softly silver-lined, the grand horizoned round-tables of velvety verdure, rising series above series, the branches only lessening their ample area near the summit, strikes the eye of the stranger with amazement at the marvelous majestic port and perfect elegance of symmetrical beauty. To the appreciative eye, this noble fir is instinct with the air of magnanimity and frankness, suggestive of the bluntness of honest candor and altogether expressive of natural good nature, as we sometimes see where truth springs from a generous ground of good, with manifest laudable purpose. Its language, indeed, is manifold: listening with ears, seeing with eyes, or singing as every bird sings, as the proverb saith, according to its own bill, one may at least earnestly commend this noble sylvan glory to the high consideration and enthusiastic praise of the choicer songs, for none can ever cease to admire the Noble Silver Fir.

Our detailed notice of this typical tree will be brief, in view of a fuller description of the more common variety of *Magnifica*. From Mount Shasta south, along the Sierras to King's River, we have seen and collected specimens of the cones, with protruding bracts; indeed, in some places they appear to be the rule, in others exceptions, but these cones were only very imperfectly covered—unlike the *nobilis* sketched and painted for Dr. Newberry. (See Vol. VI U. S. R. R. Repts., page 50.) There are many points of contrast and comparison of more interest to the scientific than to the general reader.

The leaves of the fertile branches are shorter, flat-quadrangular, thickness not more than one half or nearly two thirds the width, upwardly curved but not twisted, thickly set close all round. Cones set, like birds upright, upon the very short top branches, five to six inches long or high (or even more), two to three inches in diameter, usually cylindroid-ovate, nearly mantled by protruding bracts, bent back and so thickly set and closely pressed as often to nearly hide the scales; the outer part broad, rounded, or heart-form; end either fringed or cut-toothed, the middle awl-shaped, point elongated. These tonguey bracts or scaly appendages, it is claimed, never become shorter than the proper cone scales, or so as to be hid from outside view. Seeds oblong or rather obliquely subtrianguloid, base wedge-form, pale shining or clayey hue, like the wings, cotyledons seven or eight. This great Red Silver Fir, of Northern California, forms large forests about the base of Mount Shasta, at from six to eight thousand feet altitude, and said to extend north through the Cascade Mountains to the Columbia.

MAGNIFICENT RED SILVER FIR.

(Abies [Picea] nobilis var. Magnifica.)

"The fir grove murmurs with a sea-like sound."—W.

THIS most magnificent cinnamon-bark silver fir of the Sierras—their valleys or inter-valles, steppes, meadow margins, or contiguous to cliffs of the ragged rocks—is by far the largest and most stately of all the firs. Found at an altitude of seven thousand to a little above nine thousand feet; attains from two to three hundred feet in height, ten to twelve feet in diameter, and is even reported fourteen feet. In its glory we behold the massive towery and somewhat rounded or domed *sequoian* summit; indeed its general port is even of more densely thickened outline than those giants of our Alps. The mass of this foliage is made up of formal, well defined, round table-like terraces, as in the typical *nobilis*; like branching, more or less in successive flights to the top, yet sufficiently broken, here and there, to preserve variety and still suggestively hold the mind to ideal order, dignity, and grandeur, the most imposing, the most magnificent. These innumerable segments of circles, silver-lined and banded above, that deeply naps the ample folds of this broad mantle of sylvan magnificence, are but multiplied lines of regal beauty, perfection, and symmetry. The earlier state of growth does not greatly vary from that of age, but rather foreshadows it; the form then is one of perfect regularity, on the precise conical plan, from a broad base by lessening turreted series of branches, whirling aloft to the conic or at length sub-conic top, tipped by a strong straight rigid leader shoot of vigorous growth. Perhaps this would prove too formal for the eye to dwell upon alone, but in nature they are never alone, nor in forests of their own. This strict outline is more bold, viewed in midday among the mountains. It then and there stands in striking relief against the usual rugged background of rocks and awe-inspiring alpine cliffs, and seems more harmoniously combined, complemented, and in due keeping with high mountain scenery. Yet, as a single object or within a restricted circle, it is much more softened and silvered from beneath by the nightly camp-fire, or when naturally crimson-fired by rising and setting suns. When thus aglow, diversified by other sylvan surroundings, the picture is one of surpassingly softened beauty—fascinating quite beyond description; the very warm glowing bark of body and boughs, always lovely,

now more radiantly reflective than ever, reminds us of that other "fir tree set in the desert of the deserted"—sacred emblem of perceptive scientific truth of a superior order. As the wind-waves leave their own beautiful rippling records on the highland sands, so do the water-waves theirs along the shore; they also sing a similar song, the emblematic significance of which is nearly alike the same, for saith not the poet truly?

"The fir grove murmurs with a sea-like sound."

Hence it is that hearts nicely attuned to nature's harmony in the great forestal variety, full oft catch the grand orchestral chant that swells sublime in the mountain heights or sweetly dies along the gale, and even the tacit echoes from some far off song, perchance, comes softly swelling on the listening ear when a still small voice of silence is all about—above, below—and not a leaf astir among the boughs.

As for the serener haunts of the hermit mountain bird and the merry pine squirrel, the fir trees are their house—a velvety bed and board forever spread in silvered emerald. The beams of these temples are as the goodly cedars, and their rafters of fir, decked in gold and royal purple pillars, as it were, of the heaven's tent and table, silver-lined, balsam-perfumed, their airs are pure and sweet as the breath of lilies. Lordly shadows and secure shelters are they, where the weary pilgrim is wont to rest or repose in Eden sleep, on a virgin bed of boughs.

Dr. Englemann remarks: "Leaves of the young tree flat, scarcely grooved, never, I believe, notched; fibrous bundles in twos. On full grown trees, and especially on fertile branches, the leaves are one fourth wider than thick, or even perfectly square; the resin-ducts in these leaves, placed equidistant from the edges and keel, separated from the epidermis by a layer of hypoderm cells, externally indicated by a green stripe dividing the bands of stomata, so that these leaves show four lower white bands. Cones six to eight inches long, two and one half to three and one quarter thick, purple; bracts lanceolate, shorter than the broad scale, wing of the slender seed very oblique, wider than long; the only seed examined had ten cotyledons." The scales flat and set horizontally or not bent, so as to cup the cone.

The texture of the timber apparently like cedar—darker heart; makes excellent firewood; has been accredited valuable by some writers, but we have no personal experience or observation of its applied utility; said to have been extensively used in some localities, but from our observation of fallen trees in the forest it seems to us liable to speedy decay when left exposed to the weather.

PACIFIC SILVER SPRUCE.

(Tsuga Pattoniana [Abies Williamsonii].)

"Far off, indistinct, as of wave, or wind in the forest."—L.

THE Silver Spruce,* as its common name *par excellence* suggests, is by far the most cheerily silvery of all the conifers of the Pacific. The early growth of this species, as seen in the high sierras, say from seven thousand five hundred to ten thousand feet altitude in California, or six thousand feet in Oregon, is elegantly spiry, branching broadcast from the base, often in a decumbently ascending direction, at length outwardly pending tips, and so tapering aloft to the plummy top. The crowded wealth of fasciculoid foliage waves and surges the spray with such wonderful variety that its outline reflects the silvery lights and shadows to the greatest possible advantage. The weight of wintry snows often gracefully curve the base adown the steeps where they cling, thence righting up their recoil, the top compensates by an opposite curve thus gracing this impress of an early life-struggle for existence by another charm—a crowning wreath on the brow of victory.

The middle sized cones are perfectly symmetrical and smooth, subelliptically cylindroid, from two to three inches long, about three quarters of an inch broad, purple and softly bloom-tinted, they tip singly or in clusters the slender twigs; thus bowing to their weighty burden, they strike you as exquisitely ornamental. These slender branchlets are pubescent, leaves from one half to an inch long, convex or keeled, *i. e.* angled above, rather sharp pointed, narrowed at base and curved, stomatoes on both sides; male flowers about two lines long, on slender thready stems; pollen grains bilobed, blooming in September and October; seeds two and one half lines long, wing about one quarter of an inch, or less than

* The name "spruce," as contradistinguished from "fir," in common parlance, implies that the cones pend gracefully down from the tips of the twigs and are distributed over all parts of the tree instead of the top only; and that the scales and their appendages persistently hold together and fall off at once, when ripe, like many pine cones; also, that when the flat two-sided and two-rowed leaves fall off they leave the sharp woody-like base or foot stalk prominent, and no spirally arranged bark-scars as in firs and pines; and as the cones do not stand upright, like birds upon the upper boughs, near the top, and fall to pieces at maturity, of course they leave no naked spinello-shaped woody axis still perched on the place where they grew as the firs do, and the bark never blisters in spruces. In thus defining these common names, as they are and should be used by us, only a few strong points of contrast can be wisely noted—others more technical are intentionally omitted.

twice the seed, obliquely obovate and widest above. Many of these trees in the closer forests are tall and slender, from seventy-five to one hundred feet or more in height, often irregularly branched, but they are always graceful and never formal. On open borders, with greater freedom for development, they are both grand and graceful—the finest of all the spruces. The sturdy, elegant trunk, of rather even reddish-brown bark, reminds one of the sugar pine; column often clean from fifty to one hundred feet, and six to eight feet or more in diameter, thence above branching into a broadened conic top, duly balanced to lines of beauty up to one hundred and fifty or even two hundred feet. The best types we have witnessed are at the summit of the Sierra Nevada Mountains, which certainly seemed, to our enchanted view, as though they must be, for their style of beauty, equal to any spruce in the known world.

The special form and analytic illustrative figures in Vol. VI of the U. S. R. R. Reports, are our own paintings. That portion, however, showing the reflexed condition of the scales is superadded to the original drawing and is not characteristic. This condition of old cast off cones, exposed to a burning sun, is also common to other conifers, and is eminently conspicuous in the cones of the Western Mountain Weymouth Pine (*P. Monticola*), etc.—we simply note the fact in passing. Typically, this tree is pyramidal, one hundred to one hundred and fifty feet high and from two to four feet through; but in high altitudes of California, say eight thousand to ten thousand feet, is often only a shrub. In the north latitude of the Cascades to near Crescent City, it comes down almost to the coast in due form.

DOUGLAS SPRUCE.

(*Pseudo-Tsuga* [*Abies*] *Douglasii*.)

"There is a quiet spirit in these woods."—*Longfellow*.

DOUGLAS SPRUCE is found in great abundance in California and Oregon—from coast to Rocky, Blue, and Sierra Mountains—but does not climb the higher and highest elevations, yet ranks among the grandest of the lofty and exceedingly beautiful trees of the Pacific. This is one of the first and best known trees of the far West; discovered by Menzies, at Nootka Sound in 1797, during the voyage of Vancouver, afterwards by Douglas and truly identified,

and in whose honor it received its final specific name. It has been well described and renamed by many authors up to the recent date of the last publication. This tree constitutes a large portion of the heavily wooded timber lands of the coast and lower sierra. A short time ago, on the Central Pacific Railroad, about three thousand feet altitude, were to be seen specimens about two hundred feet high, nine to ten feet in diameter, and some, fifteen feet. In closely crowded forests they are even higher, reaching three hundred feet. Here the trunk often forms a column straight as an arrow, with scarcely a branch for from one hundred to two hundred feet. Like most trees of dense forests, our conifers are colonaded and towered, so that it is rare to find trees spreading, or even well spired continuously from base to summit, as seen under cultivation. We notice, however, on the most broken coast, those species of spruces and firs that climb the tallest steep slopes suited to their habit, and are, least of all, liable to be shut off from abounding sunlight and air, are those that retain their branches long; a few such sentinels, outskirting the crowded plateau-forests, also, are found of exceeding great beauty; the branches from horizontal at length droop in graceful curves with ascending star-spangled sprays, and these in softened slightly silvery tips joyously upturned, like the bent bow on its back, wooing the hand of some primitive Nimrod; thus, in due order, multiplying and successively aspiring, feathery, and flossily thickened in with foliage of unwonted delicacy, and grace inimitable. And again, where we see them thriving luxuriously upon moderate mountain elevations of free outlook, favoring soil, sun, and aerial conditions most conducive—as upon the lower mountain ranges contiguous to the base of Mount Shasta—its intrinsic native grace is greatly heightened to one's beau ideal of princely elegance and beauty. Witness those most extraordinary streamer sprays, seventeen to eighteen feet long, of similar slender size of plumed curtain cords, drooping vertically, like the Bridal Veil Fall in Yosemite; or say, what could exceed the stately grandeur with such a softened and graceful flow of sylvan elegance as is displayed by this truly "Vernal Fall" of the forest? Nor is this exuberant sport all of the "witch knot" origin, of Scottish renown, but, like that of the Sitka Spruce, must chiefly spring from more highly enriched soils and favoring influences indicated.

The bark on older trees is dark brown, thick, coarse, and rough; water-ways deep, flaring, or gaping, often broken and confused, and the general longitudinal fissure plan so jumbled as to bewilder the eye. In veteran forests they are more or less charred by periodical fires—not always the wanton work of man—for we have seen, several times in a single season, the scathing fires of heaven, gleaming from clouds,

envelop lofty trees, hundreds of feet high, in one unbroken column of blaze, a perfect tower of fire, leaving the forest burning in its tracks months afterwards, or until the rainy season set in and stayed the raging. Strangers seeing many steeply-topped trees—spruces, firs, pines, and cypresses, especially in the young state—are apt to hastily infer this to be peculiar to California forests; whereas, we have really a greater number of flat heavy topped conifers than are seen in the Mississippi Valley.

This timber is exceedingly tough, rigid, and bearing great transverse strain, straight though coarse-grained; from the best localities, lasting; for long timbers of great strength, much sought after, *e. g.*, those very long mining pump-rods, sixty to two hundred feet long—in some cases two thousand four hundred feet or more long, the rod alone weighing many tons—counterbalanced by transverse walking-beams every two hundred feet or so; these solid timbers are about sixteen inches square. For bridges, frames, and strong rough work generally, of every kind, they are most superior.

For butter and similar boxes that require to be sweet and odorless, so as to communicate no taste or flavor to their contents, the wood is invaluable. It is the well established opinion of experienced lumbermen and miners, mechanics and farmers, that the timber is best within its middle belt, say three to four thousand feet altitude of northwestern and western exposures. Of course this altitude given is not absolute, but applies mainly to California from the north line of Mexico to Oregon. Besides other superior qualities, it may be noted this timber is not so hard to work, etc. In higher latitudes the isothermal lines dip lower towards the coast, and the average requisite temperature, rainfall, etc., accord the best conditions of vigorous growth. Lower down the mountains this tree is not at all equivocal. Far south the wood is red, more brittle, splits too easily, fails to hold the spike as good timber will, unrelentlessly; it is, however, said to be lasting. A tree so well known requires little detailed description. Suffice to say: The sprucey leaves are narrowly line-like, about one inch or so long, furrowed above, keeled below, margins smooth, recurved, and a little bluish-bloomy beneath; cones pendent from near the tips of twigs, long egg-form, nearly sharp pointed, three to five inches long or so, and about one or two inches in diameter; scales few, large, loose—but not shed off like firs—roundish, entire, and thin; the bracts above strap-like, projecting out beyond the scales lying along the surface and pointing towards the tip of the cone, ending in three points, of which the middle narrow one is the longest. Sabin describes the cones as erect, whereas they are pendent. Nuttall's figure represents the bracts reflexed; they are not so, but as we sketched them in Vol. VI U. S. R. R. Reports, page 34.

The recently discovered Large Cone (*Macrocarpa*) variety(?) of San Philipe Cañon, and elsewhere in the southern part of the State and to Arizona, perhaps requires more than mere enumeration. The form of this tree is rather more broadly conic, branches more horizontal, open, and airy in appearance, leaves longer; cones, scales, and seeds larger, etc. This large tree attains to one hundred feet or more high, five to six feet in diameter—quite as much diversity from the type as the restored *Pinus Jeffreyi* from the old *ponderosa*.

Woodmen and workers distinguish this one species into two kinds (or qualities?), Red Fir and Yellow Fir—the former with red, hard, brittle, and knotty heart or matured wood; singular enough, and contrary to the usual custom with other timbers, this heart-wood, by common consent, all reject as relatively worthless. The other kind has softer wood, with scarcely a feeble tinge of yellow; this is easier worked and highly valued, but deemed less lasting. Much more appropriate common names would be Red and Yellow Spruce.

MERTEN'S PACIFIC HEMLOCK SPRUCE.

(*Tsuga* [*Abies*] *Mertensiana*).

"O hemlock tree! O hemlock tree! how faithful are thy branches;
Green, not alone in Summer time,
But in Winter's frost and rime!

O hemlock tree! O hemlock tree! how faithful are thy branches!"
German of Longfellow.

VAST forests of this Pacific Hemlock extend along the coast from California to Alaska. Farther north it constitutes the main characteristic feature of the Pacific Sylva. This most charming tree of all the evergreens, from youth to prime, is of softened conic outline from dense broad ground-base, to light and airy leading tip; later on in life of spiry, stooplo-top attenuation of branch and stem, throughout richly mantled with the finest feminine delicacy of foliage, yet beautifully infilled with the most exquisite variety and grace by numerous hairy, slender, and pliant tiny little twiglets, feathered, here in California, with the briefest leaf and thinnest of all the fan-form horizontal expanse of spray known to these trees. This is even more spiry than the Eastern Canadian, and only rounded-conic when broken off by storms or far advanced in old age. These tall spruces, farther north, are clad in denser masses of darker green verdure—twigs of no longer strictly two-rowed foliage,

but semi-plumed with longer and more varying leaves clothe them from the base to from one to two hundred feet or more; body two to six or seldom eight feet in diameter; but here only sixty to seventy-five feet, and rarely over two feet through, and in sheltered twilight shades altogether more open, lighter green, and delicate soft grey-green or glaucous hue most manifest below, or shimmering in the breeze, such sensitive forms and foliage in the play of lights and shadows is spirit-like, fairy, and sportive in the highest degree. And then behold the bright enlivening contrast of lighter vivid citrined-green verdure of new and tender leaf, fringing the new-born spring tips, her dark mantle now adorned, as it were, with new floral ornaments, or rather apart from all illusion—infantile sprays of exquisite beauty; delicate and drooping, confiding and reliant as the innocent babe on the breast of the mother—never yet excelled by any object of decorative art, nor ever surpassed in the exhilarating and refreshing odors they exhale—the delight and gladness of youth, the joy of age—rejuvenating ethers to the enfeebled, traditional restorer of the invalid, grace of the grove, beauty of the lawn! The scattered branches long and slender, of about equal diameter three fourths their length, horizontal, or the lower drooping with the easy upward sweep and spring awaiting the wintry snows and storms north; here, perfectly level, and free as the toss of the zephyr itself. Bark of young trees and branches nearly smooth, gray, bloched with lichens; old trees, coarse, rough-furrowed, inclined to a dark shade of red, a very slight bruise, or the scarf removed, reveals a very brilliant bright pink-purple color. Cones pendant from the tips of very numerous slender hairy twiglets; scales about thirty, roundish and thin, slightly furred, included bract on the back of the scale, blunt; cones an inch or more in length, oblong cylinder-like, somewhat pointed; seeds (about two sixteenths of an inch long), about as long as width of the wing, and this three and one half times longer—a few nit-like glands on the lower side of the seed. The northern form has the usual decided spruce drooping habit, as before suggested; leaves more densely set, and even crowded, and so distributed more promiscuously on the upper side of twigs—or less strictly observant of the two-rowed character, for although spirally set, upon a short raised base, and this still left on when the leaves fall away—they usually so twist at the base as to appear two-rowed; line-like leaves, though variable, are often three quarters of an inch long, blunt, sap-green above, two lines of bloomy-gray beneath; usually preserves the dense low bowing branches from little above the ground, so on aloft, inclosing a neat warm open canopy within, by the lap and overlying boughs closing at their tops; this greatly serves to keep the brooded soil warm, for the roots

are shallow, and in Alaska rest on, and cling to, rocks with scarcely any appreciable soil at all, simply slop-holes of living and dead sphagnum—but here, altogether dry, only the roots reaching moisture—the sharply conic top at the same time serves to let in the sunlight and air to sweeten these woods. The thickened lower branches often so abound that much radiation and loss of heat is prevented in Winter and heat excluded in Summer—tempering the clime—besides, her foliage precipitates little moisture, unlike redwoods and their like, and as the snow melts soonest on her boughs, they bend down in the lean-to style of branch or center-pole and circle-tented. Viewed all round, it is manifest they shed their drip afar round about; this elegant sheltering foliage thickens deeper in or farther back, and multiplies itself amazingly. It not only divides and conquers the wind at the tips, but by successive subdividing sprigs, continually diverges and multifariously mingles the elemental strife, until all its force is fritted away, and the calmed air nestles quietly beneath her peaceful wings; therefore a lodge under these boughs is both warm and dry, fragrant and sweetly ventilated—indeed, constitutes that unsurpassed and ever-living sanitarium for the invalid to which we previously alluded. Camping out and sleeping on these boughs has a north continental reputation for restoring and rejuvenating, accordant with Norwegian and Swedish traditions and customs, where, once a week, the floor must needs be strewn with twigs of spruce or juniper tops. Is it any wonder these refreshing odors inspire the social home-circles with all the rural virtues that adorn these—

“Lovely bowers of *innocence* and ease,
 Seats of my youth, when every sport could please;
 How oft I’ve listened o’er thy green,
 Where humble happiness endeared each scene!”

And where this old *sylvan nurse* reached her long arms out and took us by the hand, and we self-sufficiently climbed her arms, and, with loud echoing glee, sported among the entanglings; or, with dignified importance of great business in hand, selected the choice bough for the cross-bow, or more primeval bow and arrow of the native. It is noteworthy how admirably this tree rallies and thickens in the top when broken off by the tempest—which full oft takes the conceit out of its too ardent aspirations—nature’s testimony that it bears training to any reasonable extent, responsive to the bidding of the master; one of the best shelter trees known, wherever it will flourish at all, whether for the orchard, garden, yards, or for game of all sorts.

In our native wild woods, the cattle and beasts of the forest and field, and the fowls of heaven, find shelter under her

shadow; the grouse, the squirrel, the jay and their like, find a constant home in the more darkened head—genial tent-house when storm and tempest roar, secure hiding place from alarm and danger, and ever present night retreat to hosts unnumbered, with the sweetest songsters of the grove.

To dwell on the vast and varied uses at length would carry us too far in detail—a final word on the California form, its timber products, economic, and few other uses must suffice. Contrary to experience and observation relative to most other timbers, the old matured heart-wood is more perishable than the young and sappy poles and branches where they are exposed to the seasons—perhaps because less interstitial separation of annual growths or “shaky” texture with such ready absorption and retention of water, etc.—hence its almost sole devotion to internal work, securely sheltered from alternate storms and burning suns; for rude rafters, etc., duly seasoned with the bark on, they are singularly lasting and very elastic, with much of the snap and spring of the yew and cedar, combined with a due degree of strength.

Only in the coast forests of California, contiguous to rivers or cold creek banks at the southern limit of its growth, is the Pacific Hemlock Spruce ever found much over two feet in diameter and about sixty or eighty feet high. Up to extreme age it preserves the perfect symmetrical spire-form, and is altogether less marred by unsightly dead limbs, than its kindred of the East—the same observation applies to Alaska. Perhaps if this tree in our forests, or cultivated in this clime, were more exposed, a somewhat broader conic style would supervene; however, in its native haunts the horizontal, open, and airy branches, subdivided branchlets, and final feathery sprays have the utmost strictly two-rowed leafy plan, the tiny line-leaves about half shorter—certainly the most delicately gauzy, chaste, and beautiful tree it is possible to imagine. In the young state, say from ten to forty feet high or more, the bark is relatively smooth and even, branches exactly level, thin, fan-like, long and slender, with cherry-brown bark. These free hearted boughs from the breast, are wont to lose entirely the peaked Italian brigand-hat or Alpine style so common elsewhere, not even pending like tassels at the tips save when in young spring time, but toss their entire limbs as lightly and freely to the breeze as the wild deer leaps on the mountains; or, astirred by the gentler zephyr off some sun-set shore, vibrating the softest silvery emerald sheen, like a celestial thrill, close along the confines of the invisible, or dimly seen, so ennerved are the tiny leaves of this tree of our earthly paradise that no artistic grace of pencil, or power of pen, can express the charm of every exquisite form and enlivened motion, even to the very

minutest. Indeed, it is, in every way, the apt and recognized* emblem of juvenile *innocence* and early perceptivity.

The timber is well known the world over—chiefly, as noted, for internal work—this being tougher, seldom shaky, less pin-knotty, clearer and straighter-grained; makes good frames and floors, ceilings and laths; also, masts and spars, etc., although the Russians seem to prefer the Sitka Spruce (*Tsuga Sitkensis*); the bark is of wide repute for tanning; fibrous roots yield the strong thread and cordage for seines, nets, and for sewing or lashing the birch-bark canoe or boat of the native; the crude gum-like balsam smears and watertights the same—refined, it is the Burgundy Pitch of the apothecary, from whence come the renal and sciatica plasters—and the inner bark itself is also used for a sticking-plaster of much renown. From the tender twigs, or their extract, the wholesome spruce beer is still made, as in the days when we were young; a kind of oil, also like spirits of turpentine, and the lamp-black, scarcely inferior to any his sooty highness ever saw. In short, in medicine it has had and still holds a good reputation, as balsamic, sudorific, anti-rheumatic, tonic, etc., and for scrofula, even better than brake—equal the oak—and for unnumbered “ills that flesh is heir to.”

WESTERN WEYMOUTH MOUNTAIN PINE.

(*Pinus monticola*.)

* * * “Seemed an osprey,
Hovering above his prey—and yon tall pines,
Their tops half mantled in a snowy veil.”

THE Far Western Mountain Pine of the Pacific bears the strongest resemblance to the great Sugar Pine, of which it seems almost like a smaller variety of the same species (hence designated Little Sugar Pine). The general contour and expression of the tree is scarce at all like the White Pine (*P. strobus*) of the Eastern Atlantic; true, it has the common cone characters of the thin scaled *Strobus* section, and five-clustered needles as in Lambert's Sugar Pine also, but the port and form, as indicated, is as distinct as it well can be for one of the same subdivision of pines. Before the tree has attained to its true matured and distinctive type, it has the common closer form of many other spe-

* See Meehan's Obs. on the E. Hemlock; also, German literature.

cies, but at length, when of age, and aloft from seventy-five to one hundred, or sometimes one hundred and seventy-five feet high, and from two to five feet in diameter, in full bearing, its long horizontal branches well poised and nicely plumed with little laterals and closed around with faintly softened sea-green leaves, two and one half to three inches short; and then there is the selfsame free spread of the great Sugar Pine, only peculiar to these two species; the five-leaved clusters of needles are set close together in short fugacious boots, points sharp and edges keen, margins finely but remotely toothed, two sides channeled; the short but exceedingly slender foliage thrills very sensitively and delicately, the softer celestial echoes from off the blissful shores, to lull and soothe the sense to peace. Let other pines chaunt louder and grosser songs from their sylvan choirs where old Æolus dwells, these are of the higher angels who are wont to whisper their love notes low and still, as from the far away isles of the blest, soft as morning zephyrs gently roll the grain-clad dells. The form and size of the cones that cluster and tassel the tips of the branches are quite like those of the White Pine (sometimes called the Soft California White Pine)—oftener a little longer; herein the resemblance is nearly perfect, being alike on short stems, cylindroid, four to eight inches long, one to two thick, and stiffly curved; scales smooth, thin, loose, abrupt and mucro-pointed, but not prickly; seeds small, one fourth of an inch long or so, mottled or spattered with brown; wings from two to three times as long, widest near the middle, diagonally pointed, translucent-creamy, and more or less striped with brown; cotyledons, six to nine.

Contemplating these conifers, distant from their alpine eyrie, we behold the Great Sugar Pine stretching his wide wing-branches against the sky, like a vast sylvan condor soaring aloft high up over all contiguous trees; so, also, is seen this lesser Mountain Pine as a sylvan osprey sailing serenely o'er the mountains—tree-hawk of the hills, circumspecting the groves!

This soft pine of the Pacific is found sparsely distributed over the Sierra Nevada Mountains, at from four to eight or nine thousand feet altitude; timber similar to the white pine, but neither quite so white nor soft, and the texture somewhat tougher.

THE GREAT SUGAR PINE.

(Pinus Lambertiana.)

"Beneath the forest's skirt I rest—
Whose branching pines rise dark and high,
And hear the breezes of the west
Among the threaded foliage sigh."—*Bryant.*

ONE of the most magnificent pines the world ever saw is the Great Sugar Pine of California! From one hundred and fifty to three hundred feet high, ten to fifteen feet in diameter, the body remarkably elegant and even of surface; for the fine water-line ramæ only serve to smooth and soften the neutral-tint bark of this tallest priestly pine; and what a wonderful column! perfectly cylindrical, clean of branch or knot for hundreds of feet—usually two thirds of the total height—as it stands conspicuously in the midst of the forest, denized among other wildwoods, yet exalted above them; and high up over all his kindred pines, in some remote degree, like the lofty palm tree of the tropics. Among the trees, a mountaineer of the most decided and commanding character, his top in sylvan glory and radiating its open but exceedingly long arms, widely spread afar towards the horizon, oft as one vast long bow at ease, upwardly curving, exhilarant and free; and yet they are neither naked nor lank in the best types, but side-plumed and grandly fringed by relatively short, lateral, and successively diminishing branches and branchlets to their main extremity's end, whence pend from one to three, or even five, very long cones tasseling their tips, from one to one and one half feet long and three to five inches in diameter, suspended by stems four to five inches long; color of cone light cinnamon-brown or ripe-yellowish; thinnish scales loosely overlapped, oblong fan-form, without prickles, etc.; seeds oval, a little compressed, lines long, wings widest below the middle, obtuse; cotyledons, thirteen to fifteen.

These long horizontal limbs may depend somewhat, more or less in old age, like the bow still on its back, not altogether unstrung, but they are never massed nor at all crowded, but always open so as to allow the wind—of the prominent storm-exposed head—free passage through, or, in extreme cases, only bending them leeward almost double, like a true Damascus blade—hilt to point. This remarkable length of limb, so tolerant of the tempest and vigor of recoil with returning calm; or, in other words, toughened strength with elasticity, is quite characteristic.

The wild red man of the wood is quick to perceive and apt to apply this and similar knowledge to the science of his own use, for no sooner does the harvest of the coveted *pinon* arrive, than ape-like, he climbs and clammers out astride the branch, and, teetering to the required sway, when, with a short timely jerk, the heavy cones are snapped off. The great use of the seed as Indian food we omit.

The rich dark plumes of vigorous blue-green foliage very much resemble the beautiful White Pine of the East (*P. strobus*), especially when young—at length all further resemblance of form ceases. The needle-like leaf-straws are rather short, and somewhat twisted in age, from three to five inches long, very finely toothed on their edges, five in each tiny bootee, which at length is shed off like the White Pine; these little bundles, in most cone-bearers, are more manifestly inserted in spiral order around the ultimate twigs.

The timber is not quite so soft, light, and white as the White Pine itself, but closely resembles it, and is alike in use and value, and, in some respects, superior, as it combines greater strength with elasticity.

Where the surface is burned the oozing sap concretes into a white maunna-like sugar, sometimes nearly as crystalline and pure as refined loaf sugar, very sweet, with scarcely an appreciable pine-resin flavor—hence the common name Sugar Pine. If this could be obtained in quantity, its laxative and balsamic properties, apart from the palatable and nutritive, would highly commend itself to the attention of the medical profession. For obvious reasons, we cannot here, in all freedom, urge upon the public or the landscape artist the full claims of this expressive tree—to the bald scientific, or the mere lucre-loving plod, any æsthetic estimation of arboreal nature whatever might be deemed too poetic, imaginative, discursive, fanciful, or what not; briefly, irrelevant to the subject in hand. And what if we own no property in that royal realm, why shouldn't we be indifferent? And even our aversion may be suppressed. Is it not one of those occasions for tolerance, and charity, and all the renowned and universal virtues among men? With due deference, therefore, to these varied tastes—always to be anticipated—we frankly confess our great surprise that even some few are found disparaging this noble pine on account of its open-hearted port, nor in our fascinated simplicity did it ever occur that the lack of leafage was a defect in this unique type of trees, being in no way amenable to any gross, massive, or tumuloid standard of judgment; set it down, then, to our fault, that we have no preconceived, abstract, and arbitrary notion of propriety for all the trees!—that we do not even bow down and worship the almighty *Scissors*!! Perchance the peculiar charms of this tree in our eye, may,

to some extent, be borrowed from the striking contrast with other associated trees, for it is rarely in forests of its own, being mostly interspersed in all the Alpine, and some of the subalpine regions of the coast. To our taste, the Great Sugar Pine hath the far-extended oratorical gesture and open magnanimous spread from the breast and top of a tall and representative, or corresponding type of some sacred benediction of "good will towards men," for trees always display in their bearings types of human attributes.

On the table-lands of middle Yuba, a fair sample of a grove may be seen; indeed, almost anywhere in the common belt of about six thousand three hundred to seven thousand feet altitude; always excepting that peculiar medium coast-tempered belt that connects the Coast Range Mountains and Sierras, above and around the head of Sacramento Valley, where a few come down lower, in groups rather than groves, or very much more sparsely, where, also, they develop but few cones, comparatively, even in favorable fruitful seasons, and most of these, say two or more, become abortive, and it is well if even *one* of the number matures; besides, it should be noted the cones are smaller, yet always characteristic.

Found more or less in all parts of the State, namely, on the Sierras from three to eight thousand feet of both slopes, and a few in the highest points of the Coast Ranges from Santa Lucia Mountains to Humboldt County, and so on northward to the Columbia River.

Between the two forks of the Stanislaus River may be seen a tree three hundred feet high, and about fifteen or sixteen feet in diameter.

PARRY'S PINYON PINE.

(*Pinus Parryana*.)

"Mid the pine tents on the moon-lit mount,
Where silence sits to listen to the stars."—*Harvey*.

WE have more princely pines than this, which commemorates the indefatigable labors of our very worthy friend, Dr. C. C. Parry, but none of such exquisite beauty of symmetry, density of foliage, eminent use and rarest of all rare foreground trees for limited or lengthened landscapes. Mainly by its moderate size—from thirty to forty feet high by one half to one and a half feet in diameter—which greatly commends it to limited lawns and for rural residences, as most species of evergreen and deciduous

conifers are too colossal, or if lesser, too spreading for common purposes, being so liable to crowd contiguous trees and shrubbery out, for only a few, like *Chamaebatia foliolosa*, etc., thrive under their shade or drip; then, again, they prove too dark and monotonous, even when of requisite size for middle or foreground use; are sometimes of exceedingly slow growth, and do not well bear near approach and more critical inspection; above all, the light gray mealy-green or glaucous bloom of the leaves of this species is even more striking than the gray-gauzy Sabin or Large Nut Pine or the common Pinyon (*P. monophylla*), besides being of more rapid growth—bark light gray and smooth above, rougher below. Parry's Pine, in youth or prime, is rather steeply pyramidal, perfect in outline, compact in close foliage, but, judged only from trees of great age that have struggled desperately upon poor burning or bleak exposures of rocky ridges, they are reported with a round top, just as we see in those allied nut pines, cypresses, and similar trees, according to respective situations apart from their natural habit, which distorts and renders their forms, in a great degree, abnormal.

The timber is in great request where so little else is to be had, but the quality is not well known. The edible nuts are small, and hence others are preferred by the Indians. To them the pinyon is inestimable—a very feast of fat things; this is another of half a dozen or more nut pines. This is readily distinguished from Pinyons *par excellence* by the number of leaves in the little boots or sheaths. These needles or awl-like leaves are short, one and a quarter to two inches long, three to five in each bootee—usually four; cones somewhat globose, from one and a half to two inches thick, with strongly elevated knobs on the top of the scales; seeds oval, barely one half of an inch or less long, with a thin light-brown mottled shell; cotyledons, eight. Found only near the southern boundary of the State.

HEAVY YELLOW PINE.

(Pinus ponderosa.)

"There is a quiet poetic spirit here, amid
The silent majesty of these deep woods—
Its presence shall uplift thy thoughts from earth,
As to the sunshine and the pure bright air,
Their tops—the green trees lift."—*Longfellow.*

THE Yellow Ponderous Pine of California and Oregon covers vast areas of several thousands of miles in extent, from beyond the Columbia River to Mexico, and from Coast Range to Sierra Mountains, with the most magnificent forests, not only mixed with other pines, firs, spruces, and varied arborea, but still maintaining its prevailing character; it also often becomes the only species the traveler may meet for days together, especially in the arid and burning interior valleys and basins; and even here it is often a large tree, *i. e.* over one hundred feet high, suffering somewhat in the character of the lumber which then becomes softer, lighter, and is greatly given to an ungainly warping propensity that seems simply ridiculous, when posing to such extremes. Like most other trees, the quality of the timber is exceedingly variable, according to soils and surroundings. To illustrate and confirm this remark, we will state that a dwarf variety, or rather subvariety of *Jeffreyi*, in Owen's Valley, at "Casa Diablo," bearing cones, barely one half the usual size, within reach from the ground—the full grown trees but little higher than one's head—with glaucous sour foliage, of the taste of common rhubarb or sorrel. At first view, we took this remarkable example to be a new species of pine, but upon more close and careful examination, although growing upon exactly the same level and within a few stone-throws of typical trees over a hundred feet high, yet this dwarfed character seemed evidently due to the soil in which this particular group grew, being a saline deposit from a hot spring, forming a little knoll whence the mineral waters had receded in course of formation.

The ever increasing import of all our varied Pacific observations tends to impress upon us the vast significance of foundation soil—as to accelerative or depressive, qualitative or quantitative, and other influences, upon arboration, or the lesser and more general vegetation—many fingered facts point continually to the ultimate mineral and moraine as their great guiding genius; so the lesser mineral flows to the

lasts and leasts, æreal and ethereal; a thousand witnesses rapidly multiplying, crowd to the front, and clamor for recognition and application to human use, or to use and to humanity. The artificial dwarfing of trees by the Japanese—a former mystery, now generally known—practised by myself when a boy, viz: by the layering principle, modifiedly applied, from upon trees already very old, by partially and successively continuing to belt or girdle a twig while the limb is wound round by turf or moss with a suspended water drip until it strikes radicles, and then cut off and potted or planted. This pine, from one to three hundred feet high, and from three to eight feet in diameter, is, for nobility of port and lofty beauty, in the eye of the cultivated stranger, possessed of unusual interest; the finest forests are but little removed from the great *sequoias* themselves; this comparative contrast is most vividly brought home to one's consciousness by their often skirting, and as it were, guarding the regions round about them; nor is it always their grandeur alone that so impresses, for to be duly appreciated we must enter into the spirit of the tree itself, in various ways; must catch the silvery thrill that so nervously and finely trills over the long radiating tufts of steely needles that tip and aspergil the older beady-scarred boughs; and then there are those large long plumes of younger spire-topped trees, which are altogether alive to one who

"Loves the wind among the branches."

Though the palisaded pine trees—ever sighing—ever sighing as they softly gleam o'er the landscape, tinted, too, with the most delicate possible tinge of golden-green that glimmers a softer sheen over the sunlit hair—these coma almost hiding the clustered cones that tip the final twigs. The bark is peculiarly striking, of bright yellowish-brown, and of lamellated soft corky character and color, its surface laid off in large, flat, smooth plates, from four to ten inches long or so, one third to one half less broad; these oblong divisions, for the most part, follow the law of cell forms and forces combined, bounding the chinky water-lines, the leading channels of which are somewhat deepened below. The ease with which jaybirds and woodpeckers honeycomb their thimble-sized holes and drive in their winter supply of acorns, point or germ end foremost, renders the bark of these pines the preferred repositories; even bushels of acorns are sometimes seen so stored in a single tree. As the germ end is thus kept dry, and by pressure quite prevented from swelling, it cannot germinate, although some species are so prone to sprout they scarce wait until the fall to the ground and never long after—a hint to the wise is sufficient.

Although this Far Western Yellow Pine comes in second above Sabin's Gray Pine as we ascend the Sierras, and is very abundant and of the best types on the higher ranges, more especially east, yet it is also a Coast Range pine—in this latter region the cones are much smaller, seldom over three or four inches long by two to two and a half inches broad, and the brown seed, although rounder and not so sharp, is about the size of apple-seed; whereas, the *Jeffrey's* form (by some considered a good distinct species, certainly a quite characteristic variety for the culturist), found at middle and higher altitudes, has cones at least three or four times as large—from six to eight inches long by four to six broad—old straw beehive shape, and striped or variegated, seeds twice the size. Where transient mountain streams lave the roots, and perhaps other conditions favoring, the cones are often more elongated or not so strictly ovate-conic—this we take to be the *Beardsley* variation—and so others besides the extremes one sees beneath every tree, but the general resemblance of the several synonyms of the type is such that it may warrant their union into one species, even if we reckon them eminent and choice varieties. Some of these majestic trees, seventy-five to one hundred or one hundred and fifty feet high, are found with massive spreading branches of peculiar aspect, unwonted among pines; but for the most part this species is towering, lofty, and clean colonnaded below, hence its availability as timber for manifold economic uses. In a brief historic point of view, as connected with this pine, it may be well to note the import of those little basins or ring-ridges of sand so often seen encircling the base of these pines. It is the work of the Indian—designed to entrap and collect the fat luxurious worms that infest these trees—who, firing the straw on the still air of late Summer and early Autumn, the rising smoke among the boughs offending them, they let go, swinging down to the ground, whence they betake to the trees again, and, falling into these pits, their futile hold upon the treacherous sandy margin causing a continual backward tumble into the bottom of these shallow pits—thence the squaw gathers them into baskets for food—thus a double purpose is subserved: that also of cleaning the ground preparatory to the fall of seed.* In allusion to the pine, the

* As miles and miles of forest—not a tree less than two hundred feet or more high—may be summarily divested of their caterpillars simply by women and children, what shall we say of our own stupidity if we do not learn how, after seeing it done before our eyes? Now why not thus free our tiny patches of woodlands, fields, orchards, rural and municipal shades? With plenty of fire and smoke, men, women, and children, and a little civilized sense left yet! certainly none will say the plan is not practicable. But suppose it may not apply to all cases (none but an empiric would ever be foolish enough to think that, in the first place), nor to any, perhaps, if we scorn all insect lore (Entomology). Sneer at it as “bugology,” and its devotees as like “ologists.” Thus doing, certain and sure, old Prince Belzebub

native, in a metaphoric sense, often unwittingly bears the highest testimony to his great estimation—judging from their highly figurative style of speech, graphic force, great eloquence and pathos, of many tribes of North America. We say, judging from his choice of words and figures, his wild woods and high mountain home must have for him still much genuine poetic charm; perchance sounder significance than the pale-face is wont to perceive, akin to, if not the real relic, of a lost Eden of some celestial bygone. Take as an example the Chief Saginaw, when asked of his welfare and that of his family (two lovely daughters meanwhile having died), characteristically answered (pathetically breaking a long, fixed, statue-like gaze of silent retrospection): "Saginaw? Saginaw was once a tall pine among saplings of the forest! The pale-faces came and sold him fire-water; he became depraved; the Great Spirit's anger was kindled against him, and His lightning struck away his branches!" Long may they wave their fadeless banners aloft to the pure mountain breeze, and sing their sweet æolian spirit-song to entranced and fondly listening ears, soothing the soul to peace and to inner contemplation.

This Ponderous Pacific Pine is so called from its great weight, the timber being unusually heavy from its dense, generally resinous, often hard and brittle character, although, as before observed, softer and tougher in the middle Alpine belt of about six thousand feet or more. Wood usually yellowish, largely appropriated to mining, building in general, and for a great variety of useful purposes—among the best timbers of the Pacific.

This tree, like the Long-leaf Pine (*P. Australis*) of the south, to which it bears strong resemblance in general appearance, is rather more apt to be blown over by high winds than most other pines of this coast.

hath dominion over us, to our sorrow, and we shall wail to no purpose! Doth it not stand to plain common sense and reason, that even a savage must know their habits, times, and seasons? and should not his enlightened brother search more deeply still, into wider relations—perchance into the realm of causes? No empirical or quack nostrum alone is adequate to meet our ills and failures, like clear intelligent ends—like scientific knowledge, wisely applied to use. But the objector may say: "Suppose the land isn't sandy?" well, then make your little trenches shelving, or with a regiment of turkeys and a few other lesser native birds, the good All Father sends, none may be needed; indeed, a thousand considerations could be urged, which every man's own good sense can be trusted to apply. These observations are not irrelevant, neither are they discursive; no one thinks of treating trees, plants, or animals nowadays apart from their relations, for no man of sense can so think on any subject.

SABIN'S GRAY PINE.

(Pinus Sabiniana.)

"Pine trees waft through its chambers,
The odorous breath of their branches."
—Longfellow.

THIS medium sized, soft, sea-green, light, and airy pine, is the first seen as we approach the highlands, which, like a blue sylvan mist, sports itself here and there over the foothills in a manner so eminently pleasing to the eye. Being a first class foreground tree, where else should it be found so appropriately as on the foreground, or middle landscape, as we ascend the Sierra Nevada Mountains? and, if allowed to say it, we never behold her soft celestial wings without a genial glow of heart that, as it were, clasps the chaste charmer to our bosom—and why not? Is there the remotest semblance of prudish precision in the expression of this tree? Nay, but the whole air of it is as free, easy, and artless as any other child of nature, with only just enough of the erratic for grace and variety's sake, for the body is never, or rarely ever strict, but will swerve a little below, and must needs fork more or less variously above; usually dividing into two or more main, erect branches, that serve to divide if not dissipate any leading responsibility of head; and, as to timber body, there is not often much to speak of, therefore doth it spread and become gently open, and is not only of light gray-green hue, but loose and gauzy-foliaged, with long-haired leaves quite gossamery, like a lady's veil, that scarcely hides the beauty beyond, but lends distance to enchantment and relief to perspective. Still, lest the expression be altogether too light and too gauzy, the great cones are dark and striking objects, hung out in mid-air! speciously as big birds among the branches, or, recalling the allusion, they give it decided tone and character. Let us dwell a moment on these great cones—unequaled in the world at large, and only a little surpassed by the monster Coulter pine cone of the coast at home—eight or nine inches long by seven or eight inches in diameter. This alone is enough to excite the wonder of the native observer and astonish the stranger, and yet they are often in clusters of from three to five.

This particular nut-pine—for there are more than half a dozen others—can only be considered a tree of low or middle-sized stature, say about forty to sixty feet high, average diameter two or more feet—rarely a few seventy-five to one

hundred or more feet high by four or five feet in diameter—but as they nearly always divide, as indicated, into a few erect pseudo leaders, as well as large somewhat spreading branches, and these often continued not far above reach from the ground, the grain-fibres become irregular from this cause alone; besides being intrinsically wonderfully tough and withey, wood white, light, and soft—reputed our best timber for ox-yokes especially, and ox-bows also occasionally, but for this latter purpose laurel, ash, larch, willow-root, or Eastern hickory, etc., are better; it is also appropriated to saddle-trees, on account of its great tenacity and lightness.

Notwithstanding its numerous uses, lumbermen do not consider it "timber" in the appropriated commercial sense, although here and there a sawlog or two may be obtained from a single tree; and which makes real good inside stuff for ceilings and the like, but is soon perishable when exposed to the weather, save only the pitchy knots; but for oven and kiln-fuel, where well distributed heat is requisite, it is worth two hundred to three hundred per cent. more than the best of common firewood. For pottery purposes, also, it is far preferable to the intense heat of manzanita. Yields an abundance of excellent turpentine and a superior oil; if bark-girdled before cutting, would pitch well and be valuable for making tar. These trees, however, are seldom if ever seen in dense groves, but sparsely distributed over extensive areas—well on to one thousand miles of the lighter hilly lands of California and Oregon—they also inhabit some of the most utterly sterile, rough, and rocky soils imaginable, and even these lands first peopled with trees would thus serve to sustain a pretty large population; the nuts, even, might become an important article of commerce and source of national wealth. The central, continental, and Pacific pine-nut crop, properly harvested, would far exceed the wheat crop of California. Few are wont to duly estimate its value for human sustenance alone, apart from animal sustentation. Speaking of the nut crop in general, of course we include also all the pines, as *Coulteri*, *Torreyi*, *monophylla*, *Parryana*, *albicantis*, *flealis*, *Lambertiana*, etc.; indeed, it would not at all surprise me if one species alone of the list could be selected that would exceed our entire boasted wheat crop. It is really remarkable how few of these seed suffice for very long and fatiguing journeys. Viewed from the native standpoint, is it any wonder the Indian will exchange your chippy baker's breadstuff for his delicious "piñon" and acorn "pone?" This very nutty, rich, and delicious diet they are apt to feed upon too exclusively, continuously or inordinately, and in such cases the great excess of oil lays them liable to boils and the like, as in our own similar childhood's experience and maturer observation. Coveting a change of

diet, we have watched the Indian go forth a day's journey to procure meat, taking neither bow and arrow, gun, nor any other weapon nor trap, and yet return in the evening laden with booty. The reader may be curious to know one of his ways and means, *e. g.*: Provided with a few pine-nuts, as usual; finding squirrel haunts, he raises one edge of a flat stone upon another, propping it up with one of his "pifions" set endwise; Mr. squirrel gnaws one side, weakening the support, when down comes suddenly the dead-fall and secures him, and so at eve, passing from stone to stone, the long string of fat squirrels is no longer a mystery.

So much confusion has hitherto arisen by mistaking this pine, in numberless ways, up to a recent date, that we may be indulged in a few details and reviews, especially of the more striking contrasts: First, it is oftenest mistaken for the 'Greatest Coned Coulter Pine (*P. Coulteri*) of the coast, but that is a cling and close-coned pine; this Gray Pine is loose, opens and sheds out its large cylindroid seeds so soon as ripe, and for the most part forthwith falls away; is darker mahogany-brown, shorter, and relative to length, broader; shaped more like the old fashioned beehive. Whereas, Coulter's is of lighter color, raw umber-tint and oblong, say about one third longer; the hooks of the scales larger and longer, some often two to three inches long, Sabin's being shorter and more flattened; seed-wings of Coulter's dark-brown, almost black like the seed itself, besides it is obliquely obtuse, four or five times as long and large, and yet the seed itself is much smaller, one third to one half the size, somewhat flattened and trianguloid. In Coulter's, also, the leaf-straw is much larger and longer, bigger and longer boots, club-footed, more manifestly scaly, scales fringed or eyelashed at the tips; the lighter colored leafage has very little of that delicate blush of sky-blue; in short, the whole aspect of the tree is distinct at all stages and in all conditions of growth, from top to toe. It seems almost a loss of time and valuable space to enter into a fuller review of what a tree is not, when there is so much to be said or written of what it positively is. But why we should still continue to copy old errors in topography is not so easily accounted for, since all the world observes, or is presumed to observe, them along the great continental thoroughfare of the Central Pacific Railroad.

This Hooked Bull Pine, as the pastoral herder has it, for he sees bovine horns in the hooks, is said to have been first found "on the Cordilleras of California at a very high elevation, one thousand six hundred feet below the region of perpetual snow," afterwards nearer the seacoast lower, "but almost invariably on the summit of high elevations on the mountains," etc. Now the fact is, this is emphatically a foot-hill pine, some say as low as tide-water; but we will say two

hundred feet of the sheltered Coast Range, rising the east of Sacramento Valley towards the Sierras, to four hundred feet as the lowest limit, from thence it reaches two thousand five hundred feet altitude, or even more, of our snow mountains, and on the cold exposed coast mountains of St. Lucia about the same. According to Hon. B. B. Redding's careful and exceedingly useful Sacramento Valley observations, this pine is not at a higher elevation than that in which the temperature is the same as that of the valley in the same latitude, but it also indicates increased rainfall in these contiguous homolatitudinal valleys, hence plants, crops, trees, fruits, etc., growing in the valleys can alike be successfully grown on these foot-hills, due shelter and aspect given, with the additional advantage of purer air, more equable, drier, and healthier; free from fogs that retard if not preclude the ripening process, discoloring almonds, nuts, and other fruits they do not sour and utterly spoil, as peaches, grapes, and all Autumnal fruits, together with the genus homo; and the further advantages of sweeter and more wholesome water, better drainage, longer ripening season on account of later frosts and more gradual "closing-in" season, by the coöperation of earlier droughts; and when the growing season is closed, more perfect rest—consequently fruits of richer quality, etc. And even the frosts and snows that do occasionally occur here—lay their soft and downy mantle so quietly over the vernal ardor that ever broods over these semi-tropical little hills—that they are only lovingly chastened and withheld from the premature exposure of these sentinels and harbingers that patiently await the earnest call of Spring. Thus invigorated for intenser reaction, at length they go speedily on, prospering and to prosper, until they win the final goal of "Autumn's farewell smile"—the best, the richest garnered fruits of the Pacific.

This Largest Nut Pine and Digger Pine, as it is also called, we have seen to be a tree of unique beauty, expressiveness, and manifold uses, as in some sense suggested, with bark of body and branches also of similar leaden gray, and moderately even; but if this gossamery gray-green cerulean almost smoky Indian-Summer sort of haze foliage is to be designated "a compact mass of deep-green verdure," why then one might as well close the eyes—their occupation's gone—observations, like oracles, silent, and classic responses forever dumb. Nor let it ever be presumed that a thousandth part of the knowledge, significance, and use of this pine, or any other subject or object in nature is entirely understood. The word "exhaustive" belongs nowhere in the vocabulary of God's works, and is ever abhorred by the wise; such expressions belong to the lip of the viper of the tree of science—never to the tongue of the true man.

THE GREAT-CONED COULTER PINE.

(Pinus Coulteri.)

"Where the wind
Could linger o'er its notes, and play at will."
—Arnold.

THIS is a noble pine in all respects that regard the landscape or rural adornments, yet seldom collected, often omitted, briefly and imperfectly noted, sometimes mixed and mystified by being confounded with allied species. No pine of similar size or similitude, such as Sabin's and Torrey's, can compare with the Great-Cone Coulter Pine in dignity of expression, whether we regard the more massive limbs which come out thickly and apparently irregular here and there at all points, alternating as the spiral plan in trees necessitates (hence more easily climbed), or if we regard the unusually long and large foliage, a foot or so in length, of sober light-green hue, but not near so gray or glaucous as Sabin's slender straw, and longer than Terry's stout and long straw; the boots large and club-footed, formed of broader, distinct, light-brown scales, fringed on the margins, etc. But when we come to regard that monstrous cone—the largest in the known world—with claws of a grizzly bear, we begin to appreciate a few of the details that give so much force of general expression to the tree.

Remarks applied to the northern forms of this vicinity, and to those found upon open hill-tops of the coast mountains, must be somewhat qualified when seen in the deep gorges of coast canyons farther south, for in such situations any one must see they would have less spread, and from being flat or round-topped, they do actually aspire to a conic summit, and these trees become more than one hundred feet high and from two to four feet in diameter; here, instead of having single sugar-loaf cones one foot to a foot and a half long by seven to eight inches in diameter, they have enormous clusters of from three to five of these prodigious cones! the great hooked scales, or rather the terminating hooks alone, from the top of the disks, being two to three inches long; *i. e.* near the base of the cone. We have a sketch made from the one in the British Museum. These are of the close and cling-cone type of pines which do not open, but retain their seed for many years, at least on our coast; whereas, Sabin's pine, with which it has been confounded, sheds its seed so soon as ripe, and the cones forthwith fall off. An empty cone is,

however, now and then held over on *P. Sabiniana*, but this misleads no one, for the form is by no means the same, nor are they ever of the light clayey or raw umber color of the Great Coulter Cone; nor are the leaves alike as to size, length, or color. *P. Torreyi*, it is true, does not let go its seeds so readily as *Sabiniana*, but its roundish smaller cone is of dark purple-brown or madder hue, and in neither of these is the wing of the seed of any particular import, while this has much smaller flattish black varnished seed, and very long large dark brown almost black wing, and though stiff, is not thickened at its grasp of the nut, etc.

This pine, like Torrey's and Sabin's, insignis and others, is of equally rapid growth, yet few are found with clear shaft, the limbs usually coming out low, often near the ground; thus it seems little suited for sawlogs, and if it were so the lumber is of little value, save as a dernier resort, on account of such an ungainly warping proclivity. To recount examples would partake too much of the grotesque for sober narrative; your house would go into spasms; no Jack nor joiner could make or break joints; your doors shut at one end and open at the other; children born crying with one jaw out of joint, and your pigs puzzled to know which side of the fence they were on, after the most strenuous efforts in their way. In short, the lumber is altogether too impracticable for common use.

MONTEREY PINE.

(*Pinus insignis*.)

"Along the pine forests on the shore,
Rolls the gathering melody."

PERCHED close upon the Pacific shores, from Pescadero and Pigeon Point to Monterey, and south to San Simeon Bay, this pine catches the last celestial sunset glow that "fires the tops of the tall pines," and is the favorite conifer of the coast, so universally in cultivation in the vicinity of San Francisco. The best evidence of adaptation to this and similar soils and climates, is found in the fact that concentric rings of annual growth from one to one and a quarter inches thick, and perhaps even more, can be both seen and well substantiated by corresponding history and date, thence showing an average increase of a foot in diameter at least for every seven years, from the seed; and this in the commonest light soils, without care. Seeds sown broad-cast and left

alone to nature, where stock is excluded, have given very nearly like results. No other pine, native or foreign, shows greater vigor here; in short, instances are too numerous and notable to need lengthy confirmation, and few in early age exceed the symmetry and dense sheltering qualities of the Monterey Pine.

Their value for these purposes as forestal woods contiguous to, and especially to the windward of orange, olive, and vineyards, or orchards of every kind, is too well known, however little appreciated. This tree, like many others, although bending to the lea, under persistent and powerful northwest winds, a short lull is sufficient for it to right up and pursue its natural bent. From branching close to the ground for a decade or two, or after the early and middle period of growth, then later on in age, it is wont to relinquish the first relatively long and strong arms of juvenile contest below to its juniors and their companions, the Kobby Pine, etc., and thenceforward aspire to a higher destiny in the heavens—donning the picturesque in pose—challenging the elevated buffetings of the elements up in the blue; for this tree, it should be noted, attains to one hundred feet and upwards in height by two to four feet or more in diameter. Bark dark brown, thick, deeply fissured and broken; leaves four to five inches long, margins of these needle-straws finely saw-toothed, in threes, short boots, one quarter of an inch or so, smooth cheery-green; cones shaped like a Farralone egg—the murre or foolish guillemo, etc.—only obliquely one-sided or greatly swelled out and knobbed on the exposed side at the base, for the point is bent down or back close against the tree, three to five, in whirled clusters; the somewhat diamond-rhomboid disk, short recurve-prickled in the center. These close clinging-cones are three to five inches long by two to four thick; color light amber to cinnamon-brown, smooth and shining; requires two to three years to ripen well, and remain on much longer; seeds black, tubercled, about one quarter of an inch long, wing three or four times as long, widest above the middle; cotyledons, five to seven.

The timber is very tough, and while more abundant, in great demand for a thousand useful purposes, but the supply soon failed and gave place to the redwood and other more northern coast lumber.

This incomparably quick-growing pine will, ere long, be in the greatest demand for seed to reinstate those treeless tracks and mountain ranges along the coast with those sweet solian forests which so much improve the barren soil, conduce to the salubrity and equable geniality of climate, to economic demands of home and commerce, utility of pastoral and arable lands of the interior of the State, especially south, where the greatest lack is felt; and even the existence of

orange, olive, and vineyards, and fruits and fields in general, may yet be found to require them, for they retain, distribute, and precipitate humidity, and thence springs and streams are maintained for all the indispensable wants of life. A wiser generation may yet find and apply the ways and means in the light of a genuine public policy, which will be known and recognized, in very deed, to be of the utmost importance to the welfare of every settler and citizen of the State. A people wont to set at naught nature's laws, are doomed by their own acts to ruin—extinction—and must soon give place to a nation working right-use-ness. They render possible general and varied culture, adequate to human wants, to secure an ever ensured prosperity; not simply measured by the common standard of more manifest and merely utilitarian wealth, they are indeed the great continental lungs of the wide world, purifying and vivifying its litoral veiny streams, for are we not rapidly acquiring knowledge of ærial currents and laws conforming thereto, and applying them to human requisites? They confessedly oxygenate and osmose the air on which man subsists, more than upon food, drink, clothing, habitation, and all the mechanical, industrial, and social arts or economics combined. But who shall be able to tell all their uses? Let us learn to love them, inspire their exhilarating ethers, expatiate in their glory and their beauty, wisely enjoy their use, honor and revere these natural types of grandeur and of glory—real and ideal; maintain their integrity unimpaired, but rather in multiplying, multiply and replenish the high places of the Pacific, and pass them on as living monuments of ancestral wisdom, from generation to generation.

KNOBBY CONE PINE.

(*Pinus tuberculata*.)

"Low stirrings in the leaves, before the wind,
Wakes all the green strings of the forest lyre."

—Lowell.

THE Knobby Pine is a lofty tree of much beauty, from seventy-five to one hundred feet high, by three to four feet in diameter, in the northern interior of the State, chiefly in the vicinity of Mount Shasta—east, south, west, and north—and also extends along the Sierras southward. Here it forms stately trees, often uprightly branching towards

the top. In general, not so flat-topped as the usual wont of pines, nor foliage tufted, and so more diffusely mantled.

On rather bald magnesian hills it sports quite another extreme; here, laden with cones one can readily reach from the ground. For the most part, along the coast hills the tree is of low growth, even broadly pyramidal in outline, shooting out relatively long widespread branches from very near the ground, so that the span often about equals the height, say ten to thirty feet, or so; six inches to a foot, or more, in diameter; bark, light brown and roughish. In some localities, of slow growth, those in richer heads of ravines indicate thrift. In the vicinity of San Francisco it seems pretty well satisfied with a humble position in the world; envies not other Nobs, nor doth it go to be promoted over the trees. The numerous rigid horizontal limbs, where it is most buffeted by fierce winds, necessarily distribute the foliage better than kindred conifers of the coast. Owing to this peculiarity, it divides and conquers the stormy winds well, and the residue is so rendered powerless for harm that it passes through chastened in its joyous journey. In this characteristic it differs from the Monterey, Bishop, and other kindred pines. This apt arrangement of limb and leafage make it more than a match for the nearly dead-level breeze that surges below, as the Signal and other like species are for the storm that plays above, where the sea-bird and the eagle soar.

The leaves are in threes, booties half an inch or more high, the thready foliage four to six inches long, scarcely remotely saw-toothed, dull, somewhat blue-green. This lop-horned is laden throughout with roughly tubercled cones, pretty closely set, and strongly bent back. These short-horned granaries are four to six inches long, about a third as thick, in whirls of two to four or so around the branches. Several of these wheels of green cones often form on the same year's growth, require two or more years to fully ripen; color leather-brown, more darkened, faded, or bleached, or "silvered o'er with age," as they cling persistently from ten to thirty years, or for a lifetime. This cylindroid-conic fruit is moderately pointed, slightly curved, and very oblique at the base on the outside, the angled diamond-like disks of the scales, as it were, hilled up into a thick, prominent knob, prickly-pointed; seeds small, black, and slightly grooved on the sides, about one fourth of an inch long; wing about three times as long, widest at or above the middle; cotyledons, five to eight.

Found mainly on the coast ranges, from San Bernardino and Santa Lucia Mountains, to San Francisco; north, to Shasta, and along the foothills of the Sierras, Forest Hill, Forks of the American River, two thousand five hundred feet altitude, and here and there throughout the State. A

chary dispenser of seed, prudently shedding out upon arid and restless sands, at long intervals, only after prolonged consecutive hot and dry days, such rarely occur only once in ten years or so.

The best shelter-pine on the coast, ever battling for its own and others' freedom, singing heroic songs to the tempest, or tuned and timed to softer lullabys, echoing the shore—anon sighing some celestial love song that "sweetly dies along the gale." The long and early buds of Spring coated, as it were, with thinned white lead are likely to attract attention and are really ornamental.

BISHOP'S PINE.

(*Pinus muricata*).

—— "the purple mountains bore
Greetings to the sunset shore—
Father guide me! day declines!
Hollow winds are in the pines."—*Hemans*.

MOSTLY a middle-sized pine of fifty to one hundred or more feet high, two to three feet through, bark reddish brown and rough, open and free spreading branches in due shelter, more retracted and dense when exposed. Leaves two in each sheath or boot, four to five inches long, strongly saw-toothed; the boot from being half an inch long, is at length, reduced to barely one twelfth; male flowers in short oblong or oval spikes, an inch or so long, outer and inner involving scales, six to eight, of equal length; cones set close down in clusters of three to seven, these are apt to continue closed for several years, until a long spell of hot and dry weather supervenes, say, usually, once in ten years, when they open and shed a large amount of seed. The form of these cones is obliquely egg-shaped and pointed, usually about three inches long by about two broad. At first, cinnamon color; later, chestnut brown, and in great age gray-bleached. The prickles of the scales from the tops of more or less thickened acute points, often quite elongated into straitish or incurved spurs, these becoming more swelled on the outer base when much exposed to bleak northwest winds. Seed grooved, rough, and black; wings half to three fourths of an inch long; widest above the middle.

Distinguished from the Knobby Pine by having only two leaf-straws in a boot; cones much smaller and very much shorter. They both have close persistent cones, which remain on from twenty to thirty years.

CONTORTED TAMARACK PINE.

(Pinus [inops] contorta and var. Murrayana.)

"A slumbrous sound, a sound that brings
The feelings of a dream."—*Longfellow.*

THIS pine abounds in moist inter-vales and limited plains along the whole range of the California Sierras, around north of Sacramento Valley, down to the coast within spray of the Pacific ocean; also, through Oregon, and so on to Alaska, Rocky Mountains, and Utah. It always forms the first forests of the primeval lake, multiplies around the low, over-increasing meadow margins, and along the banks of upper alpine creeks; often covers, more or less, the seeping sides or moister slopes of mountain ranges up to about six thousand to ten thousand feet altitude. From a tree of moderate, or even small size, on the coast—say a few three to five, to thirty, forty, or sixty feet—it rises on the high Sierras to one hundred and one hundred and fifty feet high, rarely two hundred, three to five feet in diameter in some rare instances; top of all forms, but the type conic, branches slender and rather short, giving the larger forms a towering aspect with long, clean, trim trunks of clear timber, three to half a dozen saw-log lengths, or for one third to two thirds their height; bark exceedingly thin and turpentine, especially where abraded, to which, more than other pines, it is subject; thus it is very apt to be fired on all occasions, and destroyed in great numbers. This bark has the peculiarly rippling appearance, as it were, a perfect transcript of the mirrored lake when the morning zephyr is just astir over the placid waters beside which it grows. A tree of rapid increase in little else than granitic debris of the Sierras, but from the lack of tenacity in the soil, from shallowness, and its varying states, treacherous surroundings of snow-slides, winds above, floods below, and frequent land-slides as well, changing the depth of water levels, and periodical fires, etc.—all conspire to prostrate or to kill them standing.

"How hushed and restful lies the land!
The moon-beams light the pine trees round;
Verging to friendly death they stand
And point with branches to the ground."
—*After Cornhill Mag.*

These dead trees, throughout, and those dead limbs on living trees also, are wont to curve downwards and are

bowed inwards, reversing the natural order of wintergreen conifers and kindred trees, their boughs being oftener like the bow on its back. This very common condition of the dead limbs may have suggested the special name of *Contorta*, however inapplicable it may be to its natural characteristics, for this feature is too commonly observed everywhere, especially in slender sappy limbs of very many alpine forest trees, and therefore is not specific to this species at all; but, what is worse than neutral, or meaningless, is rather misleading.

A two-leaved pine, needles one and a half to two inches long, rather rigid, not very sharp-pointed, margins minutely saw-toothed, these short leaves densely cover all the smaller twigs, and remotely suggests comparison with the New England Tamarack Larch (*Larix Americana*), in a general way, as also from its swamp associations. The hue of the tree, however, is more yellowish-green; cones, elongated, egg-shape, sharp-pointed, or often rounded, especially when open, generally an inch or two in length; scales, (said to be knobby?) prickly, like *P. muricata*, and other pine cones; these may also sometimes be more thickened where most exposed to bleak winds, as we see here—a result of *habitat*—but not specific, nor varietal. On the coast the cones remain closed, and persist for many years; but what is called variety *Murrayana* (?), of the Sierras, open at maturity, scatter their seed, and fall away the same season.

Probably no timber in California ever so greatly disappointed the early railroad builders as the Tortuous Tamarack Pine—misled by a famous name or otherwise; at all events, if we remember rightly; it so decayed within two or three years as to be totally discarded, notwithstanding they had cut off and burned up all along their track far better timber, and some more lasting than the cedars of Lebanon, in serried hosts crowding to hand so very accessible.

CALIFORNIA WHITE OAK.

(*Quercus lobata*.)

"Jove's own sovereign tree."—*Virgil*.

TREES of summer-green foliage, in colder climes, contribute a large share to the thrilling joy and surprise of spring-tide—as one awakening from a sweet sleep, refreshed, with the dew of his youth upon his brow in all tranquillity—serenely embosomed in that innocent Aurora

of the year, whose inmost pleasantness and peace halos at once the world and all things that are therein. Hence, as they serve so conspicuously to discriminate successive seasons, their absence is a great loss to any landscape; then, how much more so to us, who have so few grand types to boldly mark the change. Who can adequately count the value of that precious impress of innocence suggested by vernal buds and tender foliage, and all the ten thousand accessories of a well-pronounced Spring? This primeval state is the ever-blessed earthly emblem of the paradise of the ages—the year-spring, the day-spring from on high, and the Edenic origin of all worthy sentiment, the divinely innocent fountain-source of all right ideas and true growth of mind.

Of all the trees of the grove, for robust and sturdy dignity of character, nay, majestic elegance and manly pose, for freshness and for variety of expression in body and branch, twig and leaf, none excels the summer-green White Oak of the valleys and plains of the Pacific. Main trunk mostly short, five to ten feet or more in diameter; fifty to one hundred feet high, or even more; huge limbs, duly balanced and distributed, diverging at broad and varied angles from massive forks; branches with flexed elbows hither and thither, or bent and contorted in all directions; the ultimate twiggy sprays alike irregular, often only minuter mimics of their originals, yet some of the finest types, to foil this natural irregularity, crown and drape themselves throughout with pendulous branches, as we shall see; the deeply lyre-bayed leaves, lobes slender and blunt, openly notched, often again sub-lobe-toothed, downy only beneath in age; grayish green, somewhat softer and lighter hued below. The male or stamined flowers in long pending tassels, each floret calyx with six to eight trianguloid-lance lobes, downy and eyelashed, bearing as many round anthers. Annual fruited, or setting and maturing on the new growth of the same season; the acorns very long, conical (dark color), from one and one half to two and one half inches long, usually sharp pointed, set in deeply hemispherical finely chased cups, more or less knobby or tubercled, moderately tough, horny shell, smooth within, hung from smooth, fresh green tips or twigs. The great cloud-like masses of foliage are, as it were, often in first, second, and third storied tumuloid groups, yet never towered, seldom sombre in any species, least of all in this; even the most remote approach to formality suggests no monotony, for the long, drooping branches pend archwise, like the grand and eloquent American Elm, still preserving their self-reliant ease, strength with grace, neither rough nor rigid. These elegant sprays or wreaths are seen descending down low, or lying along the ground, doubly lining the lawn,

twenty to forty feet long, of nearly uniform size, like large curtain cords, somewhat simulating the Weeping Willow; but not with the despairing drop of the sad willows of Babylon; nay, rather draping robes of royalty, resting in humble repose, or reaching lowly the leading-strings—fit emblems of science applied—to lead and lift the lowliest son of earth, and though the great head be among the entanglings of the thick boughs, and his brow crowned with garlands of useful service, and there the great eagle builds her nest in the heights and gathers under her shadow, yet may the feeblest child also pillow its head on the little branchlets, beneath, light with leaf, and tenderly sheltered with shade—meanwhile the still soft voice of silence hushing to peace.

This great White Oak of the Pacific has white bark, loosely cuboid-checked, often quite rough, and similarly far extended upon the limbs, is often scattered here and there, park-like, or growing in groups on the low hills, river banks, in the valleys, and on the plains. These massive low and broad herculean colonnades often rest on the neatest lawn, sole occupants as far as the eye can reach. Relatively speaking, these oaks divide low into many huge branches, spreading as described, fifty to sixty feet each way, well balanced on the main body—with much diversity, also, do they often sweep upwards and outwards with symmetrical spreading top. The whitish-gray bark is shared by other oaks, but none have such long and slender acorns, as observed, three inches by one half to three quarters of an inch in diameter, sharply cone-pointed, nutshell thinner, smooth inside, and the tiny abortive bottle-shaped ovules sub-erect, etc. As these generations of men and oaks pass swiftly away, we hasten to record, lest self-conceiters arise upon the scene, denying observation and experience not their own; to them, neither these trees, those scenes, nor the sweetest ecstatic bliss of celestial Indian Summers, that tongues are powerless to utter or pens portray, forsooth now no more, and because they never saw, therefore never were nor could be before; “offspring of a fervid imagination;” as if Nature herself were not now and forever a thousand times more poetical than any poet, and more philosophical than any and all philosophers. Perhaps even now it is impossible to realize the extreme elegance and the wonderful wealth of foliage that characterized some of these choicest primeval and lofty types of the land. Thanks to the faithful photograph, we are not left to pen without a witness. Contemplate, then, that Napa Oak, for which we have full oft’ paid the last mite for friends, and tell us if, with the Queen of Sheba, the half had been told. We repeat again, with ever increasing emphasis, our wonder at the wealth of foliage, massed above, curtained below, pouring, with unparalleled bounty, foliage on foliage, in great

heaps upon the ground, as though it were not enough to canopy and cloud the sky and the horizon round about, but these sweet, fragrant, summer-green White Oaks must needs carpet the earth in softer living green beneath our feet, and luxuriously couch and pillow the pilgrim devoted to sylvan beauty. Truly, in the best sense of the expression, are these covered and floored, and so supereminently symbolize the external and natural achievements and scientifics of life. Forth from the secluded vale behold this White Oak abroad on the fruitful plain; witness his extended wreaths flung free and far o'er the bosom of the wind, and contemplatively, who can tell the happy hearts that have swayed or swung sympathetic in these boughs, quietly, gracefully responsive to the breeze, like a floating song, anon bearing the soul aloft, serenely soaring in peace, chanting its joy to the echoing air "like music wandering o'er the boughs."

The acorns are stored by the Indian; the woodpecker and the jay make holes in the bark and drive the germinal end in for their winter food. The native stores them largely for bread—he will exchange or slight your bread for his own "pone." The acorns are hulled and prepared for cooking by a little beating and then piled on a tiny sand mound, often in size and shape of a large milkpan turned bottom up, duly leached thereon, then made into cakes and baked in the ashes. This also was the dainty dish of our forefathers, as it still is of the wild man of the wood, serves as of yore to feed his flesh and oil his sinews for the chase. They are deemed good food for domestic and wild animals, especially the hog, bear, deer, etc., but if hogs feed on them green, as cut by the impatient squirrel, they are apt to cause a kidney disease, whereby they lose the use of their hind legs and die. Toasted and ground for a coffee, they claim repute for the *king's evil*, etc., this acorn is aptest of all to prematurely germinate.

The timber is reasonably tough when young and thrifty, but becomes brittle and brashy with the infirmities of age; often late in the season when the hot sun broils and steams the sap, as it were, internally, an ax struck into it hisses like a legion of little safety valves, similar to the Post Oak of the south; and sometimes, most unaccountably, it is said to burst with a loud explosion, and strong limbs that had hitherto withstood centuries of storms, in the calm airs of late summer and early autumn crash unexpectedly down, the fracture disclosing not the least cause of weakness. I believe this only happens in the hotter valleys and exposures, and is never known of any evergreen oak at any season. As all great men are supposed to have their satalites, apes, and namesakes, so have the trees. Prof. Brewer and Mr. Lemmon are credited with a variety of this oak, two to six feet high—*fruticosa*, now *Q. Breweri*. By a venerable tradition, of our forefathers it was deemed unlucky to cut down any celebrated

tree. Evelyn says of the two men who cut down the Vicar's Oak in Surrey, England: that one lost his eye and the other broke his leg soon after. Should like to know what evil befel those godless miners who destroyed that majestic oak, over eleven feet in diameter, that gave name and renown to Big Oak Flat. One thing we do know, such irreverent and reckless disregard of God's best gift, has in potency, a wicked and heartless principle that forever tends to ill luck, could never prosper long, either in this sphere of life or that other beyond the river Styx. What marvel of multitudes, apart from man, beasts of every kind, birds of every wing, creeping or flying thing, crypt of every hue, from green and gray, dim and dark, red and blue, black or white, altogether throng the cherishing and useful oaks; and not the least of these, the busy bee that literally swarms the trees in summer and autumn to gather honey, not alone from flowers or honey dewed leaf, but mostly the bud that oozes its wine-colored nectar drops.

BLUE DOUGLAS OAK.

(*Quercus Douglasii*.)

"Where, twisted round the barren oak,
The Summer vine in beauty clung."
—*Longfellow*.

THIS deciduous Blue Oak abounds on extensive park-like terrace-plains and foot-hills, or from coast to upwards of three thousand feet; is often rather small or only a middle sized tree, say forty to sixty, rarely seventy-five feet high; one and a half to three or four feet and more, rarely seven feet, in diameter. Let it be understood, most of our trees sport not only extremes in size, but wonderful variations of form, after their kind. These oaks, in the main, are of the low, mostly round-top old apple orchard type; and while live oaks often tend to keep up this latter illusion, this oak is only thus remotely suggestive, in the general view, at a distance; for the very white, almost white-washed bark, and pale, hazy-bluish foliage, soon disperses the charm: closely inspected, the body is seen handsomely and rather finely chunky, chiefly on the vertical-fissure plan, but the converging and diverging water lines are not very deep, for the bark itself is thin, nor widely gaping, like *Q. lobata*, but are more finely distributed and not so often transversely parted, consequently the bark sections not so cuboid.

These trees are usually scattered, and anon grouped, or

occasionally almost groved, in nearly contiguous masses; the crooked branches are very picturesque in strong horizontal sunlight, they even show to greater advantage for the paucity of leaves; but perhaps even this is partly illusive, on account of the softened tint of sky blue, or bloomy hue. Some smaller trees of poorer white, or yellowish clay soils of our hill-sides, have brighter blue foliage, of exceeding great beauty; but such timber is a great vexation to the woodman, as it is next to impossible to split it, and when dry, with a little figure of speech, hard as iron, hence, also called, out of compliment, Iron Oak; heart, small and black, often none at all, and entire wood white. The branches of these are more horizontally spread, and of flatter top, stiff and angularly kneed; branchlets, short, often brittle-jointed, never pendent, of vagrant habit. This poor representative of the Post Oak (*Q. obtusiloba*) has a tumuloid cloud-like spray, only moderately spreading; in general, all the forms tend towards the hemispheric top; the plumed, lyred, and urned are the most graceful, varied in general forms, diversified in branch, like most of their kin, they are redeemed from formality; but the shade is too uncertain, has a hot and unrefreshing air of aridness about it that one never feels beneath the overgreen or denser deciduous oaks; the leaves, too, seem to lack character, or rather express parsimony, as they are not only scant but too much retracted in among the hairy twigs, especially is this the case in those varieties with smaller and narrower leaves; these more common forms rather suggest meagre plebian vulgarity than magnanimity; nevertheless, they adorn the landscape when viewed from afar, and go to make up a picture of much beauty. These remarks are more applicable to the sun-scorched hill and plain of late Summer and Autumn; in early Spring and Summer, when the tender buds and young leaves first put forth afresh, and all the land is one broad green carpet as far as the eye can reach, with myriads of beautiful flowers of every dye, the scene is marvelously changed, we would then fain forget and forgive those shortcomings to an abstract standard of taste, so harmoniously are they in keeping with their own surroundings; nor is this relation less by night than by day, for doth not Governor Trumbull say:

"Now night came down, and rose full soon,
That patroness of rogues, the moon;
Beneath whose kind protecting ray
Wolves, brute and human, prowl for prey."

Then these pale quirky apparitions of a lively imagination become the moon-lit ghosts that nightly stalk the plains, and with rugged horns go round about the oaks, climb hills, or dimly seen evanishing down dale, nervously gesticulating

their white arms aloft till the trembling stars beyond seem agitated! The bosomed owl also wakes, startling; the fiendish, sardonic laugh preluding, they, too, cry unto their fellow a ghostly, chilling cry.

This tough and close-grained timber is principally devoted to firewood, of fair quality; but on richer soils, with more moisture, and so of rapid growth, and where not too hot, it has attained some reputation in rural districts for implements of husbandry, etc.; *e. g.*, it makes good spokes and fair felloes, hubs, and axles, and for pump purposes, where great tenacity is requisite with strength and stiffness; but being so often associated with the Highland Live Oak (*Q. Wislizeni*), this latter is apt to be preferred.

This hazy-blue Douglas Ghost Oak is perhaps most of all trees laden with masses of mistletoe, *i. e.*, along the belted regions of the higher condensed, or grosser, recoiling, and more humid malarial limits, to which we have elsewhere alluded, and also more subject to diseases; better dwell down deep in the fen than upon its borders, for the lukewarm state of indeterminate stagnation is ever one of great danger. The foliage abounds in galls and gall-spangles of great variety, and some of brilliant beauty. The leaves have not the fragrance of the Lobe-leaf California White Oak (*Q. lobata*). The twigs and leaves in the young state are starry-hairy; stipules narrowed below and lance-formed above; leaf stems exceedingly short, outline of blade reverse-egg-form; base sharp, short-lobed, and spine-tip-toothed; the starry-velvety hairs yellowish beneath and early shedding from the upper surface, leaving it somewhat rough, and at length frequently becoming nearly smooth and bluish. On older trees leaves also oblong or oblong-oval, margins shallow-bayed, the lobes blunt, often almost obsolete; again saw-toothed, or gash-lobes inclined forwards, apex blunt, and sometimes base also. The soft blue bloom above has given rise to one of the common names, Blue Mountain Oak, but this is a misnomer, as the title "mountain," even of the third class, only rightly applies to single elevations three to four thousand feet high, rather than to collective elevations, for these properly, and by common consent, are and should be called "highlands;" hence, Blue Highland Oak is so happily suggestive of that other blue-bonneted race—realm of the rigorous virtues, the rural and the social, where poetry and song still delight to linger, loth to leave, like good Lot of old, the cities of the plain, catching the far off echoes as they journey towards serener heights,

"Where freedom wakes her mountain song."

The texture of the leaves is parchment-like, size two to

four inches long, one to two broad: furthermore distinguished from *Q. Garryana* by a smaller and more slender acorn, usually in pairs, and relatively deeper cup; buds smaller, oval or nearly tiny egg-shaped, of bright brown cinnamon color, and only slightly hairy in Winter. The sparse and slender tags have the stamens set closer down, etc.

From the great liability to confound this species with Garry's Mountain White Oak, it was deemed advisable to note carefully these few particulars. This oak extends higher up the western slope of the Sierras, and is perhaps almost entirely confined to middle and northern California, from foothills to near the coast.

GOLDEN LEAF CANYON LIVE OAK.

(*Quercus Chrysolepis*.)

"Pleasant it was, when woods were green,
And winds were soft and low,
To lie amid some sylvan scene,
Where, the long drooping boughs between,
Shadows dark and sunlight shewn,
Alternate come and go."—*Longfellow*.

COMPLEMENTARY trees are oftener associated together in the glen with greater variety than on forest hill, broad plain, or along rich alluvial lands of streams. Trees so situated borrow some of their beauty by association and contrast. So is it with the Cañon Live Oak. But brevity demands we forego the pleasing enumeration. Suffice to say this Golden Oak of the golden State is allied to the naval Live Oak (*Q. virgens*) of the southern Atlantic Coast, and is in every way its equal. As with that renowned oak, so with this, the best timber is found nearest to the sea coast; but ours of the Pacific are more secluded in habit, being chiefly confined to the steepest, nay, inaccessible, deep gorges or cañon-sides, and are seldom or never seen in bottom lands.

This prefatory remark, however, applies only to the prime type, and not so much to several varieties that might be mentioned hereafter.

In general, this is usually a middle sized tree, not of high stature, say forty to sixty feet, by two to five, rarely ten feet in diameter; the main body not commonly rising high enough to cut saw-logs for ordinary long lumber, not often even in the close and crowded glen—of course, there are a few rare exceptions to any general statement, for in some

gorges it has both a long body and grows to one hundred feet in height, and that near San Francisco; in those more open, the huge crooked secondary bodies and their branches bow lowly, in fact, almost kneel, full oft, resting their far elbows upon the ground. Here and there they wend along, barely above the cañon-side. They thus present a broad tented circumference of shade, rarely over one hundred to one hundred and fifty feet or so spread, the outer and lower sprays of which a man may quite overreach, and a child often step out upon the boughs or safely recline in the spacious moss-cushioned forks of the branches. The somewhat tufted spray, in dropping masses, forms a pleasing picture for the eye to rest upon, and as they often hang out freely over the precipice, produce a charming effect on the lateral perspective. The uneven outline and salient little curves only add variety and grace, and lend peculiar woodland beauty to the wild scenery.

The color of the bark corresponds to the dark glen, and becomes lighter as it is more exposed, and is more flaky and evenly chinked. As it is a matter of unusual interest to discriminate well the true type from its varieties of the same name, and from similar Live'Oaks, altogether distinct, a few careful details are needful. The ever-green leaves are thick and leathery, a little oblong egg-shaped, sharp and awl-pointed, margins entire, or with rarely a few teeth; but let it be understood, on the contrary, that the leaves of young trees and suckers are prickly-toothed, like the Holly—indeed, often of the brightest shining-green, varnished, as brilliant and beautiful as an emerald, altogether unsurpassed by any known foliage of the West. Yet in age the general green becomes sobered by a delicate unpronounced ripper yellowish tint, or, as in trees farther away from the coast, often with the slightest, almost invisible, twilight of gray. On old or well grown trees, when the young spring shoots put forth, they are clad with golden glands and gland-tipt jointed hairs throughout, but chiefly the lower surface of the leaves, the slightly pappillose roughened surface of the leaves like one's tongue; subsequently, if these fall away somewhat, still the scars abide, or the lingual roughness remaining, it simply bleaches out, and so changing color, becomes bluish bloom-tinted, and on hills starry-hairy. These leaves, with some latitude of variation, are usually one to three inches long by an inch or more broad; all the young parts, it should be noted, are also more or less starry-haired. The thick leathery leaves are finely netted-veined above and below, the leaf-stipules linear-lance-spatulate-pointed, often bristly-herbaceous, plummy-hairy, one fourth to one half an inch long, or usually longer than the leaf-stems to the base of which they are attached. The catkins of male blossoms are

short, often branched, their calyxes (flower cups) with roundish teeth, sparsely hairy, the margins eye-lashed, stamens short, five to ten anthers on top of these threads, large, strongly cusp-pointed, cells slightly hairy. The female acorn-producing flowers, six-toothed, closely investing the embryo acorn, hairy and pimple-roughened on the back, scarcely a little scalloped on the margin; styles short, two to seven, erect; top-stigmas, broad, disc-form, emargined, or slightly notched on one side, color dark brownish purple. Acorns, solitary or in pairs, on short stems, one fourth to one half an inch long; mature acorns rarely set close down on the wood of the previous year's growth, and is what is termed a *biennial oak*, *i. e.*, they mature their fruit the following season after flowering; yet both old and young acorns are seen on the trees at the same time. The cup is scarcely hemispherical, about one third the height of the acorn, one half to three fourths of an inch across, and about one half as deep; the outer, lower, well defined scales, egg-form, acute, with brownish, thin, almost horny tips, more or less swelled below, but sometimes so overlaid with yellowish starry down as to hide their exact form; margin of the cup often thin and minutely toothed, satiny-villous within, of the six ovules in oaks only one matures; the five tiny, bottle-shaped, abortive ones of this species, are discovered on the side midway between the point and base, inside the shell, but outside the skin of the meat.*

These trees are seldom or never in groves, but scattered here and there, often widely separated, and for this reason rare, and if not timely known, are likely to become very scarce. In a general way we have already alluded to the quality of timber. The color of the heart and sap are alike white; texture exceedingly compact and tough, without any porosity of the White Oak, and far better for wine and other tight casks, etc., perhaps too heavy for many purposes, but very strong and lasting, hardens with age and due seasoning; if soaked, steamed, or treated as good timber should be, and then carefully kept a long while, to season slowly in the shade, or after being duly buried in tide or swamp mud, no timber can excel this for naval architecture, or mechanical purposes, especially where great strength and durability are required; it is claimed to be as elastic as the White Oak (*Q. alba*), but we have trees that excel it in this particular; does not warp and season-crack so badly as some oaks. It is almost needless to add, that where weight and crooked knees form no objection, it will be, ere long, very highly

*The fertile twigs of this and some other evergreen oaks often spend all their vital force of certain seasons in perfecting the acorns already set, and do not grow beyond it; thus the fruit may have the appearance of maturing the first year, although in fact biennial.

esteemed; and, as the root-knees are most of all valuable, it should only be selected and cut by the ship and wheelwright themselves; or one practiced in the art of selecting with judgment. Choice cuts of this timber are worth, at least, five dollars a foot—indeed invaluable. Let us still hope, forlorn as it may be, that by continually calling attention to this tree, as we have done, now, for more than a quarter of a century, somebody may yet be found to duly respect their own best interests and the public good. Not that we suppose for a moment that anything we could say, in one case of a thousand, would inspire a mustard seed of faith; no, nor even an angel flying in the midst of heaven, crying "Woodman, spare that tree," would suffice to stay the uplifted hand of a short-sighted greed. Nevertheless were benighted ignorance ten-fold linked to avarice, and doubly dull, will we ever cease to protest against a reckless vandalism; and though this generation "fear not God, nor regard man," other peoples may perchance cherish the choice seed and go to perpetuate the noble and supereminently useful Golden Oak, as a tree worthy to flourish when the Golden State of its nativity was no more, or only known as a watch in the night, or from the future historian, as a tale that is told. In short, this oak is far superior to White Oak in every way for spokes, axles, tongues, and reaches, bolsters, and braces, and all farming implements and machinery; the wood is often white enough, and finely compact and ivory-like for inlaying, etc.

Hitherto we have purposely avoided any particular reference to varieties, lest our attention be diverted from the main object in view, viz: that of calling special attention to the typical tree—the one best known, most eminently useful, and available for practical purposes.

The upland and open foothill form has little or no yellow fuscoid down on the leaves, but is pale bluish tinted below, and otherwise the foliage is darker, duller green, thinner canopied, but quite evenly distributed; in general outline the trees more symmetrically tent-topped, even veterans of fullest age seldom become picturesque in any decrepid sense, as they are never broken down by high winds; rarely, if ever, known to exhibit any of the venerable infirmities of age, for which reason the landscape painter might not choose them as favorites of his pencil. Seen from beneath their magnanimous spread, we behold a naked, clean, beautifully braced ærial dome, that reminds one of a vast umbrella; this results mainly from the leafage being on uniformly vigorous twigs, and mostly confined to the upper and outer surface of proximate final sprays, and to the leaves themselves, having very short stems, yet the very last twigs are not altogether unilaterally distributed, but they close up, and so cluster without

any break around as to thereby thicken this relatively thin expanse; the leaves are more roundish, oftener spinous toothed; but a wonderful variety of forms must be expected; acorns larger, cylindroid-oblong, and of the most perfect symmetry of any known, just as if turned with the precision of machinery, and so closely set in the cup that the creamy white base is most distinctly marked and is rather abruptly obtuse, the flattened base having a broad areolar insertion in a shallowed cup, and this nicely clean cut, thin margined, finely chased with small tuberculoid scales below. Sap and heart-wood alike almost as white as the holly, used for inlaying. On the high peaks, inland, they often branch low and brawny; but on lower hills they tend more to the oblong type of stature, and are sometimes seen spreading archwise as they ascend and urning at the top. A few huge specimens in the Sierras have quite the typical form, and for aught we know, may prove of excellent value as ship timber; but being so remote, and the quality so little known from actual use, they must bide their own day. It is, however, well to know that the timber of all the varieties holds a good reputation. Some other equivocal varieties might be here mentioned, most of which have no size adequate to use (*Q. fulvescens*), however, is found fifty to sixty feet high, and a trunk of four feet through, but for the most part it is only a small tree, often a shrub, as in other species on this coast. Scrub apes oft come in to imitate their betters, and some tiny mimics, of only a few inches, bear acorns, as in the Ceros Island variety, in these the leaves, very small, barely half an inch long, egg heart form, abruptly horny, sharp pointed, entire or toothed, very rigid and thick, shining above but net-pitted on both sides, concave curved above or warped up at the sides, tip recurved or turned back. The slightly velvety acorns, also in pairs, on short stems one quarter to one half an inch long, silky tomentose within, scales of the cup with more elongated incurved points, and, as often seen, slightly fuscoid velvety. *Q. vacciniifolia* has been deemed another variety; there are, doubtless hybrids which we must omit. Perhaps the best specimens here are seventy-five to one hundred feet high, two and one half to four feet in diameter—thirty to forty feet of clear timber on Tamalpais. From coast range to Sierra Nevada, with the Laurel, Madrona, Chestnut, Sugar Pine, and Tanbark Chestnut Oak, etc., in the coast and mountain-tempered belt referred to above Sacramento Valley to Yosemite, and below, where it is even found six to eight feet in diameter, and by "coast range" must be understood from northern to southern boundary of the State—in this latter section are found many magnificent trees, and even the smaller are complimented under the name of "Mall Oak."

FIELD LIVE OAK.

(Quercus agrifolia.)

"The green trees whispered low and mild;
 It was a sound of joy!
 They were my playmates when a child,
 And rocked me in their arms so wild!
 Still they looked at me and smiled
 As if I were a boy."—*Longfellow.*

THIS robust round-topped evergreen oak of the fields, as its specific name implies, is already associated with agricultural lands, and the rural scenery of a thousand happy homes; and it is a greater joy still to know that myriads more will throng these peaceful shades as the rolling years move on, ever more and more endeared to the hearts of a people, as pleasant home associations multiply and cluster around them. Childhood, manhood, indeed all animated nature, to a great extent at least, is the resultant impress of environment. Therefore, is it no ordinary boon to be born and reared beneath grand and sturdy embowering trees—trees of wood only to some, it is sadly true—but the charmed "wild woods" to others, and to your children, with all the romance, poetry, and divine philosophy of another Eden aglow in their hearts and eyes, more hallowed than Druid ever held, or sacred than bard ever sung!

Would any, then, wantonly fall far below the barbarian's appreciation, sink in this world's forever, adown the abyss of a dark and dismal *Avernus*, over which no bird of heaven ever yet safely flew; or, perchance, instigated somewhat from that other place, go to lift up the ax against the goodly trees of house and home; let in the lonely and the dreary, the bleak or burning desert, on home-life, its intro and retrospections; slay soul, by devastating heart and desolating head, until little is left save the semblance of a man? If so, go thy way, slay the grand and noble trees, and say to the vile and imbecile shrub and bramble, "Come, thou, and rule over us." Or, rather, let us not go on always hothousing their lives and ideas of nature, in a word, narrowing down associations to puerile and artificial human perversions, or recreations, and their disorderly limitations, low, lower, and lowest, lest we "educate" (?) the image and likeness of a god into that of a snob or sentimental dunce. Trees by their presence do preëminently ennoble mankind, and though they were only one of a thousand ways and means, the wise can never afford to dispense with any avail-

able methods the Allwise Himself hath instituted, nay, ordained, so as in any, and all ways to fulfill, finish off, polish, or beautifully adorn human life, that it be duly prepared to go forth to every serious and earnest duty, even with joy and with a song; run its high race of hallowed destiny rightly, and be greatly glorified!

The main body of the Field Live Oak is short—say five to fifteen feet, two to eight feet in diameter, forty to one hundred feet high, and often still greater spread—branches low, often extending nearly or quite horizontally, with many exceptions and indefinite variations, if, indeed, any general direction can be predicted of a Live Oak; it is, however, sufficiently safe, to convey a true idea of character, to say the lower masses of foliage are usually within reach from the ground; the principal limbs have the angular, zigzag, lightening lines of determined vigor and massive strength—couchant lion of the groves. This flexuosity is but the compressed spiral approaching a plane, which symbolizes while it gives the greatest power of infinite variation, yet forever retains its own essential character, has all the lesser quirks of its congeners, nevertheless always tends, true to its type, to present roundish outline of special branch-mass, as of the entire top. The artist may rarely find one in that state of “venerable decay” so often seen among many other oaks; our Live Oaks of the greatest antiquity seem most vigorous. We have in mind, while penning this brief notice, many grand illustrative types in the vicinity of San Francisco. Around the city in various directions may be seen trees similar to those of the San Rafael reservoir—body ten to twelve feet high, eight feet in the smallest diameter; bark blackish, thick, rough, and chinky; huge well balanced branches, four to six feet in diameter, horizontally spread one hundred and twenty-eight or more feet; eighty to one hundred feet high, dividing its strength into such monster main branches that some, at the spacious first forks, a cross section of which would give you a table plank ten by fifteen feet, or more. We may not dwell at length on the quaint and manifold forms of this pastoral tree—a study of art—perhaps they are already too familiar to warrant any but the mere mock interest of novelty; but the ever varying hath in it somewhat of all beauty, the never ending variety of genuine interest, however familiar.

Some trees, like their counterpart, humanity, seek repose, shrink from the stormy strife of fierce, persistent breezes; yielding, they lean to leeward along the coast and bay margins, plains, in windy gaps, on hills and northwestern vales, wind-way records; the tops of some seem capriciously to lean off from declivities, hiding the body support like an awning, others lie prone upon the ground, or knuckle down

kneeling or resting on their elbows, as grotesque as an old olive yard and nearly as human in expression; these and a thousand others might be named. Then, their natural distribution on the landscape is always an interesting study; it so often reminds you of the grouping of a vast concourse of people on some festive occasion, when, *con amore*, reposing on the lawn at the picnic grounds, the free and easy social laws of life assert themselves for tacit acquiescence, neither asking nor tolerating arbitrary human enactments, for her eternal laws are the same in leasts and lasts as in greatest and first principles, the ever unchangeable; and because they bear this highest seal of a divine philosophy, are always "charming, as is Apollo's lute."

The expression of this pastoral oak is that of calm rural repose, little or no agitation of leaf or limb, but a peculiar peaceful stillness, rest—at all times gentle, tranquil rest. As all objects in nature have their spheres, so have the oaks theirs. Few, we venture to say, can be found who have not had some experience of the exhilarating effect of the odor of oaks. This enspiriting ether is eminently characteristic of the deciduous species, although in a degree, common to all, especially is it noticeable at early dawn, and after showers. The sanitary influence of these aromas, aura-bathed, and every way breathed is to furnish the essential ethereal food of the brain and purer body, as the grosser chyle does that of the crasser body, their companionship is therefore altogether worthy the periodic pilgrimage to the sweet woods, and the primeval camp beneath the fragrant and revered ancestral oak—

"That fills the liberal air with lavish odors—
There, let me draw, ethereal soul; there, drink reviving gales
Profusely breathing from the spicy groves and vales of fragrance."

To dwell on all the natural objects at home among the boughs, or the parasites and epiphytes that grow on this or any other oak, would be to write a volume; in a word, any one who can intelligently pass the academic oaks, is well nigh ready to graduate. In order to distinguish clearly one species of Live Oak from another, or even varieties of the self-same species, a task always more or less difficult, let us carefully note a few particulars so as first to fix the Field Oak type; then lay some stress on a strong point or so, of striking difference, and finally, apply our facts to use, the first and final end of all knowledge.

The young twigs, it will be observed, are short, hairy; the large, and larger, in a state of vigorous growth, smoothish, of dull leaden hue; the general color of foliage, dark green; leaves broadly egg-shaped, less in size, oval, somewhat heart-shaped at base, often only obtuse; texture rigid and parch-

ment-like, the margins shallow spinous holly-toothed as many others are; very convex above and rather smooth, becoming of a dull lightish leady hue or faded out on drying, and no finely netted veins; vaulted below, the main mid-rib not usually a single continuous leader from base to tip, but divides, spreading above like the tree itself, which, in some lesser sense they represent, often hairy in the forks, its stem short, etc. The loose tags of the male flowers, longer than the leaves, six to ten stamens. Female flowers with three to five long recurved styles, or recurve spreading. Acorns on young, *this* year's growth, and therefore annual (or sometimes holding over and ripening the following year, or rarely having both old and new year's together, also blooming again wholly or partially in September and November, all at one time.) Acorns solitary, in pairs, or clustered, set nearly close down on a thickened pedestal; cup obconic, or turban-like, rather deep, often purplish or beautifully rose-tinted, and satiny-silky within; acorn oblong, gradually narrowing from base to top or long pointed; woolly inside the shell, little, abortive, bottle-like ovules near the top, outside the skin of the meat.

The timber is stronger than our white or black oak (*Q. lobata*—*Kelloggii*) and many others; the twisted fibres are so interlaced at the bifurcations, gnarled roots and elsewhere, that its strength of resistance is truly tremendous; with due preparation and care in seasoning, ranked among the best of the black oak section; of its durability less is known; as wood it does not burn like "blazes," but gives out a graduated heat well suited to domestic purposes, makes lasting coal, and the bark, the best of all slow gentle fuel. Misinformed Eastern friends record that it makes miserable timber and even poor fire-wood, speaking of the tough interlaced fibres *when green*; *when dry*, as the wood chopper well knows, it splits free and clean, reversing the usual order of experience in such cases. It is certainly the best kind of fuel known, save only manzanita—it even burns tolerably well green, but much better seasoned. In short, the only sound and sensible objection to be urged against it is its scarcity.

The golden west of the Pacific gives rare opportunities, if not the best, for the study of sylvan habits. Here we witness the widest range of variations in form, and the greatest extremes in size, often in very close proximity; the self same species is seen dwarfed from a lofty tree, to a few feet or even inches, each equally fruit-bearing; such observations tend greatly to disturb preconceptions, and remove prejudice, and so enlarge the area of freedom to our sylvan ideas, at least. This may be illustrated anywhere in the vicinity, and somewhat in the city limits of San Francisco; *e. g.*, this Field Live Oak in Lone Mountain—large trees two feet in diameter

etc., with their spreading branches quite in contact with their dwarfs when a lee amphitheatre guards and shelters the one and exposes the other. While we must pass by unnumbered lichens, mosses, and kindred plants, it would be too great an omission not to notice a few of the most conspicuous. Of all the epiphytes that gem or grace the oaks none can be more interesting than the elegant Lace Lichen (*Ramalina Retiformis*). This festoons the branches from a few inches to several feet in length; the meshes of this lace or net work, vary from half an inch down to the finest possible little knit mits or glove-like expansions—often perfectly bewildering for multitude and for masses; color, gray verging to bluish, here and there studded with white shield plates, or tiny saucer-like discs, on which the spore-seed is ripened. Although no spell of natural oak may now capture the fair ones to dwell therein all their days together, as in legendary lore, now literally rendered—yet no fairy fingers ever wove prettier lace to while the passing hours, or hung on the outspreadings of the oaks choicer emblems of genuine interlacing scientific truths, for these are, after all, supereminently, the real interwoven garments, needle, and lace work of the soul. On half shady hill tops and wind ridges the great bat-winged *Sticta* (*Sticta Menziesii*) stands out from the bark half or nearly rounded, often hollowed and somewhat pitted and plaited—vaulted like an ear, studded with dark shield-like fruit. Mosses also abound, but one only must suffice—we allude to the exquisitely beautiful Golden Chenille Moss (*Hypnum Nuttallii*) in softest, closely clinging broad cushion-clad patches, the flattened feathery spray spanning abroad in long radiating lines during the wet season, fruiting earliest in winter, and during the long dry season rising, in-curving and involuting its leaves into the brightest golden chenille cords you ever saw, fit to garnish the dress or gild the crown of a queen.

This half evergreen oak sometimes partially dismantles, a portion of the leaves falling off in Winter, or becoming nearly quite bare in Spring just before the young leaves appear; others altogether retain their old leaves, without any flowers or young shoots, *i. e.*, resting over an extra season to mature and nurse the young fruit already set the previous year. This *agrifolius* oak—probably a printer's immortalized mistake for *aquifolia*, or Holly-leaf Oak (?)—extends along the coast southward through Southern California into Mexico. Some of these trees in the southern part of the State are enormous for size and horizontal spread.

CALIFORNIA BLACK OAK.

(Quercus Kelloggii.)

—
"There is a beautiful spirit breathing now
Its mellow richness on the clustered trees."
—Longfellow.

THE finest typical Black Oak of this coast! It most reminds you of the Yellow Dyer's Quercitron, Black Oak of the East (old *Q. tinctoria*), altogether in growth of body, branch, spray, and leaf. The tree is forty to seventy-five feet high, seldom over one hundred; two to four feet in diameter, rarely over eight, only a few of them furnishing two or three saw-logs of clear lumber; in general they are too short, because when the lower limbs die—these limbs are usually short and small—they are apt to leave their dead pin-knots in, spoiling the timber, for they do not, as usual, trim themselves by a natural law, cutting off within, and by growth pushing the dead pins out, and thence righting into line the errant grain; such loose knots are apt to fall out, leaving holes in boards, etc. While speaking of the timber, it should be noted, that, like the Red Oak (*Q. rubra*), it abounds in sour sap, of which it is very retentive, and dries slowly, but if this is abstracted by soaking, or even by seasoning well, it makes excellent axles for truck wagons, buffers for cars, and for a vast number of useful purposes. Some of these trees in the higher inter-vales of the mountains, between three and four thousand feet of the most prosperous belt for this State, it often towers much like the Scarlet Oak (*Q. Coccinea*), and the Red Oak, spreading their branches from near the middle and above, not counting the short horizontal pin-knot branches below, giving the tree an oblong outline, regularly enlarging towards the top, sweeping upwards and outwards, remotely like the elm. Many smaller forms on the exposed hills and highlands, highest and lowest are less handsome. The bark is very rough, and the blackest of all the Black Oaks. The leaves are rather a little deeply bayed by the three principal lobes on either side—a pair of lesser ones at the base—this and that side single, and end lobe, and the side lobes terminate in several sharp points weakly bristle-tipped, about four by six inches, smooth above and below; leaf-stalk one quarter to one third the length. The foliage of a cheerful middle-green, the broad candid span of the leaf has also sufficient length of slender stem for freedom of motion, which gives vivacity

and sound of rustling freshness to the wooing breeze, and this in perfect harmony with the free open-hearted air of familiar access favored by relatively fewer subdivisions of the spray; this hearty expression of home-like welcome, whether decked in emerald emblems of truth, or the good of golden Autumn's yellow leaf, constitutes the peculiar charm of this oak. The above outlined description will give some general idea of this oak, a fuller will follow in the summary. Acorns solitary, or several set nearly close down, oblong cylindroid, abruptly pointed, one to one and one half inches long, about one third less broad; shell horny in texture and color, downy, set in a hemispherical cup, and usually very deep, one half inch or more wide, and deeper still; the flat, closely shingled scales, egg-lanced, rather blunt, membranaceously margined; these are usually close-pressed except where the roots reach an excess of water.

A few trees of this oak are found near the coast; up to six thousand five hundred, it is only a large bush—comes in as a tree bearing acorns at six thousand three hundred. I am assured by other observers that it grows up to seven thousand five hundred, but do not now recall any such examples. The range of this tree is from the southern boundary of the State throughout California to Eugene City, in Oregon. As Dr. C. C. Parry remarks, "there are two varieties which are only distinguishable by the fruit, which, in one, has a large and prominent gland, while in the other the gland is almost concealed by the cup, characters which seem to be constant in the same individuals."

To dwell upon the beautiful and varied surroundings of any one of the trees, would lure us too far away from the present purpose in writing. A word or so of allusion to the ordinary and most common associations must suffice, for examples are multiform.

"The character of the landscape," says the honorable and renowned observer, Humboldt, "always stands in mysterious relation to the soul of man," even in its outmost natural reflex. So, when the glory of Autumn comes down upon our landscape, as with an elfin host rejoicing their farewell thanksgiving in the gayest golden garb of the consummating year, whether in lowland dale, over highland hill, or in the great mountain valleys, what vast ecstatic settings of radiant forest gems! even the poorest, relatively barren hill-sides, become pictures of royal beauty under the magic touch of her wand. Witness the dark-green clumps of Wild Tea-Bush, bunches of brilliant scarlet berries that laden the light-green rounded *Toyon*, forecasting the good Christmas times coming, among abounding bush of blooming gray-green bosses of manzanita, young of the deeper-green Pondrous Pine, all on a ground of black or bright red soil, or the like, and every-

where round about these bright golden guardian angel oaks, holding the four winds to calm repose lest they blow on the earth and on the trees; midway the light, delicate, silvery gray Sabin Pine, casting her gauzy maiden veil over some beauty, far or near. Such is but, a faint glimpse of a very little of one of ten thousand glories that dwell in the land.

Summarily recapitulating—this summer-green oak may be considered as only a middle sized tree of notoriously black bark, characteristically extending even to the main branches. The branchlets soon become smooth, leaves large, three to six inches long, broadly oval in general outline, moderately pinnatifid-lobed or broadly bayed, and these lobes outwardly tapering, like the Red Oak of the Atlantic sometimes; again lobe-toothed and always more or less awl-pointed, in age smooth, leaf-stems slender, about an inch or so long. Catkins (male flowers-stamened), starry-downy, or smoothish; calyx, with five broad eye-lashed lobes, bearing four or five stamens. Biennial, *i. e.*, acorns set in one year and ripened the next season on the wood of the previous year's growth, one to three together, set close down, etc.

CALIFORNIA EVERGREEN CHESTNUT OAK.

(*Quercus densiflora*.)

"O spare that aged oak,
Now towering to the skies."—*Morris*.

A LARGE tree, of great beauty and unusual regularity of outline, being broadly conic, often oblong-conic-topped, and always, if in freedom, the most symmetrical of any oak ever seen. The very wide range in the size of this dense-flowered Evergreen Chestnut Oak is scarcely less wonderful than is seen in its boon companion, our Evergreen Chestnut itself, being from a few inches, or feet, to one hundred and fifty feet high, and to six feet or more in diameter. Throughout the Coast Range associated with redwood forests, or chiefly bordering their vanishing limit, among such colossal trees it must needs aspire with more or less erect-spreading branches, and here is often seen the somewhat spire-shaped top; but with space to spread, the lower and middle branches reach abroad horizontally in the flat fan-sprayed type of the very large Pacific Red Alder (*Alnus rubra*), but so perfect in form that no possible art-training could equal it for true symmetry; the ever verdant leaves

are large, like the chestnut, two to five inches long, one to two broad, leathery, oblong-oval, lance-pointed, rather abruptly acute, or the smaller forms somewhat sharper pointed, base more or less blunt, feathery, veins parallel, margins saw-toothed, rarely altogether entire, save at the base, edges slightly turned back, underneath remaining more or less whitish, and at length tawny-woolly, like the twigs and leaf-stems, although above becoming nearly naked and smooth. This close-set ample foliage so abounds as to render the shade the densest of all oaken shades, and yet airy withal; this is owing, as just suggested, to the rectangular level spread of its numerous limbs and leaves; this peculiar disposition of branch and spray also gives it a seeming openness and freedom, not altogether warranted by the very short, stout, and almost rigid leaf-stem and the nearly impassive blade. The color of the foliage of this tan-bark Chestnut Oak is rather a pale, quiet, subdued green; the conspicuous young twigs and leaves first appear as if clad in a cloak of the finest lamb's-wool imaginable. The illusive appearance is like that of beholding a large tree in bloom; the real blooms, however, are like those of a chestnut, *i. e.*, in long clustered erect aments, or tags, of a creamy white color, densely studded with flowers, myriads of long stamen threads standing out all around like fairy pins stuck in the tag tails. Acorns, one to three or more together, set just below these bundles of tags, ripening the next year thereafter; the cup is often somewhat hemispheric, or flattish, very shallow, and wheel-shaped; scales uniformly loose, rounded coarse-thread-like tips, weakly curved or often bent back, soft and velvety, in short, mossy; the acorn-nut large, oblong-cylindroid, or remotely egg-form, abruptly or broadly pointed, satiny outside and inside of the horny shell, and also inside the mossy cup; color umber, or light brown, a biennial oak, with the clustered fruit on short stems.

As this oak largely marshals among redwoods, cypresses, spruces, and firs, it evidently delights in humid half shady woods and fog-bound coasts; but the finest types we have ever seen are along a region from fifty to one hundred miles or more north of San Francisco, in that coast belt where the fog line vanishes as it greets the dry air of the interior valleys, as *e. g.*, Russian River Valley, and the Sacramento north. Nevertheless it migrates far away from fogs, and even occasionally ascends the Sierras to about three thousand five hundred feet altitude, and extends inland to Mount Shasta and the vicinity of Yosemite Valley, here they seldom exceed a foot or two in diameter, are oftener even only tiny fruit-bearing bushes. The bark, though not altogether smooth, is rather even, and lighter colored than the chestnut, or grayish-brown, the sharp and

deep irregular chinks not much disturbing the surface, except in great age. The wood is straight-grained, rather soft and brash, too porous for staves, except for dry use; great or high artificial heat wonderfully toughens this timber, but if left to itself, when cut in the sap, in the long days of June and July, and the four-foot jacketed pieces of bark peeled off for tanning, then it decays in four to six years. Like the redwood it sprouts up vigorously, and rallies from the stump to repair or reinstate the forest in the wake of the fire or the ax, as well as the best. These pieces of bark spread on their back exposed to the sun soon coil or quill up and dry, are corded and shipped. The general forms, with a few details, have been already dwelt upon, but still among so many uses and beauties it seems a pity to pass unnoticed one of the chief charms of the California Chestnut Oak, lest, freezing the genial current of the soul, her song-birds seek other climes—we allude to the softened lights and shadows that follow with the bending and upturning foliage moved by the wind—a soothing sight eminently tranquillizing the mind, with naught of the grand flash, nor the restless rustle of petty individual leaves furtively vacillating on their own account, but noble, quiet, unanimous masses, moving obedient to becoming grace and dignity. These apparently ever-vernal oaks have also their successive seasons of leafage, Spring, Summer, and Autumn, similar to deciduous trees; they too, cast off those antiquated and verdant emblems of transient truths, for such leaves have already subserved their day and use, so do they return again into their rest, their Winter vigil, though it be less hearty, even less profound than their totally dismantled kindred.

The oak, like the vine, lingers longer in the lap of the mother than most other trees, tardily the buds expand, coyly the tender leaves open their wings to the warm sun; precocity here, as elsewhere, would be no index to final strength nor to lasting vigor. Striking contrasts are less manifest in most monotonous evergreens than in this species, and therefore yield less heightened pleasure in their contemplation.

Most acorns, in their bitter state, are apt to prove injurious to stock. Fortunately, when such fruit first falls, few animals, save bear, hog, and deer, eat them sparingly, and not even hogs, with impunity; but later on they sweeten and are freely eaten even by cattle, beast, and bird. Continuous rains and melting snows abstract the soluble bitter and injurious principles and leave the farinaceous or starchy—in some cases incipient germination supervenes and sugar is developed; other appetizing changes take place. The Indian leaches his in tiny sand cups or on mounds made for the purpose, or he places his buckeyes, acorns, or any nauseous nuts, in

little streamlets, if rains be scant or too tardy. The jay and the woodpecker make shallow conic holes in the bark of trees, driving in strongly the sharp end to prevent the germ from swelling, and so ultimately sprouting, to his or their loss. The water lines are rain guides that soak and lave the porous base, and so prepare their Winter stores for use as well. The bee sucks honey from the buds, leaves, and cups as well as the flowers.

Many thousands of acres of this tan-bark Chestnut Oak, as it is often called, are annually doomed to wasteful destruction by a well known perversion of the land-locating law. "Frame houses"—forgive the scandal—or are they only the disordered phantoms of dreaming madmen? Four posts, or poles, trans-rails, no roof, no door, no window, no floor! These are the ghosts of houses that confront you at every turn along the coast, and serve to hold one hundred and sixty or more acres of land—*i. e.*, stool-pigeon timber claims, or land, timber, bark, and all. Dismantled of timber, bark stripped off, etc., then the "claim" is lifted for another, and so on *ad infinitum*, or until waste and devastation mark their path, with none to stay the wanton destroyer. Were the valuable timber utilized in any way, even by portable mills for staves or the like, there would be more apology to offer in the sight of God and man. Cut in the sap, prone on the damp ground, in five to eight years they utterly decay. They would certainly make dry barrels, and such boxes as communicate no disagreeable taste or odor to their contents. In some instances its timber has proven a marvel of toughness and elasticity. Well chosen and thoroughly prepared, it makes good fellows.

May their perfect shadows never be less; shadows never damp and chilly, as some we wot of, but pleasantly warm and dry. We have before alluded to oaken odors as eminently salubrious, and when their shadows also are of the beneficent and safely refreshing sort, like this, they commend themselves to the ruralist from all points of view. Better breathe the health-inspiring odor of the old open tannery itself, than the close consumptive airs "where people most do congregate." Together with the wide range of this evergreen oak, let us keep constantly in mind the fact, as eminently peculiar to California trees in general, from being one to two hundred feet high, they may and do dwindle down to barely tiny bushes in full bearing, aping their betters, though old enough to have lost all their teeth, and still the leaves rigid, thick, and varnished, as near the north and northwest base of Mount Shasta, at Soda Springs, as Hon. B. B. Redding's recent specimens fully show. The incalculable use of its leaves as food for silkworms, of oak-eating species, will be further alluded to elsewhere.

GARRY'S PACIFIC POST OAK.

(Quercus Garryana.)

"What if my leaves are falling like its own."—*Shelley*.

THIS White Highland Post Oak bears some resemblance to the Long-acorn, or Weeping White Oak (*Q. lobata*), although, for the most part, a smaller tree, of less majesty, and altogether more of the old orchard-like habit; there are, however, a few grand types in the interior of the State—Grass Valley and elsewhere, Vancouver's Island, where we observed and collected it, through Oregon as high as The Dalles, and south along both coast and Sierras to San Francisco, in size ranging from thirty to one hundred feet or more, and two to eight feet in diameter. This oak has the highest northern range of any; here it could hardly be considered a "mountain oak," for its altitude is below four thousand feet, although sometimes so designated; so far as we know its belted limits only extend from coast to foothill, preferring highlands, and leaving, for the most part at least, alluvial bottoms in the possession of the grander and more graceful *lobata*. It is well to bear in mind that trees, shrubs, and plants in general, observe certain lines of common average temperature, technically termed "isothermal lines;" these belts, or lines, are here and there slightly modified by exposures, arborescently speaking, west and northwest, especially with underlying ancient morain, being most of all favorable for trees; besides, altitude as we approach the great Sierra Range, becomes more important, because with similar soils every hundred feet of elevation gives about an inch more average rainfall; the roots also go down sixty to one hundred feet or so, often intercepting much underground drainage from never failing spring supplies, fresh from their alps or subterranean reservoirs; while at the same time there is less likelihood of killing frosts, the atmosphere being drier and relative radiation less. The Garryana Post Oak is probably the least strictly observant of this common law, having, as we have seen, an unusually wide range. Now, the practical import, use, and hence inferences from such data are, that where oaks and other forests flourish on even apparently poor and esteemed inferior soils, of neglected—too often discarded—foothills and highlands, all civilized experience, in Europe, America, and elsewhere, has invariably shown them to be surprisingly fertile and very lasting lands—lands most eminently suitable for orchards, vineyards, olive yards, gar-

dens, and for the most varied and useful culture. Few suggestive allusions must suffice, as they are deemed more apropos to a general treatise than to any one sylvan object; we therefore forbear the thousand local examples that could be cited in proof or illustration from Georgia, Alabama, Texas, California, and all virgin soils, with various reasons that might be given at length.

This Pacific Post Oak reminds us most of the best types of the Eastern Atlantic Post Oak (*Q. obtusiloba*). More even than the Blue Douglas White Oak (*Q. Douglasii*), or any other on the Pacific Coast.

This great arborescent dome, ninety to one hundred feet high, is convoluted into a magnificently spreading top scarcely less grand, if not so graceful, as its pendent rival. The trunk, five to eight feet through, has the bark finely chinked, and frequently transversely cuboid-cracked, in hotter localities. Indeed, there is nothing at all meagre in the Northern, Oregon, or best California forms. The expression and general bearing of the tree may be said to be manly, free, open, and generous-like. True, many of ours are less imposing, being commonly of lower stature, and more disposed to spread abroad. The leaves are large, broader at the end, or reverse egg-form in general outline, but deeply bayed, sometimes cleft-like bayed, never bluish gray beneath, like *Q. lobata*, but the under side, leaf stem, young branches, and long sharp-pointed Winter buds are all clothed with a dense dingy brownish or dirty yellowish starry down, scarcely a little of it seen on the upper side of the leaf; unequal lobes, mostly blunt and short, weakly prickly-pointed; slender tags, slightly soft-hairy; barrel-shaped acorns, in some forms more oblong, often in very shallow cups set close down on the twigs; scales of the cup egg-form at base, with elongated tips, soft-hairy, dense, close pressed; the color of the acorn light yellowish. This Garryan Oak can always be readily distinguished by its rather large, variously, but commonly deeply lobed, thick leathery leaves, and very short fuzzy, downy coating beneath, and by its large—one fourth inch long, or so—sharp woolly Winter buds. As Dr. Englemann properly remarks, one form of *Q. Breweri* much resembles this Highland White Oak, but the strong point of distinction most worthy of note is omitted in the description, viz: the acorns of Brewer's Oak, one to seven spicate, or set up on a single stem from one half to two inches long. This feature is best observed in the young state.

The wood is excellent timber, valuable for ship-building, wagon work, and for a vast variety of useful purposes. The northern forms, and those not too much exposed in dry and burning localities, yield the best timber in size and quality; have darker colored acorns and more elongated, egg-form, or

more cylindroid, *i. e.*, relatively narrower girth, sharper, or not so abruptly pointed, and covered with weak hairs; ours, absolutely smooth; the tree also is more angular, besides the bark of the northern tree is not so very white, is more even, though never smooth. As a general rule, the younger and more thrifty timber bears the best reputation; used for wagon purposes and other rural requisites.

Although the actual Philemons, hamadryads, and, indeed, the oracular oaks themselves are gone, and no nightly torch-pomp, nor Druid priest lead the way to the Mistletoe, (*Phoradendron flavescens*) yet we do well still to heed it, for where it marshals its hosts on the trees, the fen-sucked fogs are stayed, boldly marking the limit of malarial lines, and chilling damps of nightly gloom, with their untimely frosts; this invisible dragon of the abyss often wends his way farther up the ravine, often abroad on the contiguous plain, but the sacred sanitary sentinel hath its brazen tent pitched high aloft in the trees, and he dare not pass; but it gives place to the pure and more genial airs above. Under similar conditions, in like localities, the mistletoe also greatly abounds on the Blue Douglas Oak as well as upon this Garryan Pacific Post Oak.

It extends from San Francisco Bay north to Vancouver's Island, mainly on the sea coast, but occasionally passes around above the head waters of the Sacramento River to the Sierras.

BUTTON-BUSH TREE—RIVER BALL-FLOWER TREE.

(*Cephalanthus occidentalis*.)

A BEAUTIFUL symmetrical well balanced tree, forty feet or more in height, by one to two feet in diameter, along such rivers as the San Joaquin, or such lesser streams as those of Lake County; the best types with a straight body fifteen feet or so, the upper third crowned by a handsome rounded or semi-rounded head, probably some few of these exceed forty feet in height, by a foot and a half in diameter.* The Button-bush, along slow creeks, margins

* These proportions, we are well aware, will strike with some surprise those familiar with the Button-Bush as a small shrub elsewhere, for which reason, a word of general remark becomes necessary. Even the scientific visitor is too prone to consider such extremes as distinct species or varieties, being quite unaccustomed to this wide range of development. We might cite numerous familiar examples—might almost say rules—among the oak, chestnut, cypress, spruce, pine, and bay, etc., besides bushes, herbs, and so on. It is not easily reconcilable with our pre-

of swamps, ponds, rivulets, and springs, may not be more than eight to fifteen feet high in many places. But the River Ball-flower Tree, in all its greatness and glory, all over aglow in white and creamy button-balls of flowers, crowded into little globes of an inch or more in size; the long pistils like insect pins, innumerable for multitude, sticking out all over them; in this spherical head, each tiny floweret is forced into a wedged, four-sided, inverted pyramid; but details apart, they are fragrant as the honey hive itself, and fairly alive with bee, insect, and butterfly life; besides being the fond retreat of the humming-bird, and unnumbered songsters that throng their boughs; often a grand and glorious ornament to riversides and watery regions, from June to Autumn; the joy of the sportsman and the admiration of the foreign traveler, from its singular mode of flowering, and by its flowers appearing at a season when few others are to be seen. These are the natural liveried attendants

conceived ideas of propriety for a wintergreen chestnut (*castanopsis*), to bear fruit a foot or so high, and then see it seven or eight feet in diameter, huge trunk of clean colossal column seventy to eighty feet, thence towering one hundred and fifty feet high; nor an evergreen Tan-bark Chestnut Oak (*Q. densiflora*), one hundred and fifty feet high, and nearly of equal spread, sound, and ramping in the vigor of youth—on the coast—and then find it in full fruitage a few inches to a foot high, among the least of shrubs, near the foot of Mount Shasta; nor a cypress (*C. macrocarpa*) and others, four to six feet in diameter, and only a little way off, in equal fruit, barely two or three feet high; or the Tamarack contorted pine and others sporting in the same way; the Buckeye, or Horse-chestnut exhibiting similar extremes. Think of the California Bay-tree fruiting, a common bush, then furnishing hewn logs seventy-five to one hundred feet or more, tapering from three to four feet to a foot, and others eight feet through, and straight as a line (exhibited at Mechanic's Fair), seen for a thousandth time on coast or mountains only as a respectable shrub, waving elders, etc.

Take another example, to wit: our tiniest of Buckthorns (*Rhamnus croceus*), mostly a lowly matted shrubbing, when flowering and fruiting, the body scarcely the size, nay, often half the size of the quill you write with; yet occasionally a small tree, body half a foot or more in diameter, and that higher than one can reach, and the ample top fifteen to twenty-five feet high; wood as bright yellow or brighter than the boxwood of the engraver, texture of exquisite homogeneity, susceptible of the highest polish for cabinet and fancy work, or useful withal; abounding in crystals of oxalate of lime, makes the choicest strops or hones to sharpen, but otherwise bad on tools, and eminently so on the ax. Again, one most familiar with the herculean *Pinus ponderosa*, the grave *Jeffreyi* form or species (?), would be the last to suspect it of sporting on the shallow shore of similar extremes, but in Owen's Valley, at Casa Diablo Hot Springs, it is little higher than one's head, where we reached up from the ground and plucked the cones, and yet a few yards off, at exactly the same level, were trees one hundred feet high. Similar remarks apply to *P. Torreyana*, etc.—on the contrary, it is just what we are prepared to expect of *P. tuberculata*, because so familiar with groves of it laden with cones, only a few feet high, on white magnesian hills; a little larger on the wind-buffed coasts, but near Mount Shasta, east, southwest, and north, one hundred feet high, quite reversing the habit of the Tanbark Chestnut Oak above referred to. Truly, conditions must be very congenial or otherwise—say variable—to produce these surprising contrasts, not a tithe of which can be enumerated. Our excuse for this general note of even these, if any were needed, is seen in the absolute necessity for due allowance being made respective observers and the writer, as well as for climatic and other environment, and for these reasons we see plainly why absolute measurements appear to be of so little value.

that graciously blandish their charms before us, while they serve to introduce us to the living fountains that spring high up among the mountains, or rivulets that run among the hills, or meander the hotter intervals, that loiter more leisurely still through fruitful vales, along lowland leas, to tranquil bay, or to the great peaceful ocean itself.

The branches often shoot straight up from large trunks borne down by floods forming a kind of secondary deformed tree, but in the broader, stiller waters of larger streams, the erect sound body is every way perfect, and the branches spread gracefully, arching outwards into the most regular forms of beauty. On recent shoots the bark is a live-green to roddish bronzy, with a few brown dots, in age becoming lighter or clay-gray; the body-bark splits and spreads into cracky, rough diverging fissure-spaces, frequently covered with mosses and lichens. The shoots are tough and pliable notwithstanding the large pith, yet the older wood is soft, light, and brittle. The leaves opposite, in whirls of three or four, broadly-oval or lance-like, or oblong-egg shaped, very entire, acute base, and sharply-lance-pointed, smoothish shining-green above, lighter netted and downy on the veins beneath; texture rather tough and leathery, three to five inches long, about two broad; the leaf-stems half to one inch long, stipules leave their scars between the insertions above.

To note the flowers more fully, the globular heads on round stalks one to three inches long, from the axils of leaves, in terminal sevens apparently, but really in whirls of twos, threes, and fours, just like the leaves; tiny calyx, short, green, tubular, silky-hairy, four-sided, and ends in four lobes or rounded teeth. Slender, almost thready, flower-tube twice as long as the calyx, the four rounded teeth segments tipped black; threads of the four anthers attached to the throat. Seeds similar to sycamore.

From the Cinchona or Peruvian bark alliance of this Pond Dogwood, as it has also been named, it would be reasonable to expect the bark, especially of the root, would cure fever and ague, it is accordingly celebrated for this purpose; and, also as a valuable bitter tonic for obstinate coughs, and in the treatment of external sores, etc. Flourishes well around springs and in good garden soils freely watered, of course; a fine ornamental shrub, of celebrity abroad, where it is prized in the green-house.

GOLDEN-LEAF CHESTNUT.

(Castanopsis chrysophylla.)

"Timber of chestnut and elm and oak,
And scattered here and there with these
The knarred and crooked cedar knees."
—"*Building the Ship*," of Longfellow.

IN any other country than California, the truly colossal character of the best types of this great evergreen tree would excite astonishment. One hundred to one hundred and fifty feet or more high, five to nearly ten feet in diameter, forty to eighty feet clean trim trunk, and very little taper—for at length in age it becomes massive and towering, like sequoian cypresses—bark more brown, with scarcely a visible tinge of gray, the chestnut-creased channels of it sweeping down like a vast fluted Corinthian column, with only enough water-line divergence to break monotony, bar out the formal and bring to its aid the varied and cheerful. The tone of the tree in general is always dignified and elegant, or grave and venerable—crowned with a wealth of noble, laurel-like leaves, top coned, oblong, or domed in an ever living, rich and royal mantle, golden-lined. This tree may yet, ere long, meet the eye of art—pen or pencil, rural or arboreal, for there are many gems of the *genus homo* abroad in this land, it is a pleasure still to know, who have the harp-strings of their hearts already attuned to joyous impress, when Sylva blandishes her beauty before the footlights of nature's grand oratorio, anon chaunting worthy songs to their sense. With such congenial companions of the wood, let us wander and view together this lofty Chestnut o'er the landscape gleaming! May it be a morning without clouds, when the early sun, from his golden urn orients the east, and, rising from his rosy pillow, greets a radiant morn. For where else in the wide world can we inquire so well how the noble Golden-Leaf Chestnut returns the glad salutation from mountain or hill-top, on landscape or lawn, as of the vivid and veritable witnesses of that thrice sacred Delphic shrine of one's own experiences.

As the suggestive specific name implies, it is derived from the common observation that this foliage, when stirred by the zephyr, rolled by rising winds, or lifted by the stronger breeze, turns the golden under surface to the sun, reflecting a softened sheen of rich orange-yellow, strikingly contrasting the general ivy-green, and lighting up the face of its

foliage with a cheerful smile. Besides these transient moods of sympathy with passing events, it hath, moreover, later on in the season, more abiding features: when the tender shoots and young leaves put themselves forth, they appear clad in yellow down of the cygnet, or in golden velvet; these hold the attention effectually and steadily to its true characteristic expression. This latter quality, seen from a distance, awakes a charming illusion, as if the beholder were reviewing a magnificent evergreen tree clad in golden bloom.

Another forest tree, alike illusive to the distant eye, occurs to mind; we allude to the dense-flowered Chestnut, or Tanbark Oak (*Q. densiflora*). A similar large sylvan companion of *castanopsis*, and for the most part the typical tree, is found among redwoods, or near by, and in similarly tempered belts of coast or moderate mountain ranges. These young twiggy tufts are of an almost pure velvety white, against a lighter and duller green background. This, like the chestnut, is a choice landscape ornament, simulating it in general symmetrical outline, although the oak is of somewhat more open and spreading habit, and especially so in isolated trees of open grounds; is also an evergreen, and claims close botanical alliance with the chestnut; but the leaves are toothed on the margins, and has the large, well-known acorn with mossy cup, whereas this tree of which we treat bears a prickly chestnut burr, with rather hard, brittly-shelled, subtriangular sweet nuts, about the size, texture, and quality of the common hazel. But to return from this parallel digression, deemed advisable by way of contrast, and because so many are apt to confound these two very distinct trees, thus leading to confusion and, as we have known, to controversy.

Whenever brought into cultivation this will make a magnificent ornamental shade and shelter tree for certain fog-line localities of the State, and for foreign climes of similar requirements. Besides, for valuable timber it should be observed that the wood splits straight, and about as readily as its eastern relatives, is nearly as soft and easy to work in the recent state, yet becomes very hard when dry from age or proper seasoning, such as soaking, boiling, steaming, etc. As seasoned stuff it planes and polishes remarkably smooth, is glossy, lightly yellowish or golden tinted when varnished, and valuable for cabinet work; it is also found to be very tough and elastic, and therefore highly prized by the wheelwright, shipbuilder, and for many mechanical purposes.

The ripe fruit, which sets the preceding year, appears simultaneously with the flowers, from August to September; catkins strictly upright, one to three or four inches long at the extremity of the twigs; leaves seven to eight inches long by one and a half inches wide, dark green above, golden yellow, densely scurfy, beneath; margin entire, thick, and

leathery; burr horrent, with divergently radiating spines, from murex-like prominences; nut subtrianguloid, shell hard like the hazel and about the common size, but rather more pointed.

The *Var. Minor*, a Chinquapin form of bush, bearing fruit, from one to six feet high. By the way, this native or aboriginal name is of curious and very suggestive origin. Indian traditions say it was derived from some shipwrecked (Chinese?) Asiatics, who, on seeing and recognizing these American shrubs as like their own species, called them "Shin-Ching-Kang," corrupted "Chinquapin." We have seen this Asiatic species, and a similar one to our "Chinquapin Oak" (*Q. Chinquapin* Max.), the former a true castanopsis; also a larger oak quite similar to our common *densiflora*, and of like use—*i. e.*, for the food of their invaluable quercophogus silkworm (*Saturnia cyralina*), formerly known as a bombyx, the silk export of which amounts to over sixty millions of dollars a year, and only raising two crops a year in China, whereas in California we could raise at least five, without any artificial heat and far less care, and even that, simply the light labor of women and children only, thereby more than doubling the annual income of every farmer, ruralist, or laborer in the land. Also feeds greedily upon *Ailantus glandulosa*, or Tree of Heaven, etc., besides the mulberries, the Japanese being the best.

MADRONA TREE.

(*Arbutus Menziesii*.)

"Before thee stands this fair Hesperides
With golden fruit."—*Pericles; act first, scene first.*

WHO will solve for us that most marvelous sylvan mystery of the Pacific coast? We allude to the almost universal neglect of the magnificent ever-green, Madrona, the finest ornamental forest tree of the continent, unsurpassed for grandeur and varied beauty. Let us consider its just claims for a moment. We have at our bidding a lofty tree fifty to one hundred and twenty or one hundred and thirty feet in height, four to eight feet in the smallest diameter, and some few over ten feet, often with huge limbs two to four feet through, horizontal spread of at least seventy-five to one hundred feet, and at either the main forks or kneed base, transverse sections would give us solid

planks of ten to twelve, or even fifteen, feet, suited to rival old King Arthur's round table of world renown. So might these memories pass along to future ages afar, commemorating a noble race of forest trees, swiftly passing away, condemned to the rural *hades* of our homes—their moloch fires, or the funeral piles of our fields—a burning shame to this foolish, wanton, and wicked generation. Blessed oblivion, draw thy darkest mantle o'er this page of our early history! But if no such boon is vouchsafed us, let us alone, for we will turn our backs upon the vandals, lest we seem to countenance the accursed manslaughter, and be arraigned before the bar of future judgment as in some sense accessory. Come, then, and we will consider it together, as it stands unmolested in the paradise of its delight, fresh from the hand of the Great Croator. Seen in native haunts, on alluvial lands of the coast, or amid other forest trees, we behold it straight and trim as the most fastidious could wish; when young, easily domesticated, trimmed, and trained to any form desirable; later on in life, broad, massive, grand, and supremely picturesque; at home on foggy coasts, with fierce winds, yet preferring due shelter, rejoicing on dry hillsides where fogs vanish and the soil becomes relatively barren; and even on burning peaks, ever clad in rich foliage of living green, equal to the most majestic magnolia. Other trees may sleep in quiet, waiting the return of the wild song bird and the renewing breath of Spring, but love's highest emblems never sleep; ever on the alert, she is awake with the new year, bringing gifts to the dear ones and good to all living. Laden with shagreened orange and red berries, the most beautiful the eye ever beheld, surpassing the choicest strawberries, sweet, nutty, and delicious to the taste, she sub-tropically overlaps the rolling year with ceaseless glory. Anon, the sweet breath of her flowers, now in bloom—April and May—greet the sense, fragrant and exhilarating as odors wafted from the happy isles; busy bees, emblems of untiring industry and its natural delight, literally swarm these nectared urns, with butterfly, and flying thing of every wing, a countless host that phone their ecstasy to the listening flowers all the livelong sunny hours.

"Nor undelightful is the ceaseless hum
To him who, musing, walks at noon."

These white and blushing blooms peep over the dark green background crowding their clusters into view, or bashful and half concealed the whiter and purer bells hide beneath the shade. It is thus she modestly droops her pretty heath-like clusters, cheering the vernal months. How neat at all seasons! changing her dress as custom requires—yet always

elegant, caressing the eye, ever suing for admirers, exfoliating bark, or laying off a few superfluous leaves in the hot months of July and August, the most strikingly picturesque tree of all the groves! Limbs now out fresh, smooth, and soft as an African's skin—yea with the most exquisitely freshened green, tender, and delicate as any maiden's, fair tablets to carve "Rosalind" upon; the very sight of which is like inspiring a sweet zephyr, just astir, breezing from out some cool shady grove, when the traveler is faint and weary. Even the fading foliage falls unobtrusively down, as comes "still evening on" in twilight dews. Fading foliage! did I say? Nay! the beautiful leaves brighten like celestial hopes above into every shade to hallowed gold and royal purple in exchange for the natural green of earth. So also the sea-green surface beneath, yields to a softened mellow-white, no artist could cease to admire. With such a sheen the enlivening shade, is by far, the most cheerful that ever bore that name before; myriads of bright and gay reflectors spiriting it away; meanwhile, shedding "their sweetness on the desert air." Our feet never pressed her half-dismantled robe without a feeling akin to entering the neatest ladies' parlor in the land. Instinct with the feelings of the great chief, we are fain to echo the eloquent apostrophe * * * "the earth is my mother, I will repose on her bosom!" With uncovered head and due reverence in the presence of orderly nature, we are oft' prone to tarry beneath the beautiful boughs; and may we say it—always leave with the lingering regrets of a lover. Returning anon! behold the pea or sky-green bark changed to deep orange, burning red, or sober cinnamon brown, out of due respect to autumn, and the fashion of the season. How strange the view! What marvel of moods! Fascinating by every art that could please with ever-varying beauty; could imagination, fiction, or fancy portray to itself a sylvan object more wonderful, more chaste, or more charming?

Why then, it may be asked, are so few of our surface artists found who give adequate prominence to this marvelous middle and foreground tree? Yet how exceedingly apropos to their purpose, and so characteristic, too, of Pacific scenery. Yea, altogether lovely on the landscape, faultiness in form every way—in the bold bossed knee base, sturdy body, rivaling the oak—huge branch and strong arm; full of native character and never formal. Ah, me! again what bark—warranting the highest warm coloring, without the least exaggeration—and such leaf, flower, fruit. Time would fail to note its varied expression, and even to old age and forever, beautifully picturesque. Panoramic details apart, consider it again in one view, that it sink deep into thy soul: Broad magnanimous canopy of large, thick, rich shining or var-

nished-green and tropical foliage, vivid semblance of the Grand Magnolia (*Magnolia grandiflora*) of the South, laden, as it were, with a mass of burning berries; seen in due season, such smooth, red, naked limbs, gleaming from out the opening mantle like the native red man—giant of the wood—stalking the forest with majestic tread, and you have before you the handsomest tree of the west. Like exfoliating trees in general, which have their wood of continuous texture, with little or no separation of porous structure alternating with annual rings of growth, and so are never “shaky” nor liable to split, this timber has a high reputation for furniture—polishes, stains, and works well. But spare us, dear reader, the further merited allusion to its timber. Ghosts of departed sawmills and vandal skeletons, with ax in hand, loom up from “that other place” to haunt the evening of our days. We would rather sit on Madrona’s knees, that resemble those of the deciduous or Bald Cypress (*Taxodium distichum*) of the East, and teach your children the wisdom that shall reverence sylvan use and beauty, that they may offer, betimes, some acceptable incense of affection for the native forest trees of the land.

True, this tree, like others we could name, does not bear transplanting from the wild state well, from lack of the usual number of fibrous roots of many other trees, but it germinates easily and grows freely from the seed. “Why, then, is it not more cultivated?” Nurserymen justly reply: “Because there is no demand.” These, and other tree seed, should be put on the ground so soon as possible after the first rains, and nursed and sheltered from the sun.

Dr. H. Behr presented to the California Academy of Sciences, some years ago, a peculiar web, sent to him from Arizona by Baronet Koels; these webs were the product of a caterpillar of a butterfly (probably *Euchera socialis*), which feeds on this *Arbutus Menziesii* during the rainy season, and protects itself in those webs against storms and other inclemencies of the weather. As these webs are impervious to water in the liquid form, but let it pass through in the state of vapor of perspiration, they would furnish water-proof clothing without accumulating the perspiration like prepared silks, rubber goods, etc.—and, withal, exceedingly light and elegant. The cultivation of the insect would develop a valuable article of export, amounting to millions annually.

EVERGREEN HUCKLEBERRY.

(Vaccinium ovatum.)

"How calmly sinks the parting sun! Yet twilight lingers still;
And beautiful as dreams of heaven, it slumbers on the hill."—*Prentice*.

OF all the formal symmetrical beauties of the Pacific coast, none exceeds the Evergreen Huckleberry bush; but why is it that these native beauties never fail to strike the stranger with admiration, while the average Californian is so seemingly indifferent? Familiarity can scarcely be pleaded, since few are able to recall them at all, perhaps being more devoted to a tour of observation, may account for it, as in other respects we are not inferior to them in appreciation. This shrub is usually five to ten feet high, mostly with numerous spreading branches and hairy branchlets; leaves thick and leathery, smooth, dark green, shining, somewhat egg-shaped, acute pointed, an inch or so long, and about half as wide, often also narrowed at base, margins with sharp teeth; these leaves are set close together and nearly down on the twigs; the pink and white flowers, tiny, pitcher-form, in dense, short, axillary, and terminal racemoid clusters—they are nearly or often quite hid, and pending beneath the sheltering wing-like arrangement of the leaves, or only coyly peeping out here and there, to blush in the genial sunbeams; whenever it is found flourishing along shady or half-shady borders of creeks, its overspanning branches arching above the steep banks, in strictly two-rowed foliage, horizontally arranged in due order along each side of the fan-sprayed twigs, as it were, in the act of soaring, this never fails to attract our attention and win our admiration at all seasons of the year. And yet still more is this joyous impress of heart enhanced by the very pretty early spring blooms that modestly gem these graceful boughs. The fruit is black and varnished, edible, but the best quality are more pulpy, and these are usually covered over with a dense blue bloom; the varnished variety are apt to have a tougher skin and drier berry, and are therefore less delicious. It is, indeed, very doubtful if we have any Huckleberries equal in quality with some Eastern Blueberries. Authors speak of the fruit as "insipid," perhaps because they have only eaten it on the cold, damp coast; ten to twenty miles inland, or anywhere along the vanishing fog line, the fruit is much better.

THE RED HIGH HUCKLEBERRY (*V. parvifolium*) is also much sweeter inland than if growing in too dense shades; these leaves are oval, oblong, obtuse at both ends, not crowded; stems angular, foliage in Autumn apt to become bright red. There is a white fruited variety, but the common typical color is coral red. This makes a delicious and brilliant jelly.

THE LOW RED HUCKLEBERRY (*V. myrtilloides*), is another smooth, sharply angular, densely cluster-branched, about two feet high, leaves more crowded, ovate acute, entire, or scarcely ever an obscure tooth. Fruit, large, red, and sweet. The flowers of these are small from axils or scale-like leaflets, and recurved on the stems.

THE FAR WESTERN HUCKLEBERRY (*V. occidentale*).—This is seldom seen over two feet high, and for the most, is only a very low shrub, measured by inches; smooth stem; leaves thin, light gray-green on both sides, the form varying from oval to oblong, spatuloid, obtuse, or acutish, etc., rather obscurely, being one half to three fourths of an inch long, about one third as wide; flowers mostly single, oblong egg-form, the mouth, like the calyx or cup, four-toothed; berry small, blue with bloom, sweetish. This lowly bush, often unnoticed in Spring and Summer by the transient visitor in search of sights and mountain marvels, nestles among the rocks, in steps and damp patches of the steep gorge, here and there; also bordering shallow margins of lakes, stretching far up the entrance, or down their outlets; or, we behold them marshaled in extended marshes, where they accompany sphagnum mosses and such like vegetation as clothes the pseudo lake in its transitional state to the mountain meadow. Unobtrusive hitherto, yet when Autumn comes down the alp, it then boldly paints the landscape in gorgeous hues of gold and royal purple, or scarcely less varied the beautiful tints than the great bow that spans the cloud when the sun smiles benignant to the heavens, weeping for joy! The artist, true to nature, is wont to transfer their high coloring to his Autumn canvas, glowing and burning from out the softened haze. Then comes the censorious critic to question his veracity, having been so often appealed to directly, or plied with questions of skeptical import, whether really any such low Autumn-tinted shrubbery existed, and if so, what? It is but due to say this is the principal painter of the dingle-side and mountain meadow margins when Autumn's benediction is on the head of the mountains, and his yellow hair falls softest and haziest among the hills.

CALIFORNIA STORAX (*Styrax Californica*).—This is an ornamental shrub of five to eight feet, rarely fifteen feet high, and sometimes gregarious, like the Hazel (*Corylus rostrata*), and of similar size and general appearance, only more upright. The leaves are egg-shaped, often broadly so, and rather blunt at both ends, always so at base, but sometimes slightly sharpened at the top, margins entire, and set on short leaf-stems; in Autumn tints of bright yellow it simulates young poplar bushes seen a little way off, but closely inspected one sees more or less of starry, soft wool. The soft, downy, and chastely white flowers are exquisitely charming, like expanding eardrops, usually much larger than those of the snow-drop or Silver-bell Tree (*Halesia*), and of similar form, but few in the clusters; the pretty contrast of the ten large bright orange anthers render them, in a high degree, handsome; thus, as these short racemes hang from the tops of the twigs, another grace is added to beauty. The flowers are succeeded by a single globular seed, like a small nut, nearly half an inch in diameter, set in the thin burr-like calyx. This kind of half-hazel envelope has a close short downy nap or outside coating. When sheltered, the whole shrub itself becomes more graceful, for where it is much exposed it is apt to become rather too rigid. Not the slightest trouble is experienced in domesticating the California Storax, as no ordinary slight neglect or rough treatment seems to do it any harm at all. Does it not appear very strange to say that such an interesting and altogether available shrub, well known for nearly half a century, is not yet introduced; Mr. Ellis, at the State University, alone excepted. This is another native floral companion of the Service tree before noted, yet with a much lighter green, thin, and delicate foliage, more definitely localized flowers, hence the general and striking contrast.

THE LOVELY WILD SYRINGAS—MOCK ORANGE (*Philadelphus Levesii*, California variety, and *P. Gordonianus*).—Among the vast concourse of May flowers, the Mock Orange bushes display their large, frank, and chaste bridal blooms loveliest of the lovely. Grandest and fairest of these forms is *P. Gordonianus*; ten to twelve feet, openly spreading, arching, and waving their ample wreaths, fragrant as the happy Isles at respectful distances; but for too great familiarity it hath little odor of affection. Perched high, as we often see it, a crown of glory upon heaven's own sacred earthly altars—isolated rocky heaps—whereon no profane hands of self-derived intelligent work were ever lifted, nor their cold iron withal; surrounded, too, by the neatest native lawn your eye ever beheld. What wonder, then, the lone beholder, coming suddenly out the dark tangled wild-wood, should stand rapt in

ecstatic delight, silent and still, breathless, or tacit, ravished by unwonted beauty, soothed by sweetelysian incense; nearer approached, it glows, living and sensitive in the fond and reverent eye of love, ever gentle, tenderly fearful and reluctant lest it mar the tiniest twig, yea, the chaste bloom of thy youth. These shrubs are too nearly one and the same species, "with variations" as the musicians play it. The leaves, like the branches, opposite, egg-form, or only a little elongated, attenuate-pointed, nearly entire or toothed on the margin, two or three inches long, half as wide, and variously nerved. White flowers, from an inch to an inch and a half wide-spread, rather loosely clustered, and more or less leafy at the base. They reflect a warmer and gayer light than the Snowy Medlar (*Amelanchier*), and usually appear a little later on, when lengthening days bring more abiding heat.

THE PURPLE HEATHLING (*Bryanthus Breweri*).—Few me-morials from the alpine regions of California can equal the charming flowers of the dwarf evergreen Heathlings of the high Sierras. These tiny erect, hardy shrublets are about a span to a foot or more high; body usually about the size of a quill, branching at or near the base; the upright branches tipped with somewhat long plumey clusters of rose-purple flowers—these terminal racemes two to four inches long, each flower half an inch or more across, wheel or shallow saucer-shaped, rather deeply five-lobed starry margin, filaments, anthers, and long pistils alike purple-dyed, the eye-like center, bright white to yellowish, and most cheery; the gayest of all the heathers; growing chiefly in peaty *debris* or black rich humus of leafy compost, among rocks, or, at least, beside the transient rilllets of melting snow-drifts at from seven to ten thousand feet and upwards on the summits of the Sierra Nevada Mountains. The branches very far back are densely clad with linear, obtuse heath-like leaves one half to an inch long; flower stems a little sticky-glandular, and the odor fragrant as the Isles of Ceylon. Truly appreciated mid its spring surroundings, and what can be more soul inspiring in those serene heights where it blooms nearest akin to celestial beauty; the charming law of unity in variety we see everywhere impressed on men and things, and this forever makes the ceaseless music of the spheres above, below, abroad, extending far * * * hence the myriad associations of whose genesis we know very little, yet in returning affection and with retrospective and introspective thought, we both feel and do know, that they are oftentimes so wedded with the order of nature, and ourselves, the better part of it, they will come back hand in hand fit companions of our past, if no others, perchance, of the vast throng who also commune at her altars.

So also is the song of the little White Cap (*Parus montanus*), that seems to say, as it sings, "O-o-o, see-e-e, the pretty, pretty, beauty;" the soft andante, and the slightly lingering stress on the second note, to the attentive listener, is soothing in the extreme; then the ecstatic distinctness, or precise dwelling emphasis on the final note, is of that peculiar sweetness of affection, as if the dear one had a very delicious sugar-plum under its tongue. Early thus do these woodlands resound, and the alpine shrubs respond, every ear is fresh, every song new, therefore is repetition now no longer monotony, but the ever-charming voice of love.

BRIDAL BOWER BUSH. (*Carpenteria Californica*.)

"Is she a nightingale that will not be nested,
 'Till the April woodland has built her bridal bower?"
 —Meredith.

A new and beautiful native evergreen shrub allied to the Mock Orange; foliage narrower, thicker texture, like some forms of willows, but much more densely set; or speaking more specifically still, the leaves are lance-formed, rather thickish or leathery, entire, and the margins slightly revolute, whitish underneath like the olive; opposite leaf-stems slightly coherent and sheathing the twigs, usually two to three inches long, barely half an inch or so wide. The flowers pure white, fragrant, two to two and a half inches in expansion; tiny bracteolate leaves, ovate, sharp, not "subulate," only quarter of an inch below the flower, central flower stem none. The flowers arranged in flattened irregularly distributed masses successively blooming.

The flowering season is about the middle of May, continuing with a succession of blooms for a much longer period than their only Summer-green relatives. A charming hardy shrub six to fifteen feet high, heartily commended for purposes of rural adornment.

TINY SIERRA HEATHER (*Bryanthus empetriformis*).—This is also another elegant little Wintergreen Heather, still smaller and more branched than the Brewer's, being barely a span or so high, tipped with a cluster of rosy-tinted somewhat tubular flowers, pitcher-like, pursed at the mouth, as in the manzanita, arbutus, and huckleberry-bells, and these flowers elevated on naked, or only gland-studded thready-stems, modestly drooping above the erect densely plummy heath-like foliage, emeraldizing the branches far down below. A choice ornament for the alpine garden, beautifully adorning inter-rocky spaces of the Sierras at about eight thousand feet altitude here, but further north, coming down quite near to the coast level.

CALIFORNIA SWEET SHRUB (*Calycanthus occidentalis*).—This is an upright shrub, four to twelve feet high, brownish below, pale cherry red above; leaves large, or about five to six inches long and two wide, oblong lance-shaped and sharply pointed, often rounded or slightly heart-form at base, margin entire, rough, lightish green alike above and below, on very short leaf stalks; blooms from April to November; ripens its fruit well; flowers purplish, the numerous thick, fleshy, strap-like petals or flower leaves an inch or more long; a soft bloomy hue heightens the delicacy of the surface. This rather madder-brown hue often becomes tawny or a little bleached at the tips; the odor a very delicate fruity fragrance. These successive flowers are at length followed by an oblong thimble or beer-glass-shaped seed vessel, rough scarred and veined on the outside, smooth and satiny within, and at maturity, unlike the Eastern Atlantic, open at the top. These little erect cups, mounted on stems a few inches long, contain numerous loose and rattling raisin-seed-like bodies. These tiny fig-formed seeds, one fourth of an inch long or more, have a most elegant silky-velvety coating, as if finely bedewed. This very companionable shrub is usually found herding together, by multiplying from creeping roots. They delight in sweet well percolated declivities of rich and often rocky margins of gulches, or lesser ravines, on short primeval rivulets of hills, or, for the most part, contiguous to living springs. Valued for rural culture.

GOLDEN VENEGASIA (*Venegasia carpesioides*).—A stout, very verdant perennial or half-herbaceous bushy shrub; very showy indeed, with abundant golden, or rather brilliant lemon-yellow flowers, blooming nearly all the year round, very bright and cheerful; their gayety in the half-gloomy cañon is rendered still more brilliant against their own dark green leafy background; three to six feet high, much branched, and spreading into a rather symmetrical clump; allied to the chrysanthemums or Christmas daisies. They adorn the distance, but are scarcely at all suited to the bouquet. Its natural habitat also is suggestive, for it flourishes the very finest display in sombre glens and half-shady woods, or perched on the brink of gloomy cañons, or on the sides of the precipice, where the sun rarely shines; here it lightens up the lone surroundings with a radiant glow of glory wonderfully enchanting. For similar purposes it is well worthy the attention of florists.

THE QUEENLY CASSIOPE HEATHLING (*Cassiope Mertensiana*).—This tiny, delicate, moss-like winter-green shrublet, of a few inches only, with scale-like leaves overlapping in four rows and so altogether on the square, and the flowers pure

white, of broadly open bell form, four or five lip lobes, only lightly scalloped, and sufficiently out-turned for character—save the pretty pouting—more modestly nodding than even the fair-famed violet, on slender thread-like flower stems, the prettiest, broadest, and relatively largest flowered of our loftiest highland heathers—size of large peas. This is by far the most modest, neatest little belle that ever bloomed; more divinely chaste than classic goddess ever dreamed, the very perfection of all the tiny floral beauties that ever blossomed outside Eden; to other eyes, as to our own, the highest conceivable type of artistic taste, nay, angelic, yet supreme in simplicity, and such of its kind as no natural human eye ever saw its eke. And why should it not be so? Preëminently placed on the most high mounts, serenely above all else, at twelve thousand feet or more aloof from the sensual depths of those dark seas below; and now, as then, and forevermore, commemorative of the chaste wife and all pure virgin souls, ever serenest in pensive beauty, most elevated in purest purpose, meekly enthroned the fairest symbolic queen of all the virtues, emblems of exalted honor, types of the purity of truth, born of the highest mountains, cherished in realms of purest ethers, garlands of the prettiest alpine gardens; naught of earth can awake such pure delight as the fairy Queenly Cassiope Heathling of the snowy Sierras of California.

In all our walks with orderly nature, even in the presence of the conspicuous and more obtrusive beauties that gleam and glow far and near, lofty or lowly, the charm is always heightened by the humble that fill up the measure of natural delight, each playing its own harmonious part well in the grand orchestra that swells sublimely heavenward in the lofty notes of the great *Sequoian Cedar* and their alpine congeners, or more tacitly thrills magnetically along the lesser hills of our humanity adown the fruitful vales to the utmost extremes that make glad the very last and least fibre of earthly existence. These reactive types of objective nature everywhere, higher and highest things of life, are the natural parables of Him who never yet spake to man without a parable.

CALIFORNIA ROSE BAY (*Rhododendron Californicum*).—Of all the handsomest, most showy, arborescent shrubs that adorn the wild woods of coasts, mountain forests, or the habitations of men with blooms of superior splendor, magnificently mantled in evergreen foliage of great elegance and dignity, few, perhaps none, excel the *Rhododendrons*. Notwithstanding ours is a noble species, from eight to twenty-five feet, or even more, one fourth to a foot in diameter, we believe it has not been introduced hitherto to any extent.

Very few of the larger size have altogether escaped periodical fires, are too often well nigh in ruins, bearing broad and lengthened charred records of past peril adown one side, and so were rejected by Mr. William Clarke in aid of the California centennial contribution. It is worthy of passing remark that this species often grows on high coast ridges, and on the borders and bluffs of cañons or precipitous gorges, where only red or yellow loam abounds *without a vestige of peat*, showing that atmospheric humidity, or moisture, to some extent, from precipitating fogs on the half-shady coast, or shady banks of mountain streams, among oaks, firs, and the like, fully suffice for its prosperous growth. However, here the largest specimens flourish in soils of rich local alluvion, mixed with recent leaf and other debris, answering to peat, associated with enormous briar stems, ten to fifteen feet high, two to four inches in diameter, stout enough for one to climb—we allude to the splendid Red-flowered Salmon Berry (*Rubus spectabilis*). The flowers appear from June to August, in large, terminal clusters, condensed racemoid-umbels; color, a delicate rose or pink, broadly bell-shaped; border, five-parted, and lobes wavy-margined; throat, brown-spotted above, but none on the two lower-lip lobes; ten unequal stamens included, etc.; leaves large, about six inches long by two wide, elliptical lance-like, base usually slightly wedge-form, on short leaf stems; texture thick and leathery, shagreen-roughened and softly lustrous green above, beneath whitish and very finely net-veined, etc. Among the Rose Bays we find a white-flowered variety, equally evergreen, and in essential particulars agreeing with the type. Extends from California through Oregon to the British Possessions. Deserving cultivation abroad, for there seems little hope at home.

WESTERN AZALEA, OR THE GREAT PACIFIC HONEYSUCKLE (*R. Azalea occidentalis*).—A large summer-green shrub, ranging from three to twenty feet high, and several inches through, say two to four inches in diameter; grayish flaky bark in age, usually smooth; leaves slightly spatula-form or somewhat wedge-base, sometimes lanced, always tender, very soft hairy, especially on the margin and beneath, becoming rather shiny-varnished above; the flowers appear long after the leaves, those of the coast nearly clear white, or only with a softened broad band of delicately shaded buff-tinge on the upper lip or inside; this bright, chaste, and cheerful white is greatly heightened by the light-green background that brings out in radiant relief the copious masses of flowers. As mementos they cannot be well preserved, on account of their viscid-glandular quality sticking them into such confused heaps in the book. As found on the mountains, or

along mountain streams of the interior of the State, or farther south, they are often tinged with rose or purple, rarely yellowish; the whiter forms of the coast north are by far the most impressive beauties known of all the Azalea section. We have seen a brilliant scarlet form (*R. Azalea calendulacea*) in Alabama, more gay but inferior in queenly grandeur. Associated with these Woodland and Swamp Honeysuckles, the sweet seraphic reëchoing numbers of the warbling wood robin, hermit thrush or mavis (*Turdus musicus*) of the East, still roll on in ever reminiscent harmony with the passing years, so the Honeysuckle here, associated with its own little song thrush (*Turdus Pallasii*, var. *nanus*), both these odors and those notes, though fainter and feebler, again awake to living reality past affections for the fragrant woods—albeit as celestial echoes from off that other Pacific shore—for nature hath also her sweeter subdued songs for the musive soul; her wind-spirits that sooth with softer wings, or murmuring low, whisper and sigh for serenest realms afar.

The lasting and delightful fragrance of these boughs hung among clothes no moth ever invades, and the plague is staid.

FRINGE FLOWERED ASH.

(*Fraxinus dipetala*.)

"Through whose broken roof the sky looks in."—*Longfellow*.

ALTHOUGH the common Oregon Ash has a mellow green, loosely expansive leaf, and open general airy shade, apparently flowerless, so inconspicuous are they, yet the white Fringe Flowering Ash of California has a much lighter colored and smaller leafleted plummy spray, more impassive foliage, and an altogether more open and airy top, through which the cheerful sunbeams play upon the lawn in flickered light—the shadow of a shade. When in blossom, the leaves are more mobile, and the twigs graced with a wonderful wealth of white line-like petals pending in effusive pannicles of fringe, which renders it most strikingly beautiful. The tree is much smaller, say twenty to thirty feet high, eight to ten inches in diameter. Smooth in leaf and twig, the feathered leaf two to four pairs and an odd one, or five to nine leaflets, rarely three, and these an inch or two long, oval or slightly oblong, margins saw-toothed, at length leathery; on very short leaf-stemlets, panicles of

white flowers, as it were, poured out, and in pretty profusion cascading the twigs with their tidy, graceful falling fringes everywhere adorning her mantle. Separately considered, each flower consists of two petals, one quarter to one half an inch long, on short claws from a minute cup, scarcely visibly four-toothed; the short stamen threads and anthers, two to four, about equal in length. Fruit, narrowly spatulate, oblong, one inch or so, mostly slightly notched at the end; base, sharp-edged, and in one form wing-margined to the base, with broader obegg-form ash-key; found further south, this has but three leaflets, quite exceptional to the common California type.

This pinnate or feather-like foliage, unlike other kinds of Ash, takes on autumnal tints of prevailing yellow, as the wild woodlands are wont, in the beautiful sylvan sunset, when their day draweth nigh unto its close. Then the little leaflets oft fall away from the main mother stalk, parting at the joints; they seem, however, less unanimous in their final adieu.

The Fringe Flowering Ash, as we have seen, is of such small size and great beauty, light but ample foliage, and delicate shade, rounded top, slightly body, cheerful bark, dry upland and hill habit, inland and occupant of hotter vales, and every way so well suited to adorn rural walks, and outside landscape; it would really seem that the neglect to cultivate it, hitherto, is more due to want of requisite knowledge than to proper appreciation.

We have not dwelt upon the value of the timber specifically, for too little that is reliable has come to our knowledge.

OREGON ASH.

(*Fraxinus Oregona*.)

"Welcome, ye shades of Ashes wild; along the dale,
With woods o'er hung— * * *
Whence on each hand the gushing waters play."—*Thompson*.

THE principal Pacific Ash of California and Oregon is not in general quite so large as the Eastern White Ash (*F. acuminata*) of the upper Mississippi Valley, but relative to diameter is taller and more elm-like in elegance; the branches here are seldom huge in the oaken or Eastern ashensense, but the divisions above are upright or erect-spreading aloft, into easy-sweeping, plummy-curved branches, a few of the lower only reaching moderately towards the horizon, with

spray but slightly pending. A tree seldom over eighty to one hundred feet high, two to three feet in diameter; foliage, though large, flexible, loose, light, and soft; as suggested, the top rounded with shorter, lower branches; the fruit greatly resembles the Eastern White Ash; bark not so white, but clayey-gray, rough, and the water-lines elliptically spread or superficially gaping; large branches much smoother, lesser branches and twigs smoothish, save the sparse scabrosities, white dotted. The pseudo-compound oddly pinnate leaf of five to seven leaflets, at length from soft hairy, they become more or less rough (*scabruose*) throughout; opposite, the leafleted divisions almost stemless, except the terminal odd one, set on a winged leaf-stem about one half an inch long, broad pear-form or obegg-form, obtuse, or often abruptly a little sharpish, the base broadly wedge-shape, margin entire, or with rarely a few scolloped shallow teeth, nearly smooth above, and finally scratchy-rough, especially on the margin, and beneath, as well as sparsely along the common leaf-stalk. The leaf usually consists of two pairs of leaflets, and an odd one, leaflets jointed at their union with the common long foot-stalk, the buds rounded; flowers in opposite fascicles near the ends of twigs from axils of last year's growth. The fruit cylindroid, like a grain of rye, from a minute four-toothed calyx (cup), marginless at base, but gradually margined upwards into a spatulate flattened wing or key, often slightly notched at the end; whole length one to one and a half inches long, less than one fourth broad, rarely three-winged.

The foliage is among the last to appear late in the Spring, when the Signal Ash becomes the advance guard and guide to the florist, that he may now trust his tender plants abroad in the open air, for Jack Frost's Spring departure is thereby announced. He is also first to ground his Autumn uniform, to warn him to return them to their Fall and Winter shelter, for Jack's sinister approach is again suddenly sensed on some balmy Autumn day, when floods of yellow light pour their ripening rays over his worn mantle; "presto, change!" and instantly, all brown and sere, as it were, scorched in the battle fires, they fall away. Thus the "Martial Ash" promptly responds to the great roll-call, and retires from active duty for a season on his parol of honor. That much of this harmony and concord everywhere abound in spirit and nature's laws all mankind are prepared to expect and to heed. The leaf of the oak, when of the size of squirrel's ears, is the Indian's calendar for the best corn-planting time, budding of birch for barley, far north, etc., each relative to their own clime; birds of passage have their calendar of exit and return; insects theirs, as the food of plants and flowers come and go; the fish of streams, lakes, and the great and wide sea, and whatsoever passes through the paths of the deep,

have their favorite haunts and holidays; wild beasts of the lonely forest desert their accustomed ranges, when no coveted mast is on the trees, long ere the usual harvest arrives; the sun, moon, and stars, and all the hosts of heaven, have their times and seasons; indeed, all nature, from Alpha to Omega, from which laws the wise will ere long listen and learn. The great dial plates of the heavens and the earth, both point and signify, calling and echoing each unto the other—celestial and ethereal, air, earth, and ocean—the sweet music of the spheres. Thrice blessed the hearts that feel, eyes that see, ears that hear, and they who understand.

The Oregon Ash, noted for nothing ill, time would fail to detail all the good uses in its way in the world. The wood is white, easily worked when green, tough, light, very elastic, strong, lasting, famous fuel, excellent ashes, best smoke for hams and herrings; serves the armorer, soldier, and archer, coach and carriage-maker, cooper and cabinet-maker, ship and wheelwright, machinist and farmer, and if there be any other use indicated in the arts, trades, and manufactures, we ask their pardon for the omission, for this species equals nearly all human emergencies. Have known its use for rheumatic and other pains—leaves rubbed on swellings caused by bites of mosquitoes, serpents, and stings of bees; to remove pains, itching soreness, etc., affords instant relief; antidote to the Lamb-kill (*Kalmia augustifolia*). Why the English and foreigners should prefer it for tanning, in certain cases, we do not know, but presume there is some good reason.

Found in rich moist bottom lands, along stream banks and marsh borders, from Fresno (Ash) County, along Coast Range north throughout Oregon, and to a great degree, California.

Nuttall's Pacific Box—The Great Flowering Cornel.

(Cornus Nuttallii.)

"The glory of Lebanon shall come unto thee,
The fir tree, the pine, and the box tree together,
To adorn my sanctuary—
And I will make the place of my feet glorious!"

—From the sublime poem of *Isaiah the Prophet*—Sec. lx, 13.

"Ye nymphs of Solymy, begin the song—
To Him sublimer strains belong;
O Thou my soul inspire

Who touched Isaiah's lips with hallowed fire!"—Milton.

WITH the great serene redwood-cypress, or colossal cedars of the coast, as they may well be called, grand and ever-vernal fir trees, yews, spruces, pines, oaks, and others together, beneath and among them all by far the most magnificent sylvan bouquet of California or Oregon is the great Box Tree of the Pacific. No floral denizen of the forest strikes the stranger as so impressively bold, grand, and gay as those chaste white blossoms, one fourth to nearly half a foot across, well distributed over a tree twenty-five to seventy-five feet high—nay, eighty to one hundred in some rare instances.* Body of relatively small diameter, ranging from ten inches to two feet; bark dark red, verging to black, very finely and evenly cuboid-checked. The surprise when suddenly confronted by this bright sylvan bouquet is even startling, save to one long familiarized to charming native forest scenery; and few, if any, of these can be found so indifferent to a proper sense of the beautiful as not to, ever and anon, reawaken, renew, and full oft increase their admiration at each recurring Spring. Like the bright shining after May showers, so also is our own delightful experience and observation of the effect of this choice tree amid the wild woodlands. In general outline it is oblong-conic, and, as usual, in age of more roundish top; the relatively naked spreading branches with somewhat open, upturned, purplish-green, rather stout twigs; they have the opposite foliage, chiefly condensed; and rosulately radiating their tip ends; these large—four to six or more inches long, and three and a half to four wide—broadly elliptical leaves are feather-veined or nerve-like, sunken above and prominent beneath, the texture of the blade thin and tough, somewhat abruptly sharp-pointed, often broadly wedge-form towards the short

* Sect. 4 CK. Mendocino County, J. Clarke.

leaf-stem, the brief scattered hairs turn back, and are more or less close-pressed above, rather more confusedly half-woolly beneath, and the hue lighter grayish-green, "gloaming the twilight grove," changing again in mellow Autumn sunlight to gold and royal purple. From the end of these final branches, supported by a stout foot-stalk, one to two inches long, are set the large white involucreal flower-leaves, four to six in number, two to three inches long, and half as wide, nearly like the proper green leaves, but often notched at the end; these are what appear like great petals, and go to make up that grand floral display we behold, but the true florets are at the eye-like center, being too small for casual observation. Here also at length appear the spherical heads or bunches of bright scarlet berries, one hundred and forty to one hundred and fifty, of which, fifteen to thirty mature, or say, usually about twenty-five, here they crowd and nestle, emblazoning with livelier cheer the somber Autumn shades; separately they are tiny, say half an inch long and about half as wide, oblong-egg like, abruptly black tipped, commonly so compactly crowded together as to become quite angular; these very ornamental clusters are even largest and brightest red in the dense secluded woods, and there only rivaled by the brighter scarlet and purple foliage shading to iris yellow; forests by no means solitary nor deserted, but only quiet, as it were, far from the common walks of men; here we may read undisturbed, if wont to peruse any page of the great book open before us, perchance know, here and there a few floral, sylvan, or other famed characters of her living alphabet, if not technically, yet to all intents and purposes, truly, so as to begin to combine them in the order of her harmony, or at least to appreciate them when so combined; then, what if these trees climb some tall, steep glen side, bow low and lean off the precipice, becoming picturesque, quite athwart the narrow defile, or spanning the mirrored brook, arching up over, shooting high the tented top that beautifully ombowers the pools below. Here the frisky gray squirrel, pigeon, jay, and other wild game are wont to seek them out for food, and later on, they glow upon the ground, and gleam or glimmer in the beds of creeks, from beneath the cool waters, where the speckled trout sports, and the playful 'coon roves at large up and down the deep retired ravine; along these banks and bars the watchful wildcat, couchant, springs upon the great salmon trout left by receding floods; there are the pretty martin or mountain cat, mink, and the fisher, there also roam the bear and the lion seeking their prey, and here the sly fox and prowling wolf find their favorite haunts, and the nimble little lank redwood deer oft returns to slake his thirst, besides unnumbered beasts and birds that retire to these romantic shelters

for refreshment, and for rest. Thus doth natural scenery with its ever varying associations "unadorned" by profane human hands, leave freest play to refined edenic pleasures, "where no vile surfeit reigns," and no weariness of wealthy display obtrudes, where the ostensible and artificial humbly acknowledge their peerless real. But would any one, in this conceited age, have the audacity to imagine a real philosopher (truly loving wisdom, rather) soliloquizing, "This natural object, and that, or those scenes combined, impress all variously, and forever will, as now, along the rolling ages, effigies of the Infinite; hence, indefinite, a very small part of His works, the views of passing human ephemera, the least of all His wonders." But soon the balmy days supervene, silently signaled on forest foliage, as stars of honor on the breast of worthy merit, when the year, and all his types, draw nigh unto their quiet close; then a saddening retrospective repose comes down in floods of yellow light embosoming wild and lonely wood, languid fields of harvested plenty, serener mountain tops, more tranquil vales of fragrance, softer winds fan our cheeks, and expiring zephyrs sigh faintly æolian songs, echoing the firmament of the pine and the fir from on high, with the "still small voice of silence," wherein celestials whisper unto the soul, saying to the all-attentive ear, "Yonder is a brighter harvest in the skies;" earthly flowers may fade away, gay leaves fall lightly down, or as bright banners of a vanquished host, lie scattered and prone along all paths of hasty flight. But already the buds of promise appear beside the fruited fork, between the final two parting twigs of the Great Flowering Cornel—another life begun, for death is but the beneficent beginning of a new resurrection.

"Life is real! Life is earnest!
And the grave is not its goal;
Dust thou art, to dust returneth,
Was not spoken of the soul."

THE GREAT FLOWERING DOGWOOD of the Pacific, like its kindred of the Atlantic, is also of slow growth; wood hard and heavy, texture close and color dark, takes a fine polish, called native Boxtree, the timber being often substituted for boxwood for joiners' tools, handles, and turnery generally; makes elegant mauls and mallets, is beautifully ornamental when well selected, best near the base, and with instepp-root furnishes good knees, similar to cedar, pine, oak, and yew, good boxes for gudgeons, and cogs for wheels; young, straight stems, hoops, etc.; and in the "good old primitive times," long gone by, when female, from queen to peasant, and the "old folks at home" were wont to put forth the hand unto the distaff, the orderly disposed branches whirling the

slender stems furnished that implement for the spinsters. The very bitter aromatic bark affords an excellent tonic, astringent, antiseptic, and febrifuge, and like peruvian bark, is of like efficacy, yields cornine as that does quinine, salts of similar medicinal value; smaller branches for stick brushes are used to render the teeth extremely white; the smaller roots yield a scarlet dye, and the bark has been used for tanning. Found along the whole coast range north to Puget Sound, in Oregon and Washington Territory east into the Cascade Mountains.

WESTERN LARCH.

(*Larix occidentalis*.)

* * * "trees in tears of amber run,
Which harden into value by the sun."—*Ovid*.

OVID also describes the sisters of Phaeton as having been turned into Larches. But by modern magic processes the custom is now reversed, and Larches are turned in phaetons for the sisters of our day; a decidedly delightful improvement on the old plan.

The Western Larch is an open, spiry, star-spangled, deciduous conifer, with short and slender depending branches, with no proper boughs nor sprays; therefore, most of all trees, naked, bare, and dead-like in Winter; but if space and air be allowed to encourage and maintain lower branches, they will live as long as the tree survives, to add beauty to the base and more general comeliness throughout; there needs also sufficient shelter to produce the requisite height. Thus, with branches nearly or quite sweeping the ground, thickly set and successively lessening aloft into elongated conic symmetry, the tree is then not utterly spiritless even during the Winter months, as all deciduous trees and shrubs must needs be, more or less. And as all art, especially in architecture and in nature in the landscape, has respect to humanity, at least in some points of view, could the ideal expression be considered complete without these various types of repose and rest—sleep; nay, the lowest reactive symbol of apparent death itself; even bordering upon the dark confines of the real before it burst into renewed life with all its charming and ever changing surprises.

The Western Larch of the coast of Oregon and northern California, where it grows scattering along the banks of streams; is one hundred and twenty to two hundred and

fifty feet high; two to three feet, rarely five, in diameter. In the larger specimens the rather insignificant branches give it an air of devotion to body-timber, like the colossal Redwood (*Sequoia sempervirens*); but this is, to a great extent, characteristic of nearly all the forest trees of North America; only with the Larch and a few other intrinsically tower-trees, perhaps a little more so.

The trunk is strictly straight; in deep gorges, the clean and handsome lower shaft is fifty to one hundred, or in rare instances even two hundred feet, true as a plumb line; consequently straight-grained, and, in respect to this tree, free-splitting. Larch literature is very voluminous, and the uses so manifold, universal, and supereminent that time would fail to even touch the varied topics. Suffice to say the timber is exceedingly tough, light, and elastic; in river, ocean, harbor, earth, and air structures of the severest trials, far excels the staple timbers of the world, such as oaks, pines, etc. Unfortunately this species is never massed in forests, nor thronged in swamps, like the Eastern Tamarack (*L. Americana*). But our Larch loves a due degree of sunlight, pure refreshing air, sweet percolating soil; dry above, so that no night evaporation ever suddenly chills, and where the genial currents of air are swelled and lifted up at night from free, broad, and contiguous vales that share their bounty with the little valleys between, neither arid nor foggy, abounding with moisture beneath, fed by living fountains, or established beside rapid rivulets that keep moisture continually in motion, ever laying lower rootlots, but never drowned beneath floods of wintery rains, nor parched by droughts of burning Summers. But let us return and review her specific characteristics a little more in detail. Little needle-like leaves, long, relative to other species, and very slender, even delicate, radiating in spangles fasciculoid from bud-like rudiments of twigs; potentially designed as such, but apparently falling short in the realization. Thus we see these very narrowly life-like leaves weak and softly starry, light and airy, as it were, verging well nigh upon the unsubstantial, pale bluish-green (closely inspected, slightly keeled above and below); thickened and massed, as they sometimes are, near the middle of the tree, the softened effect is like that of the Great Swamp Cypress (*Cyprinus disticha*). Seen in Spring, decked in pink tassels, like ripe strawberries thrown over the lofty pea-green cone of delicate foliage—if anything so gauzy or gossamery is entitled to the dignified appellation of foliage, in any ordinary sense of the word; but there she stands before you in singular beauty, the veiled Venus of the grove, basking in early Spring and Summer, loveliest of the lawn. Albeit, later on, as the season advances towards Autumn, the foliage becomes more

dingy yellowish green, and at length yellow, when the year garners her gold with the joy of harvest.

The cones are of the size and shape of a pigeon's egg, or about one and a fourth inches long, and about one inch broad, bent back on their short stems; scales of the cones membranous, short, rather broad, egg-form, obtuse, often a little scallop-notched on their edges; bract leaves, imperfectly elliptical, with fringed ends, the long awn or mid-ribs protruding beyond. (See our sketch of it in the VI Vol. P. R. R. R., page 59.)

PACIFIC PLANE OR SYCAMORE TREE.

(*Platanus Racemosa.*)

"The heavy-headed Plane Tree, by whose shade
The grape grows thickest, men are fresher made."—*B.*

—"Broad-leaved Plane Trees, * * *
Where, round their trunks the thousand-tendrils vine
Wound up, and hung the boughs with greener wreaths,
And clusters not their own."—*Southey.*

THE Plane Tree of the Pacific is a summer-green inhabitant of valleys, where the roots reach water, and the soil, free from stagnant moisture, is never dry; with some shelter, access to sun, equable and genial moist air, it is a tree of great magnitude and wonderful majesty; the huge branches spread greatly, and the twigs are divergent and distant from one another, according to the size of the leaves; hence, in Winter it is more open than most other trees to the sun's rays. Pliny says: "There is no tree whatsoever that defends us so well from the heat of the sun in Summer, or that admits it more kindly in Winter." Few trees are so favorably formed and foliaged for ventilation; it is, therefore, no wonder in the Orient they believe, as stated by Evelyn, that, "after a raging pestilence in Ispahan, since they planted a great number of these noble trees about it, the plague has not come nigh their dwellings." Like similar trees of large foliage, they often seem too naked, but how else could they hang out free the pretty tassel-threads strung with long, graceful, and beautiful catkin'd balls, that dance so merrily all the live-long year, chiefly cheering the winter months? In early Spring the great magnanimous and tropical leaves appear; these palm-like leaves are more deeply lobed than the Eastern Atlantic Plane (*P. occidentalis*), being half to a foot and a half across; but they find room enough to expand, and a free Summer-field to flash their bright,

cheerful, and flickering faces along river banks, in fruitful vales, and at the gates of wilder glens; although so open and airy, as observed, the shade is, nevertheless, cool and complete; the milk-white bark so scales off perpendicularly as to become the purest, neatest, and most gladdening tree of all the groves—a cool, snowy, sylvan alp in the midst of the vales! It is, however, only here and there one, or few, among a host of darker trees of the forest, at our northern coast limits, where the contrast makes it the most striking object of the landscape—a perfect marvel of beauty set in such sombre wintry scenery, like a bright angelic visitant, cheering the wilderness and the solitary places; recalling scenes of early days, when the delicious and musky fragrance of the Wild Isabella or Fox Grape (*V. Labrusca*) swayed its long vines pending the lofty boughs, free in mid air, fifty to one hundred feet or more, like the great ropes from the mast-head of a "Man of War." How it ever got there, was the juvenile mystery of those days, when transient thought was lightly turned on the how, the why, and the wherefore.

This, or that, was there, for "happily unconcerned, in the enjoyment of the present, and of the daily bread; or later on, beneath these academic shades reposing, with sundry favorite poets in converse the while, all the live long Summer noonning gloaming, between refreshing lunch and labor, we passed the usual day's duty;" thus are these Plane trees associated in our memories with ten thousand charms; perhaps, to some, 'twere wiser unnumbered (?); indeed, we seldom dare touch, or but faintly and feebly, the harp-strings of the heart *con amore*, save to the innocent and unperturbed ear of childhood. But could the Plane trees tell their own tale, ancient or modern, what poems, what songs, and what profound philosophies would we not have? Planted, as it was, along all avenues, beside all walks on orient or classic ground, near their gymnasia—all public schools in Athens—constituting the honored groves of Epicurus, where Aristotle taught his peripatetic disciples, shady walks of all public buildings, the groves of Academus, in which the vast senso of Plato echoed from the great empyrean of his intellect as he delivered those celebrated discourses. Here, too, the sacred Homer, outcast and wanderer, sang as no other poet ever sung. The enchanted but vain Xerxes must needs tarry beneath the fascinating shades of the sycamore of Lycia, belt it with a ring of gold, adorn it with jewels, impress it upon medals, and leave it in charge of one of the choicest ten thousand. Time would fail to recount a tithe of its lore, even by name, for it has been greatly celebrated from the earliest records of Grecian history, and long prior, in the Orient, whence, not only much literature, but the tree itself, has been imported—nor do any of them yet known equal our own.

One of our charter members of the California Academy of Sciences, the late Col. Ransom, used to relate his own observations while surveying the lands of Ohio, bordering the Muskingum. His party taking shelter from a storm in the hollow of one of those eastern Sycamores—found he could twirl his twelve foot measuring-pole horizontally over their heads; into another fallen tree a cow had entered and housed, forty to fifty feet or more towards the light of a large knot-hole, was too stupid to back out, and the hole was enlarged for her exit. Michaux, measured some of these enormous trees, and found them thirty-six to forty-seven feet in circumference.

The Pacific Racemose Sycamore has an altitude of eighty to one hundred feet or more, rarely over six to eight feet in diameter, the spread often equals, if it does not sometimes surpass, the height; towards the south the foliage is magnificently tropical, it is however, found to vary greatly in size and wooliness. Perhaps there may prove to be two species: *P. Lindernian* and *P. Mexicana* come in beyond the southern boundary of the State, and *P. Wrightiana* in Arizona. Although all our forms of *P. Racemosa*, as at present constituted, are loose, the southern one is certainly most open and tends to spread very widely its divided body; this, in the vicinity of San Diego, its extreme limit is often a smaller tree than at Santa Barbara and those approaching central California; and nearly all of them are closely surrounded by multiplied shoots from the common root, origin of the central parent tree; these trees have a rougher dark brown bark below; it is not known whether they are of equal age, notwithstanding their smaller size. The typical tree when dismantled of those ample palms, and the sparse branches seen so nearly naked, almost bare against the sky, strike one as much more ungainly than oaks in similar condition and even than many other large-leaved trees.

There is here, as elsewhere, often a sudden blackening and withering of the young Spring leaves, as it were, by frost, but young and vigorous trees escape, or at least the central leading top, showing intrinsic and internal vigor, but peripheral weakness of some kind. If not killed outright by this chill (not frost), it is found that season they bear no fruit; this is the mysterious transcontinental "Sycamore blight." The delicate sympathy of the Sycamore for the loss of her sylvan companions is very remarkable; sensitive to sudden shocks, and even slight irregular changes in climatic conditions, especially fitful atmospheric, for it is in a high degree an aerial tree, and requires, as well as helps to maintain, the gentle seasons that tide the rolling year. When these are no longer unified to give a lengthened rest, like a gradual Indian Summer close, into a cool, consistent, well-marked

clime, one nurtured on the bosom of balmy breezes, forested and filtered, sheltered and tempered, duly agitated, aerated, and restored, also softened with wonted moisture, in short, vitalized; so conditioned, it goes forth caressing to health, saying, as saith the sacredly classic love-song, "I charge you, O daughters, * * * that ye stir not up my love until he please, * * * until he come up betimes from the wilderness leaning upon her well beloved." Unlike the Alder nymph, that seems more solicitous of the pure element at her feet, whose sudden withdrawal is her immediate death warrant, this Buttonwood tree, on the contrary, being of more general vitality, repines at its aerial loss as well, but may spasmodically struggle on a weakened and precarious existence for many years; the tree, however, is probably constitutionally, or by its own nature, sound enough, but it is man and his wanton ways that are unsound, cutting off the reserve source of humid and aerial supply, the great forest diverticulum, thereby disarranging an orderly equilibrium and although the plane tree is among the first to feel it, yet neither man nor his useful products are altogether exempt from its baleful influence. As neglect of compensating vegetable life would bring disaster and death into that other fluid of the aquarium, so with all things of the fluid air. This, briefly is our *rationale* of the great north continental Sycamore blight—blight in a tree of all others least infested with fungi, insects, or only frequented by *Phloeodes pustulosus*, and a few others of no apparent harm; or finally, if inquiring into causes thus made manifest, can it be that this classic tree, and age alike, are passing through an age of blight, impending death? If so, we will wait yet longer for the coming philosophic poet to write that epitaph.

For a tree of such rapid growth and great size the wood is excellent; commended for lightness, close homogeneous grain, whitish or faint reddish tinge like beech, and fine silver lines of beauty; these very finely glistening medullary rays resemble beech-wood, but take a brighter polish, yet it is quite too soft to be otherwise compared to it. The lumber requires to be very slowly dried in the shade, so as to avoid rapid shrinkage and season-cracks; sawn slanting, the ray-markings are charming, and the curled grain of the great forks still more so. The clear timber generally is used for bedsteads and other furniture; and as the wood works well and easily in all directions, is fine for scroll and cabinet-work, all kinds of turnery, buttons, clothes-pins, rollers, mashers, etc.; the Mexicans make their wooden stirrups almost entirely of it, for it is light and not at all liable to split; however, for some kinds of furniture it is objectionable on account of warping; it also makes excellent fuel when dry, and for this purpose esteemed for its rapid growth.

FREMONT'S CALIFORNIA COTTONWOOD.

(Populus Fremontii.)

"Some ply the loom—their busy fingers move
Like poplar leaves, when zephyr fans the grove."—Pope.

THIS large tree abounds from the Sacramento Valley south to San Diego and far towards the Sierras, and is said to extend eastward into contiguous States and Territories. Flourishes in rich light alluvion, proximately bordering river banks, or springy, where at least, their roots reach water; is of very rapid growth, and attains to one hundred and fifty feet in height, four to six feet in diameter; bark of ashy-clay color, and roughened chinky on the main body below, lesser branches and twigs creamy; these outer check-sections are so light as to afford a fair substitute for cork. The branches are much spreading, and the general spray of the tree is open and airy, the large leaves serve to form a dense shade; as usual with poplars, leaf-stems about as long, or longer than the blade and latterly flattened; upland form altogether naked and smooth throughout, and very conspicuously bayed at the base; the bead-like cotton pods are arranged on nodding or erect racemes, like currants, usually three to five inches long near the terminal part of last year's growth; seeds white, capsules three to four valved.

For extended parks, avenues, and roadways, and for suitable localities, or cities, this native poplar is the best available substitute for that balmiest of all balmy trees (*P. balsamifera*), that whilom shed its entrancing sweet ethereal perfume, far and near, over the halcyon days of our early youth. The pretty pink-blossomed male tree, only should be chosen, as the female trees shed their cottony seed so profusely, like a flossy snowfall of down that persistently refuses to let go whatever it touches, until the annoyance, to sensitive natures, is voted a nuisance.

The timber is somewhat less white than the Aspen, and on thoroughly drying loses more than half its weight; makes excellent dry goods, wine, fruit, butter, and salt boxes, peach baskets, etc., and all sorts of white wooden vessels, trays, bowls, certain staves, clothes-pins, spools, and similar turner's ware in general; and is at the East now ground into pulp for paper. Is also dignified to use as ceilings that take paint well, and are seldom or never infested by insects; is in good repute for rafters and sleepers where some spring or elasticity is requisite. Its challenged durability when dry,

is commemorated in the old, oft quoted distich of proverbial lore—

"Tho' heart of oak be e'er so stout
Keep me dry and I'll see him out."

And still it holds good. Cattle are fond of the young shoots. Horses are kept in good health by gnawing the logs, and sheep and beaver thrive on the bark; as a special favorite food, mixed with oatmeal, it has been used for human sustenance in times of great scarcity, and for aught any can say, may be again. To the poetic, artistic, and romantic eye, the sunshine ever dances in active glee among the varnished and restless foliage, and some are said to see therein, their fair one—

"As the green poplar leaves in wanton play,
Dance for joy, at rosy break of day."

Others, in graver mood, may apostrophize in this wise:

"Lord! all thy works are lessons—each contains
Some emblem of man's all-containing soul—

And add—

* * * "nor let my love
Among thy boughs disdain to perch and sing."

And—if willing to believe it—a staff, scepter, shepherd's rod, or crook, made of White Poplar in the olden oriental times, denoted the ability or power of good, by suitable natural truths adapted to the state of their flocks, or peoples, to guide them to the good pastures we read of; they also signified and served as supports to their own bodies, hence the universal use by shepherds, judges, kings, priests, prophets, and travelers—as understood in the best emblematic sense—and also in the opposite bad sense, their use by magicians. Rods of the hazel and plane-tree were used in a somewhat lower ideal, or symbolic sense; for all trees, with variety, were emblematic of man's perceptivity, and were so used with due regard to true correspondence, representation, and rightful figures of speech.

This stately poplar is neither so slender, towered, nor so conic-topped as some others, but with rather large irregularly rounded head; the drip and shadow is not injurious to vegetation which thrives well under it. In Autumn the foliage brightens very brilliantly yellow, especially in the higher intervals of the Sierras and the more arctic regions.

VINE MAPLE.

(Acer circinatum.)

"The dying charm of Autumn's farewell smile."—*A non.*

OF all the splendors of forest foliage as seen in the wild woodlands of an American Autumn, no gay and festive leaf can compare with the Vine Maple for brilliancy of coloring or for beauty of form; radiant nerved and glowing as ten thousand little sylvan suns in yellow gold and royal purple, spangling her painted boughs—pretty as an infant's palm—causing the heart affections to leap for joy, as the young roe upon the mountains. Flowers may bloom and fruits blush, brighter berries cluster as rubies and gem the bowers, but these leaves glow and burn brighter still—bright as the rose of Eden on love's own bosom—brilliant as the bow that spans the heavens in the bright shining after May showers.

This large shrub or tree, in California, is seldom or never over twenty or thirty feet high, although said to reach forty in Oregon, and from eight to ten inches in diameter in Mendocino County; bark green when young, whitish in age; it has an arching vine-like habit of, as it were, leaping up and bending down, and wherever the top touches the ground taking root, and so traveling, meanwhile numerous offshoots spring up, interlacing in all directions, forming almost impenetrable thickets or clumps. This natural habit of layering is also often noticed in the Red Swamp or Soft Maple (*Acer rubrum*) and Mountain Maple (*A. spicatum*), and some others, but in none so invariably as this species. Next to the Vine Maple as an Autumnal ornament, is this Red or Crimson-leaf Maple. The common appellation of "vine," is designed to express both the form of the leaf—being vine or grape-like—as well as the vine-like habit of the shrub as to body and branch.

The wood is very hard and close grained—one of the hardest of maples—and takes a fine polish; valuable for minor purposes. The wood is white and exceedingly tough; the young and slender branches make excellent hoops, used by the Indians for their salmon scoop-nets, etc. The leaves are much more heart-shape, sinused, or bayed, than Hooker's plate (*Flora and Forestry of North America*), and not at all palmed by the united veins or nerves at the inserted point of radiation at the top of the leaf-stock, and only seven-lobed (rarely rudiments of two more subsidiary lobes at the inner

margins of the sinus lobes); the canaliculate slender leaf-stem from one to two inches long, about one fourth to one third less than the roundish blade, in Autumn smooth, with a tiny tuft of hairs at the base or center of radiating nerves, rounded heart-shape, deep and gracefully sweeping but sharply cut sinus, lobes sharply lance-shaped, divided nearly to the middle, margin saw-toothed or sharply doubly so, *i. e.* teeth upon teeth; from five to twenty flowers, in umbels at the end of a slender minutely two-leaved or bracted common flower-stem; the velvety cup purple, sepal divisions longer than the green ash-white petals, stamen threads also velvety hairy at the base; wings of the two seeds spread at right angles, about an inch long. Lest the casual observer be confused, it is remarked that there are really three kinds of flowers: First, *male flowers*, with oval crisped petals and no gland at their base, nor trace of any pistil, but in lieu of it a tiny tuft of white hairs—the stamens inserted upon a large orbicular fleshy cushion or gland. Second, *female flowers*, with two styles to the twin germs, which, with the eight imperfect stamens, are inserted on the receptacle, but having five small fleshy glands, at the base of which the line-like petals are inserted. Third, *flowers* with ovate crisped petals, eight perfect stamens, embryonic pair of seeds and only one central style, all on a large circular fleshy cushion or disk. This species also furnishes a sweet sugary sap.

THE GREAT RED ALDER.

(*Alnus rubra*.)

"She loves the purling streams, and often laves
Beneath the floods, and wantons with the waves."

—*Virgil*.

THE common cognomen, Alder, is apt to be associated in our minds with familiar forms on the mountains, or in other lands, and hence signify some sort of bush or large shrub; whereas, this Pacific Red Alder, *rubra* species, is a large and handsome upright tree, forty, eighty, or one hundred feet high, two to four or more feet, rarely six, in diameter; clean shaft, twelve to forty feet and upwards; bark of leaden hue, or lighter whitish and smooth, in extreme age becoming roughly creviced and almost black at the base; the branching portion somewhat elongated-elliptical, or conic in regular outline, except in great age, when it becomes more round-topped; but the usual forms are, in a high

degree, symmetrical; they also maintain their broad leaves so perfectly horizontal, and the spreading branches so nearly so, as to afford one among the finest, most open, and airiest of canopies—what was designated of old as the dense “fat shadows,” beneath which the green grass and the tender herb continued to flourish. They are, therefore, trees, or large shrubs, with alternate deciduous leaves, at first plaited and folded in short stalked buds, and protected by a single scale; aments on branched stalks, the male in long cylindric tags or catkins pendulous; the female cone-like strobiles, short, ovoid, and erect, becoming at length like redwood; cones egg-like, consisting of wedge-form scales grown together, fleshy and abiding, from green becoming ripe-brown, and after shedding the small, cinnamon-brown parsnip-like seed, becoming black and slightly open, not falling off with the seed altogether.

A few of these riverside trees, for variety, in parks, or portions of avenues suited to their habits, and for fringing meandering streams, are remarkably ornamental, and also very desirable on account of rapid growth, for the vigorous vivid green, and evenly distributed verdure, so pleasing and agreeably tranquillizing when associated, like the willow, with its own proper element, and, we may add, equally appropriate for lawn or meadow.

This large Red Alder, in age, also attains somewhat to the bold, resolute, dignified, and picturesque port of the oak, for which, at some little distance, it is not unfrequently mistaken; a nearer approach, however, reveals a livelier depth of green, general egg-form, and doubly fine-toothed, feather-veined foliage, and a much more airy spray. To our mind, there is always a cheeriness of expression, which it seems never to lose altogether, although this feature is more manifest in its early growth and later prime; in short, the general tone of the foliage is at all times of the free and easy sort, and ever “wavers in the wind,” perchance borders close upon the negligent and the careless, more especially so in partially retaining the deciduous leaves so very late in Autumn, or early Winter, when they appear more disheveled, simulating venerable age and its own apparent infirmities, nevertheless well in keeping with surrounding scenery then and there. Alders akin to the birch belong to the few, as we see, who linger long and later by living rills, babbling brooks, or deeper water ways that “go softly;” but at length she modestly retires from manifest view and, deliberately dismantled, rests with the close of the year.

Dwelling only on the banks of living streams; whensoever the Pacific traveler, weary, thirsty, and fainting seeks water, but finds none, deceived by poplars, myrtles, willows, and the like, wont to grow by the brooks, if from afar he

beholds this pinnacle of his hopes towering above the long verdant line of various trees that wind along the vale, suddenly he hails his hopeless or hope-deferred companions with the joyous note of triumph, for lo, the truth-telling tree! "That candid and honest old alder there never lies."

Yonder green tent is ever pitched above living waters—symbol of sacred truth; nor can any false flattering streams lure her above the pure perennial fountain head, where, like the immortal nine, she may forever bathe in everlasting springs. No, nor does the sacrifice of the tree banish the timber. With the more real Naiads of flesh and blood, in the form of washboard, bowl, or machine, they still play there merrily, "all on a washing day." Like the willows, their multiplied shallow roots preserve margins from the wear and tear of aggressive streams, and during the hotter portions of the year, shelter, cool, and sweeten them, and together with the falling leaves, infuse and tone sluggish and stagnant waters. It is certainly worthy of special note, that like most mineral waters, stock always relish these discolored pools best. The flesh of trout, then and there, acquires an alder-tinged color and quality. The leaves are of some repute as fodder, the bark for tanning, and with twigs, tags, and young wood, as a tonic, in teas, beers, etc.; for diseases of the skin, as detorsive and expectorant, and a gargle in ailments of the throat; for ointments, etc.; colors green, red, brown, yellow, and black, and sundry intermediate tints, according to the treatment.

The light soft velvety wood is at first white; freshly exposed to the air, the sappy chips become red; the timber, permanently of a delicate creamy color; the closely interwoven fibres render the texture homogeneous, and its tenacity prevents splitting, although not of the class of tough timbers, which greatly adapts it to such uses as similar woods are applied, viz, sculpture of wood carvers, machinery turnery, and for furniture and cabinet purposes, etc. The knotty parts and roots furnish choice solid or veneered curled ornamental work; previously immersed in mineral springs, it becomes almost imperishable, or buried in bogs of black peaty muck for a few months, with added lime, in these swamp water pits, and then, when taken out slowly seasoned, smoked, and the furniture well varnished lasts for generations, quite unmolested by insects—when long lain in these peat bogs it becomes black like ebony. In a large way it is highly esteemed as piles for the foundations of bridges, and the like water-structures; kept constantly under water in mines, flumes, pumps, water-logs, fishbarrels, boats, and canoes, etc., is exceedingly durable. Finally, among the thousand uses, the long slender fibrous roots, when split, serve for making baskets; but too many good uses have already been noted. Illustrious old Alder! Associated with

childhood scenes and charming by-gone memories of the mines, where we sat beneath her shade—yea, slept and dreamed the happy golden dreams that grosser gold can never buy; bless the good tree! though we never rest under her shadow more—yet her soft refreshing voice still vibrates on the heart-strings of that harp of a thousand,

"Like the whispering breeze,
That lulls on the leaves and dies among the trees."

THE FAR WESTERN PACIFIC BIRCH.

(*Betula occidentalis.*)

"Rippling through thy branches goes the sunshine,
Among thy leaves that palpitate forever;
* * * Thou art to me like my beloved maiden,
So frankly coy, so full of trembling confidences;
Thy shadow scarce seems shade, thy pattering leaflets
Sprinkle their gathered sunshine o'er my senses
And nature gives me all her Summer confidences.
* * * Thy ripple, like a river,
Flows valleyward, where calmness is, and by it
My heart is floated down into the land of quiet."

—Lowell.

THE Pacific Birch is a modest unpretentious tree, delicate, light and airy, spiry and sprightly form and aspect, seldom more than fifteen to thirty feet high by five to ten inches in diameter, extending along the eastern slopes of the Sierra Nevada Mountains of California for many hundreds of miles, around north and west to Siskiyou County, and indeed to Washington Territory and Rocky Mountains, and so southwesterly into New Mexico. In our sparsely timbered regions bordering the sandy deserts, as *e. g.* Owen's Valley region, and there it is found higher and highest, chiefly between four thousand and ten thousand feet altitude. Here it is in much request for a greater variety of domestic and rural uses than some other more valuable timber trees of difficult access. To our own standard of observation, its growth and general appearance greatly resembles the Eastern White Birch (*Betula alba* var. *populifolia*) of old pasture fields, save that the bark at the base often becomes black; is not so purely white above, and the cherry-colored twigs copiously sprinkled with small white resinous warts; slender leaf-stems shorter, hence the tremulous aspen-like motion, though less in degree, is somewhat compensated by a lighter hue beneath; form rather broadly egg-shaped, the fine teeth

gland-tipt, etc. Bordering such dry and arid regions, it is not found far away from the banks of mountain streams, but usually follows along their courses valleywards. The timber is tough, and, kept dry, durable—bezo, birch, and still it is used for making besoms or spray-brooms for rough sweeping, for crates and wicker-work, hoops like the hazel, good for gunpowder charcoal like alder, and for crayons like the willow. We noticed it used for wagon-tongues or poles, for fencing and fence bars, and for sundry other farm, rural, or domestic purposes.

The Far Western White Birch well represents the Eastern in the close smooth bark, which greatly serves to protect and preserve the wood, and is therefore often left on; this property, common, more or less, to all the birches, is most extraordinarily exemplified in the almost imperishable quality of all the sheety or laminated papery-bark birches exposed as roofs, etc., to sun and rain, or even buried in bogs, when it lasts for many thousands of years; in America, at least, never sufficiently appreciated nor duly utilized. In Russia, and elsewhere to less extent, the crude essential oil combined with empyreums from rude earth pits, in the manner of coal-pits, has been long in use for dressing leather by smearing and treating skins designed for the saddle, the book-binder, etc.; in short, these essential oils, oil of cedar, and the like, not only prevent mildew and other fungi, but are known to furnish a large and constant supply of ozone—nature's universal disinfectant and conservator of health—but they also render all fabrics, fumigated, painted, varnished, or in any wise saturated, nearly as durable as the original source whence derived; hence their time-honored repute, and they are still used in Russia and elsewhere, as before observed, for preserving leather, skins, feathers, etc., from decay, mildew, etc.

All birches, together with our own, have long, lithy, delicate twigs, and for aught we know to the contrary, might still be used, as of yore, for juvenile disciplinary purposes. "Bhoorja," the ancient Sanscrit name for an Asiatic species, is by some considered the probable primitive origin of our word "birch." (?) "Book" is from beechen bark, and birch-bark. As usual, with many other trees, when wounded or badly attacked by insects, the normally arrested growth flies off into a set of petty erratic spangles of irresolute twigs known and designated by the Scotch as "witches' knots."

Birches, in general, may be said to express feminine elegance in form, and with the wind merrily at play among the branches, vivacity in action, if so be the foliage sufficiently abounds to redeem them from trenching too closely upon the trivial; but as we usually behold them, when the brightly varnished leaves glitter and sparkle the air with living dia-

monds, and the gentle zephyrs murmur milder music among the birches, there is a sense of cheery glee not easily described which appeals to the sense of sight and sound, and is greatly enhanced by the spicy aroma that so often perceptively exhilarates the inspiration. And when the final farewell Autumn airs come down from their high abodes upon the mount, and begin to sigh their sad adieu over all the glen, the birches don their bright rich creamy mantles and gleam and glow along the mountain vales, every one in his own rank—banners joyfully flying—the closing scene is one altogether charming.

CALIFORNIA WALNUT.

(*Juglans Californica*.)

* * * "Mighty trees—
In many a lazy syllable repeating
Their old poetic legends to the wind."
—*Longfellow*.

THIS tree, like its congeners, is rather deep than heavy foliated; more clouded and graceful than the grosser English Walnut (*J. regia*); not so heavy as the great Black Walnut of the West (*J. nigra*), nor so open, light, and airy as the White Butternut of the eastern United States (*J. cinerea*).

The California Walnut forms a very handsome soft velvety tree, often in age lightly clouded, usually rather symmetrical, with rounded head, not so much storied and tiered, but an exceedingly quiet harmonious tree in its native haunts, or in the vicinity of buildings, along road-sides, in parks or lining avenues; from sixty to seventy-five feet high, about two to four feet in diameter; the dark bark thick water-line furrowed; branches duller gray and never smooth, or only traced and slightly marked where these channels are to be later on in life. The large compound leaves, a foot to a foot and a half long, composed of eight or nine (rarely more) pairs of leaflets terminated an odd strictly lance-shaped one, the other eighteen or more lanceolate-ovate with a sharp elongated point, sharply toothed on the margin, about three inches long. The softened light yellowish-green hue of the foliage is very pleasing to the eye, and its sober contrast with other sharper and more sprightly trees, during the Summer and Autumn months, produces a fine effect. The tree well expresses elegant dignity, but we have never met with it of such proportions as to warrant the title majestic, in a comparative California sense.

This graceful Summer-green tree is mantled like the "Oriental Tree of Heaven" (*Ailanthus*), only more delicately, and equally velvety. In general outline it is somewhat oblong, or about twice the height of its breadth. This long leafage is exceedingly lovely, whether admired as to particular leaflet or compounded leaf, or the general flossy masses umbrelling twigs, and everywhere preserving their curves and the great crowning line of beauty that domes the top. So, also, in every motion, waving to the wind, from the least leaflet to the greater leaf and greatest mass thereof, ever responsive, as it were, with moving tongues of love; for the foliage is by far more yielding than the willows by the brooks with which they congregate, bending in pliant loveliest grace—no rustle, no murmur, quiet as a lamb—fascinating and gentle as the dove of the dawn, or enrapt in ecstatic flight, their wings kissing each other, as saith the prophet. The blossoms tassel the tips of the twigs with long ornamental catkins, two to four inches in length; the fertile females are in a small terminal group or solitary.

The spherical fruit, like other walnuts noted, consists of an undivided husk, from one and a half to two inches in diameter, which gradually decays, after falling, leaving a roundish nut somewhat variable in size, form spheroidal, shell thick and very hard indeed, kernel of sweet nutty fine flavor, surface so slightly vein-channeled, or rather marked, as to be nearly smooth; the meat is thick, broadly and evenly wing-lobed, covered with a dark pellicle of skin; the size and form of the nut varies, say from one and three fourths to less than an inch in diameter. This extreme thickness and hardness of shell preserves the vitality of the nuts for many years. Were they securely stored by squirrels and gophers—or "topers," as the right title is—they would, if kept perfectly cool and dry, last for ages; at least no nut-producing tree with which we are acquainted preserves the perfect plumpness, softness, and sweetness of the kernel like the California Walnut. Should a thinner shell be deemed advisable or desirable at any time, the male catkins can be cut away, in part, if not entirely, the moment they appear, or selections from seedlings which show most markedly a tendency by nature to a paucity of male plumes, and more feminine tenderness of shell, and propagate from those. At present we do not urge either its merits or future probable possibilities, as an edible nut of much economic value. It is, however, worthy to be borne in mind, that the *Prionus* already threatens the destruction of the imported English Walnut by boring the root base and poisoning the sap, so that they often die outright.* Therefore the inquiry may yet arise whether

* We saw these trees planted many years ago, and the barbarous chopping of roots may have been the real predisposing cause.

the native walnut has not vastly superior claims as a suitable stock for whip-grafting and wing-budding, etc., apart from evolutionary vigor, climatic adaptation, and a thousand and one other undeveloped reasons?

In favorable, deep, sweet, strong alluvial soils along creeks and the like, where it finds a good supply of underground moisture, this tree is of rapid growth, which it makes early in the season; its deep repressive shade greatly contributes to refreshing use, quite innocent of any harm often attributed to the continental walnuts, although they all exhale a strong aromatic odor, whenever the leaves are bruised or crushed; this natural exhalation is even given off on hot days so strongly as to be almost overpowering, and to some sensitive persons produces heaviness in the head.

Somewhat rare as this tree is—never abounding in groves—little is known relative to the value of the timber.

TREE POPPY.

(*Dendromecon rigidum*.)

"Sleep, gentle sleep, Nature's soft nurse."—*Shakespeare, Henry VIII.*

AN evergreen shrub three to eight or ten feet high, one to three inches in diameter, with numerous slender branches, and whitish rather smooth bark; foliage yellowish-green hue, often slightly glaucous bloomy, the only woody plant of the Poppy Family (*Papaveraceæ*), and not long ago the world's wonder. Leaves variable from egg-shape acute to narrowly lance-like, one to three inches long, one half to two inches wide or so, mostly twisted on the leaf-stalk or turned up edgewise, surfaces roughened, nerves and veins prominent beneath, margins from rough to slightly toothed; the flowers on stalks one to four inches long, or sometimes set close down; the flower-cup of two sepals, petals or flower leaves usually four, when expanded the flower is one to three inches across; seed-vessel long linear, or attenuated upwards, nerved and slightly curved, and in general like those of the common California Poppy (*Escholtzia Californica*), one and one half to two and one half inches long; seeds globose, rough, pitted, etc. This beautiful Tree Poppy often branches low in the Sierras, and spreads so profusely in favorable localities as to become a massive clumpy shrub, brilliantly ornamented, so decked is it with a succession of even brighter than lemon yellow poppy-like blos-

soms throughout the Summer and Fall seasons, often, near the coast and south, far into Winter and even to the opening Spring of the following year; in these last localities, and on adjacent islands, perhaps there is no season in California when these flowers may not be found more or less abundantly. The very thrifty condition of this shrub, as seen now and then, shows its wonderful capacity for improvement by judicious culture. To ensure success in this enterprise, it is important to observe that, in order to preserve the precarious vitality of the seed, they require immediate planting, or deposition in dry, ashy, sandstone soil, and yellow or white loam with magnesian debris, if possible; they require an ardent sun, little water, save underground moisture in absolutely sweet drainage.

MOUNTAIN MAHOGANY—TWO SPECIES.

(*Cercocarpus parvifolius* and *ledifolius*.)

* * * "her hair
Is like the Summer tresses of the trees."
—Longfellow.

ALTHOUGH the evergreen Mountain Mahogany may be considered as a large shrub, for in this character most of the species mainly abound, yet they are frequently found six inches to two feet or more in diameter, thirty to fifty feet high, furnishing large timber-logs, eight to twelve feet in length, or sometimes more, the smaller end nearly or quite a foot through; the bark brown and shaggy, or somewhat scaly. The largest species (*C. ledifolius*) is mainly, if not quite entirely, confined to the Eastern arid slopes of the Sierra Nevada. This has more the aspect of a depauperated apple tree—if, indeed, the leaves are not too small for the comparison—giving it an air of littleness not altogether agreeable to an artistic eye. Nevertheless, it sometimes becomes a tolerably handsome tree, forty to fifty feet high by two and a half in diameter; leaves thick and leathery, one half to one and a half inches long, one fourth to one half inch wide, lance-like, rough netted, and nearly naked above, margins entire, and the edges rolled back, dark green and shining, but very short close-woolly beneath, mid-rib prominent on the under side, veins obscure; flowers nearly stemless; fruit-tails about two to three inches long, spirally flourishing its pretty plumes, after the manner of the genus. In this, the flowers are from two to six together, nearly close

set down in the leaf-forks. Furnishes the hardest, heaviest, and best wood in the United States, if not on the North American Continent, unless we except the *Lignum Vitæ* (*Guaiacum*), one species in Texas, the other on the Isthmus, which are all that are known to me. The wood is similar in color, dark, almost black mahogany, and takes the fine polish of ebony.

The wood readily sinks in water, as the first cuts of some other trees are wont to do. "As fuel it is worth thirty per cent. more than hickory, the specific gravity of that being .838, while this is 1.117; the ash .52 of one per cent., hickory .81—or three tenths per cent. more." Tables and other furniture have been made of it, but unless properly treated, *i. e.*, by steam, swamp-buried, or mineral spring-bathed, and then slowly seasoned, would be likely to season-crack, etc., as almost any other wood is apt to do when rudely treated. For mauls and mallets, rollers and boxes for the heavy bearings of machinery, it lasts like metal and, although brittle, is much less so than *lignum vitæ*.

The tiny Birch-leaf Mountain Mahogany (*C. parvifolius*), of middle and western California, into the coast range of the Pacific, is rarely more than ten inches to a foot in diameter, twenty to thirty odd feet high. As these larger forms usually grow on or near river bars and banks, or creek borders, subject to periodical overflows, they are apt to be grazed and considerably damaged by repeated collisions of flood-wood, on one side; and from centuries of such exposures apt to be decayed. Sometimes these aged trees exhibit also the charred marks of forest fires; but, to a great extent, it abounds along in Summer-dried upland ravines, even on ridges and high mountain tops, where it becomes reduced to an unpretentious shrub. The little fan-folded and fan-formed leaves are entire and wedge-shaped at the base, feather-veined, toothed only above and at the blunt end, set rather close to the stem in sociable proximity, frequently smooth, often slightly varnished above, lighter and downy beneath. The general effect of the foliage is that of a soft sea-green, or hazy hue, which is greatly enhanced when the very numerous straight, silky tails of the seed, two to four inches long, at first prudishly close-pressed, at length, towards maturity, begin to spirally coil and spread their tiny plumes as softly as the beautiful Smoke Tree. The flowers are rather inconspicuous, one or two of these cup-like and rayless, with fifteen to twenty-five stamens in two to three rows, set on the edge of this calyx-like or real calyx-cup, seen springing from the axil-forks of the leaves; in this last they stand on stalks one fourth to half an inch long, usually bent back. Flowers and fruits from May to July.

The wood, as before observed, is dark-colored, with very

little sap, hard and prodigiously heavy, of exceeding slow growth, trees of the largest size being about one thousand years old, perfectly sound, without infirmity, journeying on with eons unnumbered crowning their venerable brow, and others yet in store; still the beautiful tressed seeds come and go as of yore, prettily spiraling as in juvenile grace, merrily trilling to the breeze, silky softening into mellow haze her curly head, lest the unbecoming twig seem too strict and stiff, or formal and bare, to please the eye or satisfy the taste.

HIGHLAND LIVE OAK.

(*Quercus Wislizeni*.)

"The green abode of life."

THIS evergreen oak usually branches low, is rounded in outline, or erect, spreading, with the magnificent top rolling outwards; forty to seventy-five feet high, two to six feet in diameter, and relatively of less horizontal spreading habit than most other live oaks. Among the usual tortuous limbs, no dead nor decaying branch or twig is easily found, to such a remarkable extent does health and vigor everywhere abound. It is this very clean and neat expansion of prosperous growth above, black bark of the body below, and blackish bark of intermingled branches, together with that darkest, nay, almost black-green densely shadowing foliage, which so much tends to give an impressive and decided character to this tree. The bark on young trees, and thriftier branches of older ones, is more smoothish or even, a shade or two lighter, but always dark, shading to livid. This rough, black, or rarely gray-mixed body is somewhat less chinky than most oaks. Leaves thick, leathery, and rigid (rarely thinner), shining on both surfaces, the upper a vigorous dark green, lower, a shade lighter, inclining to yellowish-green; leaf stems slender, but not weak, usually less than one half inch long, blade flat, except in the young state, and prickly-toothed then, though mostly entire in age, perchance closely sharp-toothed on the same twig, egg-shape or oblong egg-form, sharp and awl-pointed, base obtuse or from blunt, rarely slightly heart-form or quite oval, or again, broad lance-like, seldom or never with jointed hairs in any stage, very short, starry, hairy, chiefly above, finely netted with translucent veins, nearly alike above and below—not that other oak leaves are not also more or less so, in some

states of growth, yet, in this Highland Live Oak, always in a more prominent degree are they roughened and pitted, as it were, with this fine net-work. By this more distinctive and manifest texture of the leaf then, is the Highland (*Wislizeni*) Live Oak discriminated from Field, Cañon, Evergreen, White, and all other Live Oaks, so far as known; even where the casual forms are exactly alike. If any reliable measurements could be made, we should say the leaves were one to three inches long, and about half as wide, rarely less, save in the shrubby forms, however, extreme instances do occur where, in full grown trees, they are reduced to one quarter of an inch; or again, on the same tree, found four inches long by three wide, with every other form known to the querky gamut. The male tags starry-hairy; stamens, five to seven; anthers not cusp-pointed, as a rule; female styles, two to four or more, and long, as in the Black Oaks, to which section this belongs; acorns ovoid, long, acute, on short stems, mostly maturing in pairs the second year after setting, or rarely, one to five on a single stout stalk (peduncle), two or three of which mature, the others seldom attain to full size, one to one and a half inches long, one third to one half immersed in the cup, nut mealy at the sharpened top, to which the long recurve styles are still attached; indeed the length of these styles alone distinguishes it from the somewhat similar Cañon Live Oak. The cup scales are not very sharply lance-pointed, almost smooth, the margin slightly eye-lashed, flat and membranous, rarely in some trees thickened or knobbed at the extreme base of the cup; color chestnut brown; both inside the cup and inside of the shell of the acorn soft velvety wooly.

These impassive oaks with their deep, dark, almost black-green pall of solemn foliage, as it were, night's sullen noon-shadows oversighted and left lonely on the landscape, would be too sombre if in extensive groves, even a minor song of sadness, if in any considerable groups; but as they are naturally and sparsely distributed here and there over the foothills and highlands, the effect is one of commanding dignity—forms the cleanest cut to the very verge of prudish precision—most distinctly defined against land or sky, or mid diffusive haze; and oft' the heated daze that shimmers the landscape of a long hot and dry season, far and near from lowland level to highland hill-top—then are these oaken bowers refreshing as the great shadowing rocks of a weary land; nor are they less sheltering at all seasons. We have seen some fine trees sixty to seventy-five feet high, with corresponding proportions, and spread hanging over homes and out-houses prove famous wind-breaks; arms akimbo, securely indifferent to the strongest blasts of the fiercest storms, even an ordinary whirlwind may wring no branch from his

breast nor garland twig from his honored brow, or none that would leave any habitation at all behind; they stand, indeed, in the first rank of shelter trees. Of him may we well say as the poet sang:

"How doth his patient strength the rude harsh wind
Persuade to seem glad breaths of Summer breeze."

The timber is strong, tough, and very hard, withstands exposure and friction well, is used for wire-cable rollers of steam elevator-cars, and where divers mechanical uses require the best combined qualities; yet people from abroad are wont to report that "a passable wagon wheel cannot be made of California wood, nor a really good one in Oregon." Reëchoed assertions like these are, among those hasty conclusions, we hope to show, not warranted by either careful inquiry or personal observation. Most likely the complaint does not originate from wood on the spleen, or we should be hopeless; only a trivial overweening weakness, but nevertheless it reminds us of the wagon-trials of a wealthy planter of Newton County, Georgia, who kept his teams hauling all the year round from Augusta, to and fro, and was greatly annoyed at the sun-cracking and general failure to answer his purpose of various celebrated eastern and northern timbers. In a fit of desperation he betook to his own woods, cut a Water Oak (*Q. aquatica*), reputed among the poorest oaks, treated it according to his own ideas of fairness, *i. e.*, cutting in dormant state of sap, etc., thorough water-soaking and subsequent slow seasoning; in short, had his own running-gear made and put on the line of summer and winter hauling, and it lasted over thirty years. Duly to appreciate such a test one should be acquainted with the red and black mire and clay roads of that section, the like of which are rarely seen on this earth. Hearing of this we took particular pains to go and see him personally, and obtained a section of the felloe, which we brought to California and presented to the Academy of Sciences. Were not similar sweeping remarks rife on native fuels, it would be needless to say this oak makes first class firewood.

Rarely, a fungus (a *Dædalus*) has been known to attack this all-abounding, healthy, Highland Live Oak, entering scars where limbs are cut away, or natural knots in process of growth, not duly closed over; mycelium following the heart-fibres to those of the trunk and thence spreading up and down, making owl and squirrel-hollows; yet from great vital resistance the progress is slow, long remaining local; but for lasting and important purposes such tainted timber should be avoided.

The shrubby variety (*frutescens*) is common on the coast,

and elsewhere; with much variation the leaves are similar, *i. e.*, at least always finely pit-net-veined on both sides, blade flat, smooth, and clean throughout, etc.; found throughout the State from near the southern boundary along the whole Coast Range, mainly in the hills and highlands and partly ascends the Sierra Nevada Mountains.

CALIFORNIA LAUREL OR BAY TREE.

(*Umbellularia* [*Oreodaphne*] *Californica*.)

* * * * * "Gifted bards
Have ever loved the calm and quiet shades;
For them there was an eloquent voice in all
The sylvan pomp of woods." * * *
—Longfellow.

IN the young state the California Bay Tree is of strictly erect habit; in rich, moist soils, with abundant room for display, as seen by mountain springs and margins of living streams, or larger rivers and favorite rural residences, it becomes a regal tree, sixty to one hundred and fifty feet high, four to six or seven feet or more in diameter; clean trunk twenty to eighty feet. The upwardly spreading top, densely branched in mature age, arches gracefully, and the long, slender, pendant boughs sway stilly as "phantom clouds with moving shadows o'er the meadow." But first, let us consider well some of the natural characteristics of this tree, that it furnish a better scientific basis for the artistic and the ideal, for even Pegasus' foot we know must touch the earth, high on the mount though it be, ere the immortal Nine sweetly sing by the fountains! On a nearer approach the universal yellowish-lucent, green-bronzy hue of the leaves and twigs strike you as peculiar, especially if seen in horizontal semi-translucent sunlight; altogether under the spell of its ever-vernal drapery, you naturally inquire why it is so still, serene, and congenial to revery, to poetry, and to song! Lo, too, the bosom of the great mother is always bare, here beneath her shade, however adorned she may be round about. No man is denied a welcome to rest on his laurels; no animal ever lacks shelter under her shadow, nor wandering bird a home in her boughs; so smooth, soft, and pliant are the deerskin-like leaves, they never rustle harshly, nor startle the listener by sudden commotion, as oak and other similar leaves are liable to do, for their voice is ever "low and still," and, living, dying, or dead, they continually ex-

hale their exhilarating odors to purify and to sweeten the air around them. The form of leaf is exactly that of a lance; blade three to four inches long, from a half to one inch wide, leathery, arranged alternately, flowers and fruit in umbelules (*i. e.*, little umbels) at the twig tips—hence the generic name, *umbelularia*; also, a few flowers below in the axils of the leaves, which have solitary fruit. Ever blooming—as now in November, so in Spring, Summer, and Autumn—nevertheless they fruit in the Fall. Berries oval, about as large but scarcely as long as a French prune, or say one and a quarter to one and a half inches long by three fourths of an inch in diameter, greenish-yellow, or fully ripe and exposed to the sun, purplish; usually clustered in three to five, and at the end of twigs, sometimes solitary; in these, fatty matters abound with the oils, volatile and fixed. Pigs fattened on them yield lard more of the consistence of tallow. A kind of stearoptine, or camphor, is common to all the family of *Lauraceæ*, whence the sanitary odor-sphere of this tree is truly wonderful—to some too exciting for toleration, even producing severe headaches, acting mainly on the posterior-passional part of the brain, as any one may satisfy themselves by the powerful sensation in the back part of the head, on deeply breathing over the bruised leaves. Agreeable as it is to our sense, few are found to bear the odor save at a distance. From the slightest collision, burnishing, or friction, these laurel leaves emit an extra amount of sweet, spicy odor; hence the name Spice Tree, and its use as a culinary substitute in early times.

The classic reader need scarcely be reminded of the renowned reputation of ancient *Laurentia* as a favorite resort of the feeble, and secure retreat from the pestilence, for there similar prophylactic laurels were the prevailing trees; besides, they have always been accredited with the quality of inspiring poetic ideas; hence the designation "Poet Laureat;" and for similar reasons it is, and forever will be, the immortal emblem and wreath for the brow of the brave, the gifted bard, and the perennial crown of the wise, for all the genuinely such are eminently in the affection of truths, and song is that affectional language of the soul.

This California Laurel is equally ornamental, if not far superior to the European Noble Laurel (*L. nobilis*). Of all the species ours is the most masterly imposing, very elegant and graceful evergreen tree. In briefly passing, let us lightly endeavor to see why, first, the foliage is not so tumuloid in separate outline, nor as a congeries of clouded masses, as in oaks and similar round-topped trees; nor is the top so prudishly exact to a line-pattern as are many of those. In these we have, with concurrent curves, a deeply thickened canopy, owing to numerous upright shoots in filling the

crown thick with accumulated leaves, because adherent for several years, and so set very far back on the twigs; but this formal strictness is adequately complemented and duly graced in the outer pendant boughs. Are you alone or with a congenial companion, you may hourly watch the wind waves gently rolling over its yielding foliage, shimmering the lights and softening the shadows, until you heartily realize, in the words of the poet,

"The glory that the wood receives
At sunset, in its brazen leaves."

Though magic wands were formerly made from branches of these trees, there is some reason still for believing that there are more magic spells now in watching them wave so gracefully to and fro from the boughs; nor must we forget their invisible influences altogether, such as sanitary, brain, and nerve support, magical, poetical, and musical—the noble inspiring base of wisdom and valor, with all its literary traditions, including the wreaths of the immortal Nine, with which they decked the brows of their favorites. In more recent times, the students who had taken their degrees at the universities are called Bachelors—from the French "*bachelier*," derived from the Latin *bacca laureus*, a laurel berry. As these students were not allowed to marry—lest the duties of husband and father interfere with their literary pursuits—hence, in time, all single men were called bachelors. "Speaking of rats," reminds us that the germinal end of the oblong nut of the fruit has, "for all the world," the perfect profile and markings of a rat's nose and mouth, and truly the old wood-rat himself is exceedingly fond of them.

Among the many uses already noted, the leaves of these salubrious bachelor trees have been used for making bay-water. In early mining annals, also, condiments—when the usual were not, or scarce and high—then, withal, he flavored his meat and spiced his food; indeed, this tree is allied to the cinnamon, camphor, and other spice trees of commerce. The wood is remarkably hard and takes the finest polish; has eminent qualities that commend it where great toughness and elasticity are the requisites, *e. g.* no powder-mill timber, save this, ever comes out of those wonted tremendous explosions safe and sound; in short, it is quite unpareleled on this coast. No native wood has been more highly esteemed for cabinet work, and for the finest ship and other joinery and general ornamental purposes; for, in brief, it is preferred, from first to last, like its congeners of old, whether it be scap-ter for king, mace for judge, the shepherd's crook, or the old man's staff. That it has been carelessly cut and hastily

worked, regardless of all antecedent customs and experiences of mankind, might be expected—the early Californian is probably not the only one known to career in a maelstrom of self-conceit or marvelous indifference to all the wisdom in the heavens above, earth beneath, and waters under the earth. Better be a little over scrupulous, as our fathers were, in the observance of times and seasons for cutting timber; waiving all cavil, in one universal voice it is agreed by common consent that timber, as a rule, should be cut in the dormant state of the sap, as the wood has then finished another greater ripened cycle, closed in and garnered the good—say from about the last of August and September, far into Fall, *i. e.* according to locality, whenever its closing growth season is, for then the timber is at its best. But if cut in its Spring or juvenile state, the timber is necessarily inferior, if not utterly worthless—for many reasons, but if for no other, because the *Pinus*, a little black beetle, bores and eats it up to a perfect powder-post within, with only an outer apple-of-Sodom shell left; great havoc is thus made of ceilings, bannisters, book-cases, and even books themselves, and indeed all kinds of furniture. Dr. Harkness informs me they swarm out, in Sacramento City, by myriads, on the fifteenth of May. In view of these facts, omissions, and commissions, alien to every axiom, ancient or modern, are we not justified in saying, that with this supreme indifference to the wisdom of mankind in all ages, it is fortunate no Delphic Temples are now built of bay, and dedicated to Apollo as of yore, or they would crumble to dust before the child then born were out of pantalets? Even heaven's own lightnings might be supposed to take some pity on such puerile and ephemeral proceedings, leaving it exempt and unscathed, as this timber has the reputation of being.

The Bay Tree, extending from Oregon throughout California into Mexico, of such wide and diversified range, must needs bear many local or common names, some of which are sufficiently complimentary and poetical, *e. g.* "Balm of Heaven," applicable to those mainly within sounding echoes from off the peaceful shores; farther back and far south on more burning exposures, reduced to a bush, the odor is too rank and disagreeable, might then well carry another name—the famous "Pepper Bush," etc.

BOX ELDER OR ASH-LEAVED MAPLE.

(Acer negundo.)

"Go mark in meditative mood where Autumn
Steals o'er his woods with mellowing touch like time—

"Tis a scene
That o'er us sheds the mild and musing calm of wisdom."

—Anon.

A HANDSOME rather round-topped tree, with great wealth of soft, velvety foliage, constituting one of the densest shades known to California. A tree forty to seventy-five feet high, rarely over two feet in diameter; trees sixty by two feet are found in the vicinity of San Francisco, at Tamalpais; in Carson Cañon, forty by one and one half; at Corta Madera, Olema Creek, forty to fifty feet, and of great beauty. The Autumn foliage does not color so uniformly as other maples. After the fall of the leaf the sunlight is let freely in through its open and widely expanding branches, which then seem scattered, and the twigs rather sparso and heavy; its magic changes and bold contrasts between these respective states, are as wonderful as the wild walnut. The compound three foliate leaves are large, and like the young twigs very velvety; the separate leaflets nearly broadly egg-shaped, and somewhat three to five lobed, a little unequally coarsely cut-toothed on the margins above the entire broadly wedge-formed base—the lateral ones on very short leaf-stems, often only lobed on one side—the terminal odd one with much longer leaf-stem; these, with abundant drooping maple-like clusters of fruit, so deeply in-fill the top as with a pliant massive mantle of velvet, that few trees can equal the quiet, elegant, and dignified expression of the California Box Elder. These qualities, so manifest to all, render it one of the choicest and most desirable shades for rural adornment and road-side adaptation as avenue trees; hence, we find it held in high esteem by the public wherever available; the timber is soft and white; sap yielding sugar, a tree requiring a soil of some considerable moisture. On the coast south, this tree abounds, and in a few instances may be larger. A noteworthy fact of the instinct of the great gregarious butterfly (*Danais archippus*) is, that oft as the autumn air is filled with their living clouds, migrating to the happy isles beyond the Pacific floods, when those cold and torpid nights come down on their festive flights, they must needs roost and rest, for they can no longer fly, then

myriads of them cling to the soft velvety leaves of the Ashen Maple for warmth, for solace, and for sleep. Is not their choice marvelous? And to behold them nightly return with the same regularity, for a time, as the pigeon or other wild birds. A jar, or club being thrown, they then fall helplessly down in showers of thousands, ere the sun revives them to active life again.

MISS DAVIS'S LEUCOTHOE HEATHER.

(*Leucothoe Davisii*.)

"Oh, happy pleasure! here to dwell
Beside thee in some heathy dell."

—*Wm. Wadsworth.*

A BEAUTIFUL evergreen shrub, three to six feet high, nearly smooth, leaves alternate bright green or only a shade lighter below, thick, oblong, obtuse at both ends, or only the uppermost acutish-pointed, margins minutely toothed, leaf-stem short, blade about two inches long; flowers on long, one-sided racemes, and these in little fascicles of two to five or more in number, a terminal cluster adorning the tips of the twigs with an abundance of delicate, white, tubular bells gracefully nodding, all in a row along their respective common flower stems, to which they are articulated by a short thread of their own, bracts and bract-eoles scale-like, etc., etc. Perhaps we may be deemed too particular, but this is seldom urged against a new discovery, much less one so desirable for cultivation. To the hypercritical and fastidious these flowers might be considered too coquettishly pursed at the mouth, and a little pouting; but they are fragrant and decidedly pretty. The honey from some flowers of an allied kind brings on intoxication of a formidable phrenic kind of very lengthened duration, and most of their relations have a heady tendency, to say the least; but little is as yet known of this species, and the fruit is altogether unknown.

Collected by Miss N. J. Davis, of Plumas County, found in the high Sierras, north.

PIPSISSEWA.

(Chimaphila.)

"Thy sports, thy wanders when a child,
Were over in the sylvan wild."—Bryant.

A LOW winter-green shrublet, with long creeping half-underground shoots, sending up-curving stems here and there a span to a foot high; the tufted leaves reverse-lanced, or the base wedge-form, margins sharply and slightly saw-toothed above, these whirls paired or somewhat scattered, very dark varnished-green above, and not at all spotted, light green beneath, the single naked flower-stem from the top supporting a cluster of fragrant flowers, white or blushing, consisting of five concave petals or floral leaves in a wheel-form; anthers, ten, yellow or purple, on woolly threads or filaments, arranged in a more or less umbeled order. A very pretty plant, but can only be cultivated in damp, shady, well sheltered, mossy, or leafy-mulched places. Highly valued as medicine; all parts used for tea in a great variety of complaints, as tonic, diuretic, etc., and also externally. Why it should be called Prince's, or anybody else's, Pine, requires no small amount of imagination to conjure this humble creeper into any remote similitude, unless it is found in the very dark green tufts of confused foliage, seen in the most general twilight perception of the inattentive rustic, or from a like ancient state that gave the name "grass" to mean everything green. A thousand lifelong associations throng around these ever-refreshing wood nymphs, numberless and ceaseless as the waves of the great Pacific Sea, that soothes to silence and to contemplation.

Found in hilly woodlands, for the most part, chiefly under the shade of coniferous trees, or mixed with oaks; Mendocino County, and north around to Mount Shasta region and Sierra Valley.

The *C. Menziesii*, also, is a charming foliage plant of variegated white mottled leaves, hence called the Spotted Winter-green; about a span high; leaves mostly broad, egg-shape, two, two and a half, or three inches long, about half as broad, often more or less purple beneath; most strikingly resembles the Eastern *C. maculata* and the recently discovered Japanese *C. Japonica*; fruit somewhat wheel-shaped, five-lobed and celled. Found in similar sweet forests, often together, as companions.

AMERICAN ASPEN.

(Populus tremuloides; correctly, tremuliformis.)

———"When zephyrs wake
The aspen's trembling leaves must shake."—Johnson.

THIS is usually a small tree of thirty to fifty feet, but in some of our alluvial bottoms and borders of lakes, abounding in groves, it rises to seventy-five or one hundred, always with a relatively small diameter of one to two feet in California; but in the Valley of the Mississippi River, trees four feet in diameter and two hundred feet high are known. This tree is always neat, and as a belle in her teens; the body slender, and apparently perfectly cylindrical; smooth and soft as if just bound in Russia leather, of whitish-clayey, or semi-sober pea-green bark; the branches also are slender and small; the bark on their upper surface becoming lighter colored, which reflects the light afar, and renders these trees conspicuous objects at a great distance, and more especially in their bright yellow Autumn dress. The young shoots are bright varnished, bronzy, brownish green, and the short twigs go off at broadened angles, which give ample space for the foliage, making the spray open and airy; the long buds sharp pointed, glossy, varnished with balsam; like all the poplars, leaves somewhat heart-circular in general outline; two inches or so long, and about equal in breadth; short, abruptly-pointed, slightly wavy-toothed and a little downy on the margin, supported on very slender, long leaf-stalks; latterly compressed, or thinly flattened at, and less so far back from the blade, contrariwise; and thus weakened, to any breadth-wise, horizontal impulse, they fluctuate and flutter, or rock as lightly and prettily as any wavelets with their breezy lights and shadows o'er the mirrored lake; to the beholder it seems a ceaseless wonder how these leaves can be so sensitively responsive to the most trivial zephyr, even when all else around is still, save their own cupiditative prattle to the passive ear; and to the eye; as ever, glinting the light of truth above the trembling shades; as sparkling wit is wont to "drive dull care away," with all her approaching gloomy shadows, yet can we not discern, alternating coyly, the humorous, the festive, and the foolish withal? Let not the sage nor serious, forever hearken to hear some portentous "going in the tops of the aspens;" nor are these emblem leaves of the literati and the poets altogether so frivolous as some of them suppose, and many

more apt to take for granted as manifestly apparent; for thus they earnestly renew their life, and do continually go to enliven the groves, and the hearts of all in sympathy with them, and their likeness. 'This ever restless, not to say unstable motion, is common to all the poplars, and some of the *populars*—with the birches—but in none is it so characteristic, as in this *tremuliformis*. We have not alluded to the tiny infantile, silky side stipules which fall off; but the flowers and fruit are more important. The male catkin-tassels are two inches or more long, with deep crimson stamens in clusters on notched scales fringed with hairs. The female fertile tassels are also very hairy, studded with crimson stigmas conspicuously prominent from their own prettily curved or pending tags, becoming elongated as they ripen, in May, to three or four inches.

The wood is soft light and white, fine grained, and sand-papers and burnishes well, but quickly perishes on exposure to weather. Is deficient in strength, especially in lateral strain, but is nevertheless applicable to many uses. Such woods that are so neat, never splinter, seldom season-crack, and though laterally weak, do not usually split with nails, etc., are apt to be too flippantly scandalized. It must be borne in mind, that the caprices of fashion, so often deprecated, still rule the world, and the novel demands of the arts, and constantly increasing inventions, may at any moment, in a thousand ways, cause these to spring into notoriety, and transiently outstrip the more durable in demand, as in quality. This vacillation of value may be as unreasonable as some of the fashionable people that have most use for the article, or the demand prove as fickle as the foliage, or those whom the masculine poets have wantonly likened thereunto. It is already reported to be ground into pulp for paper for casks and a thousand uses, and by the discovery of a cheap vitreous or lackered varnish, etc., our old current ideas of the value of these soft white and light woods in general, might entirely vanish away. The bitter bark is a valuable tonic, like quinine; but the balsamic spring buds as a tea, with a little borax the size of a pea, restores the enfeebled languid state and capricious appetites of Spring in a wonderful degree.

Found throughout California and the coast generally, abounds mostly at about six thousand feet to ten thousand, of Sierras and corresponding thermals.

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