

POINT LOBOS RESERVE

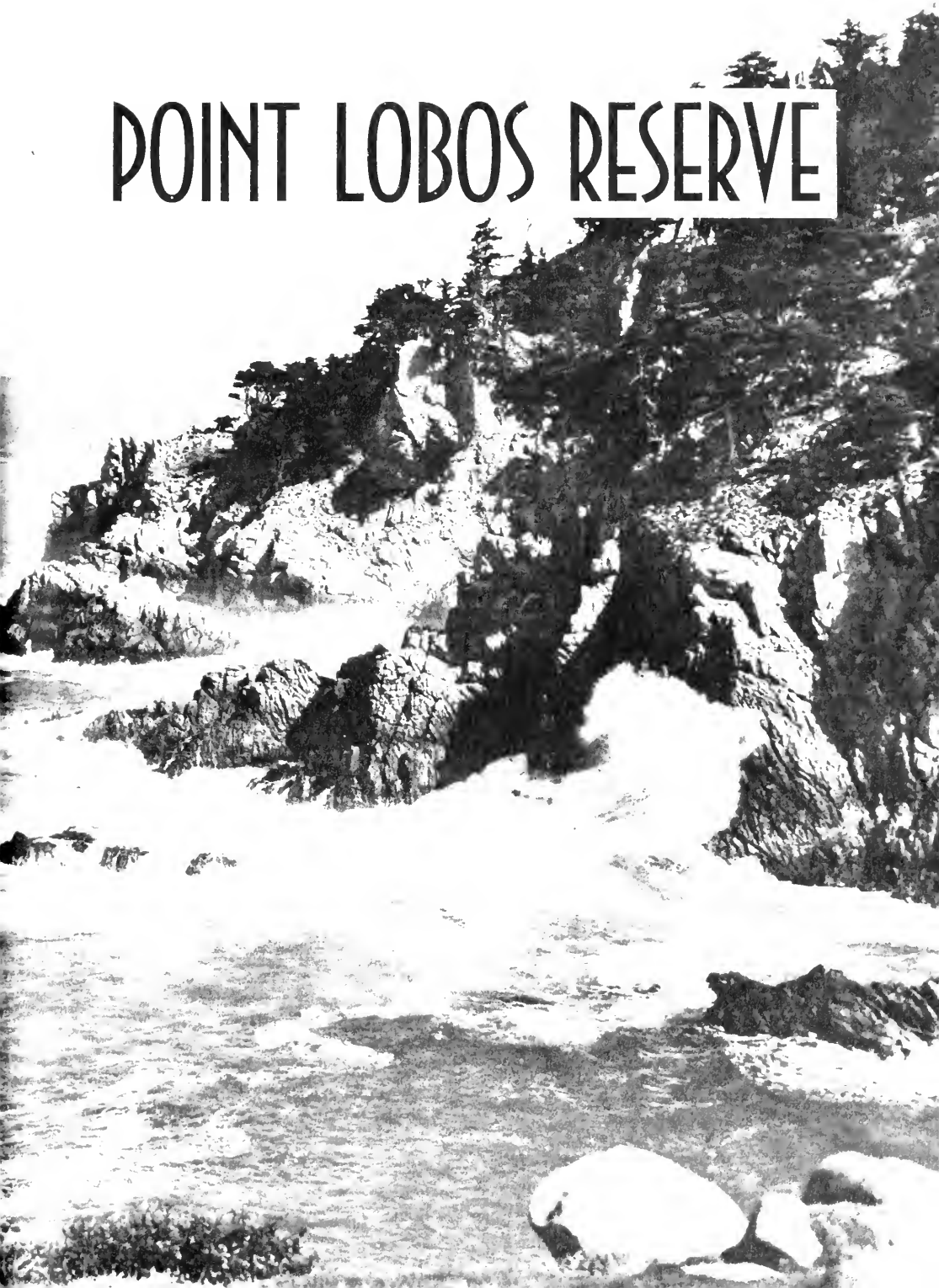
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POINT LOBOS RESERVE



The Cover—North Point From
Cypress Grove Trail

Photo by Gabriel Moulin

STATE OF CALIFORNIA
DIVISION OF BEACHES AND PARKS
Department of Natural Resources

POINT LOBOS RESERVE

STATE PARK, CALIFORNIA

*Interpretation of a
Primitive Landscape*

Edited by
AUBREY DRURY



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An eminent artist described
Point Lobos as "The greatest meeting of
land and water in the world" ►



FOREWORD

This book is intended to guide the reader to a fuller understanding of Point Lobos Reserve, its unique value as an example of primitive landscape, and the reasons for the policy underlying its administration.

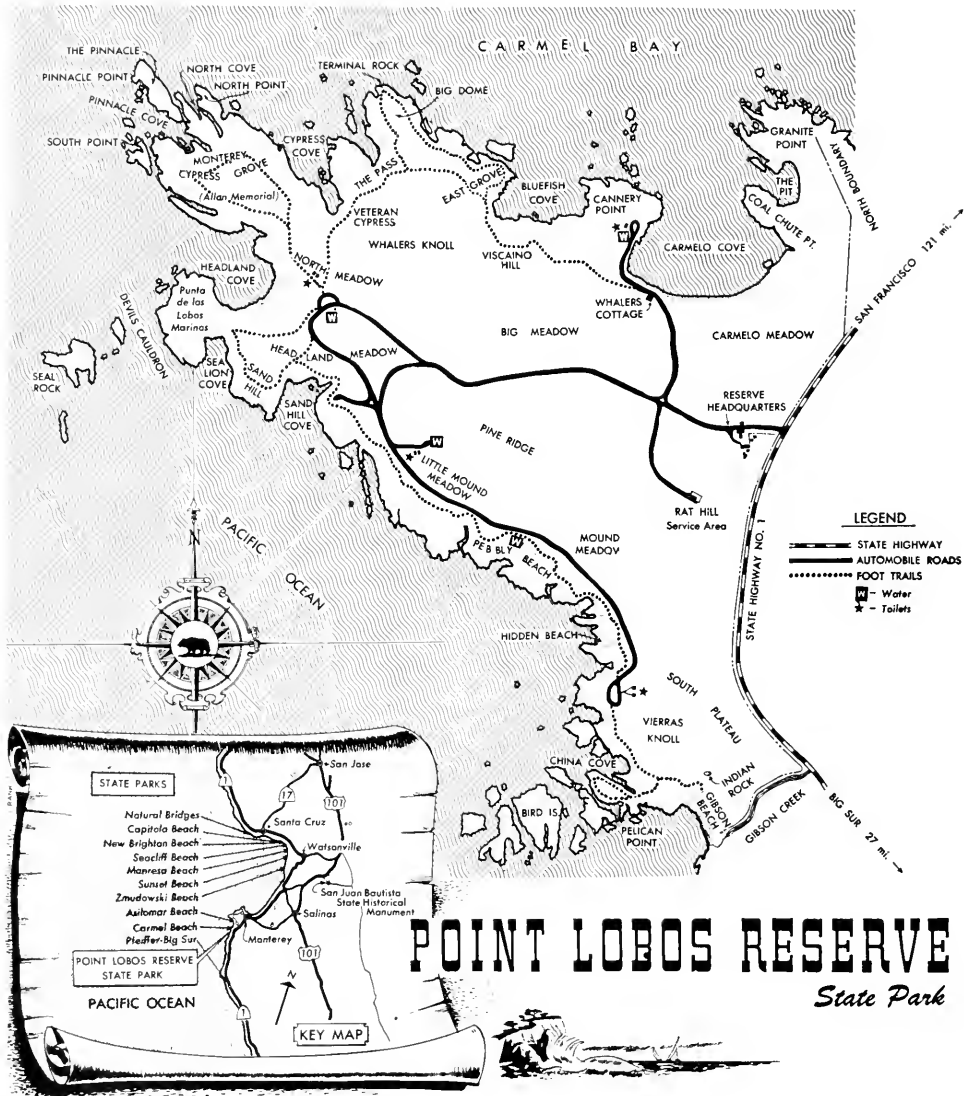
A rocky promontory on the shore of the Pacific three miles south of Carmel, California, crowned by a grove of picturesque wind-blown Monterey cypress, backed by slopes and meadows rich with associations of plant and animal life in relatively undisturbed environment, Point Lobos has long been recognized as an area of rare natural beauty and exceptional scientific interest. When it was acquired for the inspiration and enjoyment of the public, the California State Park Commission appreciated its perishable qualities, and asked an advisory committee, with assistance from the Carnegie Corporation, the Carnegie Institution of Washington, and the Save-the-Redwoods League, to undertake an intensive study of all values inherent in the site, and to recommend the plan upon which the present policy of protection is based. This publication has been made possible by a grant from the Carnegie Institution of Washington, D. C.

A composite work, this volume has been taken from the findings of specialists who contributed to the Point Lobos Master Plan, and the writings of others who have thought upon the problem of protecting primitive landscape conditions. At times these are quoted verbatim, and at other times their reports or recommendations are paraphrased. Credit is given at the beginning of each chapter to those from whose studies material has been drawn.

Just as Point Lobos Reserve is a living, growing thing, subject to never-ending change, so this book may doubtless in future editions undergo extensive modification both in content and method of approach—provided the belief is correct that there is continuing need for such a work in the field of nature interpretation.

AUBREY DRURY, 1954

August, 1954



Orientation, Boundary, and Facilities Map—Pt. Lobos Reserve State Park

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CHAPTER I

PROTECTION OF THE PRIMITIVE *

When the program for preservation of Point Lobos was being outlined, the reasons given for protection of the area were found mainly in the occurrence of the last original or primitive stand of an interesting and beautiful tree, the Monterey cypress. While the Point has many exceptional features, it is doubtful whether the supreme effort to protect it would have been possible without the need for preservation of a unique treasure such as the cypress. Other features, as illustrated by the exceptional setting for the cypress grove on a rocky promontory almost surrounded by the sea, enhance tremendously the beauty of the place. These additional factors, taken with the unusual esthetic value of the cypress, give the locality a peculiar charm, and there can be no doubt as to the importance of the association and interrelation of these numerous features.

In a discussion of the values of Point Lobos a great number of features must be considered, and it will be necessary also to examine these elements both collectively and as separate units. But it is important to remember that if the cypress were lost we would have failed in the first purpose of this endeavor. At the same time it is necessary to bear in mind the fact that an attempt to maintain the cypress in a primitive condition probably requires maintenance of the cypress in its original environment with all of the included factors. To risk the loss of any element in the setting might jeopardize the whole group, including the cypress. Particularly important is it to maintain the entire group of elements, because such protection not only continues the great scientific values represented but may at the same time be one of the most important guarantees of continuity in the esthetic qualities and the human appeal of the region.

In viewing the problem of Point Lobos and the Monterey cypress it is well to consider the situation in the light of available information from the vast accumulation of facts relating to the history of life. In the almost infinitely long period during which life existed on the earth before the appearance of man, a vast number of species of plants and animals became extinct through the influence of natural processes. The history of the Monterey cypress suggests that this tree may, in the geological sense, be on the verge of extinction. If it be true that this species is about to disappear under the influence of natural processes, intensive scientific study might show the manner in which we could rescue this element of beauty and of scientific interest by modifying or eliminating some factors inimical to the life of the tree. Viewing the situation from another angle, it may be that we should look upon maintenance of the present natural factors and their natural balance as necessary for maintenance of the cypress as a part of the interrelated group of natural elements.

The Point Lobos project, and the master plan formulated for the California State Park Commission by the Point Lobos Advisory Committee and the associated group of specialists, of course involved attempts to secure

* By Dr. John C. Merriam, when President Emeritus, Carnegie Institution of Washington, D. C.; President, Save-the-Redwoods League, 1940.

information as to all of the natural features at Point Lobos which have human interest or appeal. An exceptional aspect of this program was the effort to bring together data obtained by specialists in all fields of knowledge represented at Point Lobos. The information from these varied subjects was then brought together in such a way as to relate the items concerning each portion or feature of the area, to elements in other fields of knowledge which may relate to some portions of the area or to comparable things represented in the complex of Point Lobos. Plotting each factor from the point of view of art, esthetic appreciation, zoology, botany, ecology, geology, paleontology, archeology, and early human history, consideration was then given to the extent to which these factors or features conflicted, or the extent to which they could be fitted together in a mosaic program made more valuable or more beautiful because of this interlocking of different elements.

While a program of this nature does not seem to have been worked out before specifically for any area with these ideas in mind, the general point of view of nature as a mosaic of many elements has been considered by writers in various fields. Particularly should one remember some reference to this situation in Heine's, "Die Harzreise."

In development of those features which have to do with accessibility to human beings and with administration it was also necessary, at Point Lobos, to determine the influence that development for purposes of accessibility may have upon future value of the region.

It is extremely interesting to note the way in which landscape architects have given consideration to elements in the picture of Point Lobos which have human interest or value in the field of esthetic appreciation or nature appreciation. This is the approach which landscape men should take in consideration of a primitive area, which is to ask, first of all, what are the elements which have human value? These will perhaps rest upon other elements than those involved in landscape study. They may be features which have come to be known through study of the geology or the history that one knows will have esthetic value comparable to design or pattern so commonly used as a basis of judgment by the landscape architect.

It is to be noted that study of the Point Lobos problem has been approached by the method which is natural, normal, and necessary, namely determining first what the values are in the area and then making a decision as to how the area should be made accessible and how it may be used. From this study, educational movements will develop which will make clear to visitors the elements that have been discovered through an intensive appraisal of the values of the region.

CHAPTER II

A MASTER PLAN FOR THE FUTURE *

“The greatest meeting of land and water in the world.”

Extravagant praise for any one portion of the earth's surface; yet these are the words of a noted student of landscape, the painter Francis McComas. And there are many who agree that on Point Lobos there have been brought to a distinguished climax many elements that make for landscape beauty and significance.

Deriving its name from the colonies of sea lions whose hoarse barkings are carried inland from the offshore rocks, *Punta de los Lobos Marinos* (point of the “sea wolves” to the early Spaniards) has scientific interest because the habitats of two species of sea lion—California and Steller—here overlap; because it holds the farthest-north breeding place of the California Brown pelican; because many forms of land and marine life remain here undisturbed, in remarkable relationship to their environment and to each other. But the outstanding distinction of the Point—and the element which produces most of its unique atmosphere—unquestionably lies in the presence here, associated with other diverse plant life, of the most outstanding natural grove of *Cupressus macrocarpa*, the Monterey cypress, widely distributed in earlier geological time, but now in its native state making a last stand in the Monterey region. Clinging precariously to the cliffs above the surf, shaped into picturesque forms by wind and weather, shrouded sometimes in the smoke of drifting fog, the living trees rich green in foliage, the dead ones standing stark in silhouette, their bleached white twisted branches red with algae, these cypresses are the characteristic note in a landscape beloved of artists for its form and color, and the dramatic story revealed by its oceanward pinnacles—the never-ending conflict between sea and land.

It was the recognition of such distinction that inspired the State of California, after long negotiations and at considerable cost, to acquire Point Lobos in order to preserve it as part of the Nation's heritage of beauty.

Escaping almost miraculously from the destruction of native landscape values that had occurred around it, passing from owner to owner who regarded it lightly—once in the free-and-easy early days of the Mexican regime, tradition says, lost as the stake in a game of cards—site of a whaling station, shipment point for a coal mine, laid out on paper as a townsite with its harsh gridiron of streets, grazed over by cattle, in parts occasionally burned—this rare and exceptional landscape was finally possessed by an owner who appreciated its full value; and, when it passed into the trusteeship of the State of California, fortunately held most of the essentially primitive character that had lured increasing thousands to it.

Yet when the State acquired Point Lobos, apprehension as to its future still remained. Residents of Carmel, quaint and leisurely village which had

* By Newton B. Drury, Chief, Division of Beaches and Parks, State of California; Director, National Park Service, from 1940 to 1951; for many years active as Secretary of the Save-the-Redwoods League and Point Lobos Advisory Committee; Research Associate in Protection of Primitive Landscape, Carnegie Institution of Washington, D. C.

long been a refuge for votaries of the arts, held up their hands in horror at the prospect of a *state park*. They visioned formal paths and artificial masonry, networks of roads and the frantic rush of automobile traffic, the din of crowds, the nondescript structures of catch-penny concessions and tourist camps, all, they feared, to the loss of more precious, but more fragile things—the spell, the mystery, the beauty of this site.

The Carmelites sighed with relief, therefore, and so did nature lovers throughout the Nation, when the State Park Commission set its face against these possibilities, pledging for all time that Point Lobos would be a “reserve”—a property held in trust as nature had designed it. For the commission concluded that it was in the public interest to hold this land unmodified, even at the cost of considerable restriction of use, as thus only could its highest values to the public be perpetuated.

Even so, the declaration of such a policy was not enough. What were the values? How could they be protected for people of many generations to enjoy? To find an answer to these questions was the complex problem confronting the commission.

Gladly, therefore, they availed themselves of the offer of the Save-the-Redwoods League, with financial assistance from the Carnegie Corporation and the Carnegie Institution of Washington, to make a thorough study, to formulate a policy, and to recommend a plan. An advisory committee of scientists, artists and conservationists was formed, with Dr. Ray Lyman Wilbur of Stanford University as its chairman. Specialists in many fields were engaged to make sustained observations, and to prepare an inventory, as it were, of all values possessed by Point Lobos, both material and intangible. Frequent conferences were held on the ground by the committee and its advisers, to determine the interrelation and proper evaluation of all the findings. It was not enough to map the topography, to analyze the geological structures, to plot the vegetative cover, to chronicle the 300 species of plants, 178 species of vertebrate animals, 88 species of marine invertebrates along the shore and in the tidal pools, the many species of seaweed and marine algae. The normal balance of conditions favorable to the persistence of each plant and animal species had to be studied. More, the relation of this balance to human use of the area had to be gauged.

It would be easy to become prosy in recounting the findings of the specialists in geology, zoology, botany, forestry, ecology, plant pathology—even archeology, and early history—each of whom contributed significant facts; the plotting and analysis of esthetic effects involved in the pattern and composition of the landscape; the study of forces, whether natural or artificial, which might tend to lessen or destroy the qualities that all these interrelated factors produced.

It took two years to prepare an 850-page typewritten volume embodying these reports and studies, and then to Frederick Law Olmsted, well-known landscape architect, and his coworker, George B. Vaughan, fell the task of correlating the findings in making a plan, the object of which was, with the

The State Park Commission pledged for all
time that Point Lobos would be a “Reserve”—a property
held in trust as nature designed it ►





minimum of disturbance of natural conditions, to afford those visiting Point Lobos the maximum enjoyment of its most worthwhile values.

The Park Commission and the Advisory Committee had before them ample warnings. They had observed the fate of other celebrated landscapes, whose fame and popularity had carried the seeds of their destruction. In their own-state parks—in the Coast Redwoods of Humboldt County, where steadily the roadside had been conventionalized and cheapened, as increasing pressure of tourist traffic had induced “improvement” of the Redwood Highway; at the Big Basin Redwoods of Santa Cruz County, the central grove of which a generation ago was rich in all the attributes of the primitive, the forest floor carpeted with ferns and flowering plants; but which today, frequented by milling throngs, cluttered with structures strangely out of place among the stately redwoods, presents an aspect bare as the ground beneath a circus tent. In the California Sierra, where one after another the last fastnesses were being penetrated by automobile roads, destruction following in their wake. Even in Yosemite, still incomparable, they witnessed the steady and inexorable operation of the law of diminishing returns, the disappearance when sought by many, of qualities which in the past had given Yosemite its fame. The dictum of Robert Burns, that

. . . “pleasures are like poppies spread,
You seize the flower, the bloom is sped,”

surely states the situation of some of the areas of greatest natural beauty in California.

What to do—or not to do—in a democracy, in order to perpetuate for the public of today and tomorrow, in undiminished freshness, the perishable qualities of its own property?

That was the delicate problem to which the members of the Point Lobos Advisory Committee addressed themselves. Observing trends elsewhere in the same field, they determined to escape if possible some pitfalls into which others had fallen, to avoid some fetishes that had been set up in the administering of public lands; to resist the pressure of *scenic showmanship* which measures success in revenue or attendance; of *recreational enthusiasm*, which considers that piece of level land wasted which is not teeming with citizens engaged in healthful and innocent outdoor sports, regardless of their appropriateness to the site; of *virtuosity*, the aim of which is to “paint the lily” or remake nature’s design in keeping with the preconceived notions of well-meaning individuals or groups, for the glory of themselves and their techniques—or merely to satisfy an itch to monkey with a landscape; of *made-work projects*, exulting in new-found resources, more designed for expenditure of money than expenditure of thought; of that *pseudo-democracy complex* which holds that if a piece of property belongs to the public, they have an inalienable and limitless right to use it, even if they use it up.

Extreme as some of these things sound, they all represent tendencies that have lessened the real value of public properties grouped loosely under

◀ The rocky points mark the seaward margins of the cypress groves. Inland, the Monterey pines form a solid covering

the term of "parks." This has not occurred through any lack of efficiency in operation on the part of those in charge. It has been largely due to the absence of a clear-cut realization of policy and purpose of administering natural areas.

To remedy such a situation the California State Park Commission adopted the Point Lobos Master Plan.

"To keep at a high level of perfection the unique natural conditions upon which the greatest values of Point Lobos depend, in order to make these permanently available for the enjoyment, education and inspiration of the public."

Thus was the purpose stated, and thus was the policy determined, both for development and use. Its guiding principle was moderation. Existing conditions were to be changed as little as possible, and these only in the interest of restoring naturalness or checking destructive tendencies. Automobile roads, for instance, were reduced from 16,000 to 8,000 feet, and their scars removed, without lessening their main function of carrying visitors within reasonable distance of important points. Parking places were located after careful study.

The finer areas are to be entered only on foot, over unobtrusive trails which follow the logical course of travel and lead to features of greatest beauty and interest, as determined by the analysis of the property. Entrance is free, except that the commission has retained as a protective measure a facility charge of 35 cents per car, which has the threefold merit of providing some revenue for administration, of being nominal for those who are genuinely interested, and giving enhanced appreciation of an experience through having paid for it. Marauders of the landscape, it is found, do not so readily mobilize on foot.

Camping and gatherings of the convention type, because of their destructive effects, cannot be permitted, but picnicking is provided for in least perishable portions of the Reserve, such as the ocean shore and beaches. Rules against destruction of plant and animal life are explained and interpreted by the staff, as well as enforced. Protection from an extreme hazard has required that there be no fires or smoking. "Clean up" for fire protection or other purposes has been practiced with restraint. The scientists have discovered important functions of the brush and grasslands as the habitat for small mammals and many species of birds. Structures and all artificial intrusions have been kept to the minimum necessary for administration, and so placed that they will not mar any important element in the picture.

As to protection, one emergency has already been revealed by the studies of plant pathologists. It is the threat of the cypress canker, deadly foe of the Monterey cypress, which if it takes hold at Point Lobos will destroy the most distinctive feature. Discovery of this plant disease within two miles of the Reserve led to definite and aggressive measures. Trained crews furnished by the National Park Service C. C. C. combed the territory for at least 10 miles around to detect and remove from all plantations of Monterey cypress those diseased trees from which the spores might be transmitted by wind or birds, and a protective zone was established wherein systematic examination and eradication were carried on.

Already in many parts of California the planted cypresses, so important in our landscape, are believed to be doomed, so far had this disease advanced before its menace was realized. There is no discovered cure. It may

be that in its type of locality the Monterey cypress will make its last stand, saved only in Point Lobos Reserve from total extinction.

All this, and much more, in the way of protective procedure is being interpreted and explained to the visiting public, and embodied in a basic publication. Artists, writers, students of flora and fauna, are encouraged to make this their headquarters, so that steadily at Point Lobos there may grow a tradition favorable to the established objectives. As to results from the Point Lobos program, California park authorities are optimistic and encouraged. Success thus far has been assured by the complete understanding and sympathy of the state park administrators. Their plans have been carried out ably by Park Supervisor R. A. Wilson. Scientists and others who contributed to the plan, upon revisiting the area, are impressed by the progress thus far in maintaining and restoring natural conditions. Displays of spring wildflowers in the undisturbed meadows and on grassy slopes were never more colorful. Marine life in the tidal pools along the coast remains in undiminished interest. The pine woods inland are a refuge for the many creatures whose presence gives meaning to the total spectacle. That "mosaic of many elements" spoken of by Dr. John C. Merriam as representing important human values in a concept of nature and the primitive, is being held intact, we hope, for countless generations to enjoy.

Certain it is that the Point Lobos program has significance, not only in determining the future trend here, but in setting the pattern for the administration of other possessions in the California system of more than 135 state parks, built up within the past 25 years to safeguard outstanding natural features not already included in national parks and forests. Notable among these are three mountain areas in southern California possessing Sierran qualities, namely Mt. San Jacinto, Palomar and Cuyamaca. Anza Desert, whose 460,000 acres contain a wealth of desert flora, includes such unusual and interesting plants as the native fan palm (*Washingtonia filifera*), ocotillo, smoke tree, cacti and the rare elephant tree (*Bursera microphylla*). Also preserved are the Calaveras Groves of Big Trees, Burney Falls and Castle Crags; and above all, the matchless forests of Coast redwoods, (*Sequoia sempervirens*), in Humboldt and Del Norte Counties—the Bull Creek watershed with its majestic "cathedral-like" groves in the flats, the primeval forest on Prairie Creek and along the Del Norte Coast; and the redwoods on Smith River and Mill Creek north and east of Crescent City.

Not all of California's state parks are destined to be "reserves." Some have historic meaning, primarily; some, of their very nature, will be devoted to outdoor recreation—such as the ocean beaches of the south. But for the more perishable areas, the program at Point Lobos has pointed the way to sound procedure, based on knowledge and appreciation. This lesson has been learned: to protect the primitive properly takes time and thought.



CHAPTER III

A LANDSCAPE OF BEAUTY AND MEANING *

When the seas are running high, as they so often do at Point Lobos, the huge waves, with their heaving, burst and drag, grip the attention and rouse the emotions. This spectacular impact upon shore forms of extraordinary variety stirs the mind to some appreciation of the vast power and dramatic quality of the forces here at work.

But on every hand, and in every kind of weather, other phases of the same great drama become apparent, more and more impressive as one's understanding grows.

The functional adaptation of a richly varied vegetation, marine and littoral, is directly traceable to the impact of waves and currents, of ocean winds, and windborne spray and spume and fog—from the lithe seaweed up through the tapestries of rock plants to the gnarled cypresses and the wind-moulded pines.

The cypresses tell a poignant story of survival in a battle against great odds, twisting and buttressing themselves against the thrust of wind and pull of gravity, extracting vigor from the driving sea fogs and adapting themselves to drenching sprays of salt that sometimes crust the soil with white and rout the advance of other trees.

Whole communities of living things are shaped in every vital detail to play their strenuous parts in the everlasting drama of the sea and shore—visibly so shaped, not only in response to these pervasive forces of sea and wind but also in response to conditions of soil and rock which are themselves the outcome of the same unending reaction of sea and land.

Rocks now crumble visibly before the eyes, grain after grain; rocks plainly formed in long-past ages out of pebbles on beaches, not unlike the present, then buried deep until a new uplifting of the continent enabled the sea to cut those other less ancient beaches which we see on the present hillsides, terrace below terrace—until finally the ocean again reached and hammered into the same old beach conglomerate, rattling its veteran pebbles back and forth, and with them battering out new clefts, chasms and caves where planes of weakness had been formed by continental heavings.

Infinite are the variations of meaning relating to this single dominant theme, immensely inspiring in their significance, and expressed in forms of exceptional sensual beauty.

One sensitive to beauty and meaning in landscape, and disposed to analyze its appeal in terms of pattern, form and color, finds in Point Lobos Reserve and surrounding country a great variety of types. An attempt to classify them would reveal as worthy of specialized appreciation such types as: (a) the seaward margins of the cypress grove; (b) the cypress forest interiors; (c) glades and meadows on the cypress forest landward margins; (d) Big Dome cliffs; (e) open points jutting into the sea; (f) the littoral areas and sea caves; (g) open saddles; (h) open hilltops; (i) high

* By Frederick Law Olmsted and George B. Vaughan.

◀ When the seas run high at Point Lobos, the onlooker is gripped by the power and dramatic quality of the forces at work



chaparral areas; (j) broad, sweeping meadows bounded by varying combinations of pine forest, chaparral and the sea; (k) pine forest interiors.

It should be admitted that no satisfactory explanation can be given for any esthetic experience, so far as the landscape is concerned. It should also be recognized that the appeal of Point Lobos is to many senses, and is composite in its nature. To each beholder some one phase or feature has a special meaning. Nevertheless, it may be of some value to attempt a study of some elements that contribute to the character and charm of the different landscape types in this area.

Seaward Margins of the Cypress Grove

The most dramatic landscape effect—in fact the supreme effect of the entire Reserve—is found on the outer ends of the cypress-covered points, and principally of Cypress Headland. Here, as on a mountaintop, one has the sense of being on a battleground of natural forces where man is a negligible factor. Here, where the cypress clings to the very edge of the continent, one feels the power of the elements in rolling surf churning against jagged rocks; in the outlines of these rock formations sloping upward and away from the sea; in this same slope repeated by the surfaces of wind-sheared cypress foliage, and carried back to the crest of the forest, beyond which there is comparative shelter. If, when the wind blows, there be driving fog to trace its course, this effect is intensified; for the fog drifts up along these same lines, flowing over the sloping rocks and smoothed foliage, and through the bleached and naked limbs of any tree that has dared to raise itself above this general slope. The tree trunks leaning from the wind, foliage clinging in dense masses on the sheltered side of branches, buttress formations to the lee supporting trunks and limbs, and anchor roots to the windward holding fast in crevasses of the granite, even on quiet days, tell a story of frequent high winds and flying spume.

The feeling of seclusion, of being far removed from the influence of man, is an important part of the spell that is cast about this place. Little is here to remind one of human attempts to modify the work of nature. Trees carry dead branches, and skeletons of trees whose life cycle is completed stand stark or lie prostrate, undisturbed. The only trails are casual tracks, such as animals might have made. Here is the inner sanctuary which has been reached by progressively leaving the evidences of civilization behind; first, by turning aside from the main stream of traffic at the highway gate; next, leaving the supervisor's house behind; then abandoning the automobile at entrance to the headland, and finally coming on foot through the cypress forest with one's face toward the ocean and the end of land.

Where the oceanward pinnacles burst upon the view is felt most strongly that stress and flow of elements resulting from repetition of form; the slope of rocks repeated again and again, and re-echoed in wind-blown trees and movements of fog; and if one stands on the open end of Cypress Headland—on North Point looking south, or on South Point looking north—this repetition is increased by the view of three or four rocky points, each in succession presenting a variation of the same theme.

Another interesting repetition of form conspicuous throughout all the granitic portions of the Reserve and adjoining coast, is due to various angles

◀ The twisted and gnarled cypresses tell a poignant story of survival in a battle against wind and fog, and drenching salt sprays

and directions of faulting of the granite which produce a series of steep slopes facing northeasterly and southwesterly; and where a point is being cut off from the mainland by the sea there is also a steep slope to the southeast. Thus the form toward which each point and island is tending as the ocean carves away its base is that of a pyramid. This is typified by the pinnacles at the outer end of Cypress Headland.

Combined with this strong harmony of form is remarkable richness of color. The sea is the most changeable element, reflecting from afar every color of light thrown upon it; rich blue under a sunny sky, shot with white or lead gray from banks of fog, or tinged by brilliant reds and yellows of a sunset. Close inshore the plunging view from bluffs and cliffs, so characteristic of Point Lobos, penetrates the surface reflections and catches light reflected from things beneath: brilliant emerald greens of sunlit sand, warm red-browns of waving kelp, lavenders and crimsons of life encrusted on the rocks, rich olive greens of deep water and pale blue-greens of submerged clouds of air close to the foaming white breakers—with, perhaps, as an added touch of color, a black and white guillemot with orange-red feet swimming around the shore. These are impressions one remembers, and when overlaid with swirls of creamy froth and broken here and there by reflected glints of gray rocks, overhanging green foliage, bright orange alga or blue sky, the riotous symphony of changing color becomes a challenge to every artist to see how much of it he can catch. Then add to these the red-browns of the granite below the spray line; and, above, the blue and pink trailing rosettes of *Cotoledons* with their pale yellow flowers making a soft rich tapestry over the steep bluffs; and, above these, a zone of green covered with fiery orange *Castilleia*, bright yellow *Ericameria* and soft blue *Erigeron* going back into the shade of the cypress woods where rise the tree trunks, red-brown, or bleached to the light gray of the granite rock; naked and dead, or supporting at their tops dense heads of twiggage washed beneath with the rich orange-red and silver of the alga; and crowned against the sky with bright green foliage. This is rich pictorial material, and even painters who care little for the manifestations of nature come here day after day, and year after year, for inspiration.

For those who find greatest interest in observing nature as a dynamic living organism, there is added to the thrill of color and form a dramatization of two opposed processes—one, the disintegration of the rock by the plant cover and rain and sun, making of it food for the support of a richer and finer plant cover; and the other, that of the sea eating slowly back into this headland, aided, strangely enough, by the cypress tree itself, which may be observed splitting off great chunks of granite by the pressure of growing roots in seams of the rock. It is thrilling to go out onto the Cypress Headland and stand in a wilderness of clean-washed granite ridges with sea water surging in narrow chasms between, among rocky ribs of the earth that once supported soil, flowers and trees like those seen inshore.

The cycle of growth and decay of the cypress is worth noting because of its influence on the character of this landscape. Where reproduction is very thin and scattered, as on the outlying ridges at the end of Cypress Headland, and in portions of the landward margins, trees stand out as individuals through their entire history. Elsewhere, reproduction is apt to go in waves, creating thickets of young cypresses whose foliage often presents continuous surfaces modeled by the wind into smooth-flowing contours. The most outstanding examples of this effect are to be found in the eastern portion of the north shore. A less extensive example is to be found

at the head of the southern cove on the end of Cypress Headland. As such a group matures, losing its lower limbs, it approaches the condition of the much painted and photographed group of twisted and distorted trees on the outer south side of Cypress Headland which is of added significance when one realizes that this represents a late stage in the life of this group. Where reproduction has been adequate to insure the continuance of such groups, the young trees growing up have obscured the old picturesque trees.

Another of the outstanding cypress forms is found also on the seaward margins, but on more sheltered portions of the shore, splendidly typified by the so-called *Old Veteran* at the head of the cove west of Little Dome. Old, flat-topped trees of this type have matured without much distortion from wind, standing mostly alone at the seaward edge of open meadows where they form striking silhouettes against the sea beyond. On the south shore of Cypress Headland, such trees compose magnificent pictures with the foreground meadow and the farther side of Point Cove and the Seal Rocks behind.

Cypress Forest Interiors

Of this phase there are at least two classifications: (1) Dense thickets of young trees, usually with many dead twigs and of little esthetic value as seen from within—they have important meaning, however, as they are one link in the development cycle of the cypress—; (2) heavy mature woods containing large trees. Such have considerable dignity if not too much cluttered up with small, young growth, although some inmixing of young trees gives interest and contrast. Since these groves are limited in extent, it is always possible to get glimpses of the bright sea out between the trunks, that frame many fine “window vistas.” Thus, while within these groves one feels sheltered from the sea-winds and bright light, the eye is drawn toward the sea margins, making them less restful and sufficient in themselves than the depth of the pine forest. The principal interests here are the great variety of fine tree shapes and the vistas seen through them. Notable groups of large specimens are scattered through the cypress areas, each with a character of its own. In several places the character and interest in the cypress woods lie in the trailing “moss” hanging pale green from every branch and twig, usually lighted from beyond through the filmy shreds. This adds to the atmosphere of “untouched wilderness.”

Glades and Meadows of the Cypress Forest Landward Margins

Open margins of the cypress forest, away from the sea and sheltered spaces or glades within the woods, whatever their cause, are very important to the total esthetic make-up of the cypress areas. Views across these openings reveal the luxuriant green walls of cypress foliage, and vistas of the sea, and surf-battered rocks crowned with wind-dwarfed trees. Here we have the contrast of two phases of cypress growth. It is difficult to associate the battered cypresses of the outer rocks with the same trees thriving richly on the edges of sheltered inland swales. Such amazingly different forms are assumed under different conditions.

The distributional pattern of the cypress grove, typically a crescent with its thick middle portion on the outer end of a granitic point and the two tapering points trailing back toward the heads of coves on either side, follows largely the pattern of fog penetration when being “burned off” by the sun over the heated land, and also the pattern which one would expect a given density of salt from the breakers to penetrate under similar



conditions of sea-winds—and thus to the beauty of the scene is added the interest of speculation as to what are the determining factors which have so reduced the once-extensive cypress forests to their present slight hold on the two granitic points that they occupy.

Big Dome Cliffs

The north side of Big Dome and adjacent shore, while bearing cypress, are quite different in feeling from the other cypress shores, because of the dramatic cliffs rising almost sheer from the water 75 feet to the narrow ledge where the trail is—and then up again in bare faces of beautiful lichen-covered granite, with only narrow footholds here and there for trees, to the narrow summit, 260 feet above sea-level. Here the cypress, while confined to the shelves where soil can lodge, has propagated continuously so that in any location the trees range from magnificent, tall, straight-shafted giants to graceful, pointed seedlings which one might step over. Here, instead of finding the trees distorted and dwarfed from battling with the salt-laden wind, we find them high up above the sea thriving against the background of colorful rocks which shelter them from both sun and wind. Because of the northern exposure, these rocks are always a show of color from herbaceous material. Here, too, are a few adventurous pines that have seeded into a habitat where they can never thrive, and it may be felt that esthetically these sickly trees weaken the otherwise admirable effect created by the other plants which so well adapt themselves to these cool, rocky shelves. Ecologically these pines are interesting, but they can hardly be called inspiring. From the trail that zig-zags up from the end of the shore trail to the summit of Big Dome are obtained lovely views of Cypress Headland and Bluefish Cove, and of Carmel Bay framed by the cypress trees clinging to the knoll.

Open Points Jutting Into the Sea

There are three such points of outstanding quality: Pelican Point, Punta de los Lobos Marinos and Granite Point. From the former two, the central objects of interest are nesting birds and the sea lions. From Pelican Point, the effects are comparatively simple: the bare, knobby islands with the wash of the sea about their feet, and several species of birds nesting, roosting, bathing and drying, and always birds departing and birds arriving making everchanging patterns in the sky. Morning is a time for zoological study. Evening is a time of silhouettes.

From Punta de los Lobos Marinos the interest is more varied and the scene more changing. The great sea lions keep calling attention to themselves with their yelping and growling as they spar on the rocks or sport in the breakers. Here, during a high surf, the great seas, crashing over the rocks and charging down on the outer end of the Point, leap high into the air and fall back again in a drenching rain. Here, on a quiet day and at a low tide, one may see tide pools as lovely as any garden with many living things. And here at close intervals, all day long, sea birds pass, flying north or south between the Point and the Seal Rocks, so that one might well sit for long hours watching the movement of the sea and the life associated with it.

- ◀ Open, rocky points that jut into the sea provide a habitat for nesting birds and resting sea lions

In the northeast corner of the Reserve, Granite Point presents quite a different appeal. All through the spring much of the area is covered with the most colorful wildflower display to be found in the Reserve, both of the rocky meadow types and of the north-facing sea-bluffs. Over these, as a foreground, one gets raking views of the whole north shore with its picturesque knobs and bumps, its outlying islands and its cypresses and pines. To the east, against a background of curving beaches, hills and valleys, is the string of rocky reefs close by across Moss Cove, where one may see as fine a surf as any to be found in the Reserve. One may also be impressed by the fact that the topography of this point, the orientation, and the plant list, are surprisingly like that of Cypress Headland.

Littoral Area

The principal esthetic value of the littoral, or tidal area, is not usually to be found in the broader outlooks but in the interest of details close at hand.

Of interesting tidal pools containing garden-like growths of plant and animal life, there are quite a number. Notable ones are situated (1) east of Big Dome; (2) on the north side of Cypress Headland; (3) on Punta de los Lobos Marinos, perhaps the most accessible and beautiful; (4) scattered along the south shore from Sand Hill Cove to Pebbly Beach, a series of interesting pools.

Of small sea caves there are a number, seven or eight of them, accessible to bold climbers during times of very low tide and calm sea. These are to be found mostly in Sand Hill Cove and 1,000 to 1,500 feet southwesterly. Some of these show very beautiful incrustations of lavender and scarlet growths, and most of them give interesting geologic exhibits in clean-ground conglomerate surfaces, often revealing faults that have cracked and slipped the porphyritic pebbles. Of tunnels, double-ended caves, always dramatic evidence of the work of the sea in detaching islands, there are some 15 in the Reserve. A very interesting one is in East Grove, with a great cypress tree growing on its bridge. The others are mostly grouped near Pelican Point.

Some of the small beaches of the Reserve are tucked away between cliffs, and one happens upon them in surprise. This is true of Sandy Beach, and particularly of Hidden Beach and China Beach. The latter is the safest and most sheltered place for swimming. Moss Beach, in the area to the east, while not in itself as esthetically satisfying, nevertheless has considerable value as a safe swimming place and as a safe and dramatic viewpoint for the surf tumbling over the ledges across its entrance.

Open Saddles

The landscapes of the various open saddles in the Reserve are quite varied in character. Of these, perhaps the most interesting is the saddle between Big Dome and Whalers Knoll known as "*The Pass.*" Looking through it in either direction, one gets much the feeling that one does from looking through a high mountain pass. The bare rocky spur to the south, always colorful with flowers, descends to the strip of meadow in the bottom, in a graceful sweep of lupine, and opposite, Big Dome rises in tiers of pine and

The littoral areas of Point Lobos provide tidal pools, sea coves, geologic faults and bridges, and herbaceous growths of unusual beauty and scientific interest ►





cypress which reveal their craggy footing, while through the pass to the east only the tops of tall pines and cypresses are visible. Climbing up out of the woods from the east, one views Little Dome, interestingly enframed by The Pass with a glimpse of Cypress Headland and the open ocean beyond.

Ecologically, The Pass is one of the most remarkable spots in the Reserve; for here in a small area are tremendous differences in exposure to sun, to wind, and to sea fog, and in soil depth and runoff, so that here are to be found many species in constant competition: the two major trees, large and small shrubs, and several distinct meadow types. Here also is perhaps the finest specimen of mature cypress, neither crowded nor wind-blown, a tree from which nurserymen have preferred to gather seed for propagation.

The other open saddle to the south of Whalers Knoll is notable because of its broad sweeping views over meadows. That between Vierras Knoll and the knoll to the southwest, now used for the parking of cars, is remarkable for two smashing "views out" obtainable, at their best, from within a few feet of the edge of the sea bluffs. Here one's eyes move from the picturesque knobs of the Bird Rocks, viewed between pines and flower-decorated crags, to the sudden and thrilling discovery of the gleaming white, and hitherto quite hidden, China Beach beneath, with the surf breaking on it from the pale emerald green water of the narrow granite-bordered cove.

From the saddle, east of Vierras Knoll, one gains sweeping views of the whole south shore to Sand Hill and Whalers Knoll, over a foreground of meadow which is rapidly filling up with bushes and young pines. This fine view, unless something soon arrests the growth, is doomed to disappear.

The open saddle south of Whalers Knoll is fine because of its views over the meadows, with foregrounds variously broken by scattered shrubs and pines. The western view is terminated by the shore and the horizon, the eastern by pine woods and the mountains, with a glimpse of Carmelo Cove.

Open Hilltops

Looking out from an open hilltop gives one an expansive and uplifted feeling, the attainment of which is the principal, if unconscious, aim of the majority who climb hills for pleasure. That feeling, while it is a part of the uplift experienced by those who climb the hills of the Reserve, is certainly to be gained in greater degree elsewhere; and hence, those few people who do climb the hills of the Reserve find other recompense. One of these is the typical cover of low bushy character full of color from the yellow and orange of its *Ericameria* and *Diplacus* in the spring to the summer display of buckwheat. At the south end of the Reserve, perhaps the most worthwhile knolls to climb are those west of the park road where not only are there fine flower displays but also raking views of the shore both north and south, and interesting sights of Bird Rocks nearby.

From Whalers Knoll the outlooks are various and quite outstanding. First of all, from the summit, to the south and east, over a long expanse of buckwheat, broken here and there by clumps of *Ceanothus* and a few scattered pines, one looks out to the distant shores and islands, and over the pine woods to the mountains. The foreground, here, is formed by an ancient beach terrace, so that the top of the hill is comparatively flat, breaking

◀ Surf-battered rocks crowned with wind-dwarfed trees offer a striking contrast to the luxuriant green walls of landward cypress margins



quite suddenly into steep sideslopes. To look down, therefore, on what lies close to the hill, one must make a tour of the edge of this terrace, and then one will be rewarded with a long series of fine plunging views. Of these, one will longest remember those looking down on Blue Fish Cove, The Pass, Big Dome Cove, and on *The Old Veteran*—which, as seen from Whalers Knoll, is in silhouette against the water of Little Dome Cove far below, and gives the impression of being suspended or poised.

High Chaparral Areas

While the narrow belts of high chaparral, made up principally of *Ceanothus*, are chiefly important esthetically in their relation to the broad meadow views, they have, nevertheless, for those who care to enter them, an interest and charm definitely their own. They constitute an “elfin forest” of weirdly formed “trees” full of small animal and bird life, where wood rat nests are quite a common feature. Their soil is a deep soft duff, at times so deep that it takes a lot of heavy rain to penetrate it, so that often there is little or no plant cover.

Broad Sweeping Meadows Bounded by Varying Combinations of Pine Forest, Chaparral and the Sea

The feeling of these meadows is one of peace and restfulness. They are large enough to give the eye scope to wander, sufficiently contained by their barriers of forest, so that one is not wondering what is over the hill; simple in texture, simple in topography, leading the eye inevitably, though gently, to the restful horizon of the sea.

Of pictorial material the meadows are full, although not with the lavish richness of the north headland area. Color there is in plenty, in bold splashes throughout the spring when most of the flowers are blooming, and in more subdued but still rich tones of browns and reds throughout the long dry summer, changing with the winter rains to lush bright green shot through with the red-brown of last year's stalks; with always the little-changing foil of dull green pines, almost the dullest green of all the pines, and the ever-changing sky and sea. Pictorial depth, that separation of planes of relative distance into sufficiently simple terms to be easily grasped and enjoyed in a single view, is furnished here by the undulating forest margins and by lone trees or isolated clumps of trees standing free in the meadows, between or beyond which more pines are seen at greater distances, carrying the eye through from group to group until it comes to rest on some feature adequate to arrest it. This effect is lovely if the terminus is still more pines, but the striking views, and those most typical of Point Lobos, occur when interest is finally focused on surf-washed shore or bold rocky islands.

Beautiful as these sea-facing meadows are from a purely pictorial standpoint, they become infinitely more inspiring when one knows something of their significance in the long progression of natural change. One may be thrilled by the knowledge that the beautiful front of the meadow, gently sloping toward the sea, represents the cutting and building of a terrace by that same Pacific Ocean which now rolls against the rocks at its seaward

- ◀ Open hilltops are ancient beach terraces that now break suddenly into steep sideslopes overlooking colorful coves



margin, and that the surrounding ridge on which perhaps stand pines, is the older line of shore-cliff softened by erosion to gentle well-drained slopes where a succession of plants has built nourishing soil from the crumbling rocks until the forest now stands, held by the poorer drainage of the flat meadow, on a line often closely following the line of the ancient sea cliffs.

For flower displays of blazing color, the great meadow southeast of Whalers Knoll is outstanding, with golden poppies in March, contrasted with blue *Ceanothus* on the margins; in the show of solid splashes of red-brown *Rumex* in May, and the intermixed blue and pink and yellow of *Sisyrinchium*, *Geranium* and *Cenothera*, lovely close to, but perhaps most effective from the edges of the meadow, making vibrant variations in the reds and maroons of the *Rumex*. For interesting compositions, for a study of the old beach line and an undisturbed condition of forest margin and meadow flora, and for the interesting mound formation that is typical of the wet meadows in the Reserve, the big Mound Meadow on the south shore is most typical. Here the meadow has never been plowed and the evidence of forest clearing is small. There are, however, signs of a natural advance of pine in successive stages down from the location of the present state highway into this mounded area, with mounds, buried more or less deeply by woods soil, extending all the way up to the highway.

Each meadow has its peculiar character and its dominating note of interest. Around Carmel Cove and focused in its center is a low terrace meadow surrounded by an upper terrace largely open and also meadow, giving a fine opportunity to see the terraced formation. Northwest of Whalers Knoll is a narrow meadow contained on the sides mostly by brush-covered slopes, and strongly guiding the attention down to the *Old Veteran* cypress and the cypress-enframed cove—one of the fine views of the Reserve. Another outstanding meadow view is that obtained from the north side of Vierras Knoll looking over the very lovely bushy meadow to the panorama of the south shore as far as Whalers Rock and the Sand Hill. This is, however, apparently in a stage of rapid transition from open meadow, where grain was once raised, to chaparral, or more probably pine forest. To the south of Vierras Knoll is a similar meadow looking toward the dramatic coast to the south, showing no evidence of losing its herbaceous character in which the chief color effects in the spring are derived from *Rumex* and pure yellow *Lupine*.

In both of these areas one is unpleasantly reminded of the close presence of highway fence, cuts and traffic, and by the Carmel Highlands subdivision, and that the future might easily bring building developments on the hill east of the highway which would dominate this whole end of the "natural" Reserve. Besides these areas are numerous little meadows full of a variety of interest, tucked away all over the Reserve—well worth exploring, from the point of view of the artist, the naturalist or the less specialized nature lover.

Pine Forest Interiors

In the pine forest are three very distinct types of character. The first is where the trees are spaced quite wide and open, retaining considerable low foliage here and there, with sufficient light entering to support grass

- ◀ Rounded domes, sheer-walled on the ocean side, shelter straight-shafted cypresses on their unexposed slopes

and flowers on the forest floor. Pictorially, this is the outstanding type, with its foliage masses contrasting with the ground cover and more distant views, and composing an endless variety of vistas. The pine tree forms are of the most robust and healthy appearance in these areas. The grass and flowers and clumps of rhus, or "poison oak," make these woods always colorful with their seasonal changes.

A second type is apparently more characteristic of Monterey pine in its most favorable habitat, although (because crowded) the trees on the average have less vigor and health. This is the character of close continuous stands of tall, bare-stemmed trees, which are progressively increasing their spacing through natural crowding. Underbrush is almost entirely limited to occasional live oaks, and in a few places thickets of young pine where there have been recent openings. Pictorially, less interesting than more open and irregular stands, these areas, nevertheless, have their esthetic charm, particularly where the trees are fairly large and widespaced, and not too cluttered with spindling, suppressed trees, dying or dead or fallen, and lying criss-cross on the forest floor. The gray shafts of the trees topped by a high crown of foliage, infinite in their variations of size and curve and spacing are in many places saved from the danger of monotony of color by an occasional poison rhus vine hung in lacy reds and greens high up in a gray pine trunk.

Young trees, suppressed trees, old flat-headed veterans, dead and fallen trees, large and small, in normal quantities, all help here to complete the presentment of an unbroken life cycle which is in turn part of the longer progression of change and evolution that leads up to what one is looking at, out of the dawn of all trees, and which becomes part of the picture that includes the mound formations, extending through the trees, and the old strand terraces skirting their margins, often opening views out of the higher woods over the open meadows beneath. This type of scenery is not peculiar to Point Lobos, and, in fact, it is seen at its best in forests of other trees larger and more graceful than the Monterey pine. The principal inherent value of the pine forest at Point Lobos is that it gives background to the meadow margins and that it increases the variety of conditions typical of the coastal shelf; and the condition which will make it of added worth will be unbroken freedom from human interference.

Now we may consider the third type of pine forest effect, which is that found on steep tree-clad slopes facing north onto Carmel Bay. Here one obtains striking views, out through the tree trunks, over the bay. The value of this effect varies with the density of the forest. If the trees are too thick, the views are obscured, but not so completely that one is not still conscious that the view is there, and consequently one resents the close obscuring trees. Because the trees on these slopes grow tall and leggy, and if they are thin and scattered, they present the appearance of a skeleton forest like that left by some of the more careful lumbering operations. The strongest esthetic effects in these areas depend upon strong contrasts between foreground pattern of trees and distant views, and therefore are best seen on clear, sunny days. In the late spring there is considerable color on the floor from *Ericameria* and *Castilleja*, and in more open areas close to the shore will also be found beds of *Erigeron*, giving pretty strong doses of the three primary colors against a background of greens.

As to the locations: the two outstanding areas of the open forest type are in the long tongue of woods separating the north shore meadows from those of the south shore, and in the smaller, low area just north of the

Vierras Knoll plateau. The close-standing type is best seen along the highway from Rat Hill south. The north-sloping forest area is most typical in the bowl-like slope surrounding Bluefish Cove, although there it is thin and too full of dead and sickly trees to be at its best esthetically. Also, here is a very heavy new crop of seedlings growing up that is likely not only to smother the outlook but to obscure the rather fine effect of the bowl-like ground form, and this will certainly result in another crop of trees too tall and too weak. On the northeast side of Whalers Knoll is a variation of this type, of long standing, containing some sizable timber, living and dead, and perhaps representing the least tampered-with piece of pine woods in the Reserve. Here are to be found numerous squirrels and birds busily seeking food and shelter. This area contains some fine panoramic views, particularly interesting because they look out over and between the cypress-covered and pine-covered knolls along the north shore. Big Dome is a very striking picture when framed by these trees.

With pine forests and cypress forests, with hills and meadows and chaparral, with a sea front of spectacular aspect, Point Lobos Reserve presents indeed a wide variety of types of landscape beauty. Unique in some of its features, it remains typical of the finest reaches of the central California coast as once it was. Infinitely diverse, rich in color, dramatic in significance, Point Lobos is an abiding inspiration for lovers of the American scene.

Monterey cypress is, as a species, the most dramatic witness of past changes on the western shoreline





The geology of the Point Lobos area is well-demonstrated in the various rock outcroppings exposed on many of the headlands



Mortar holes in the granitic rock used by the Indians for grinding seeds and acorns can still be found at five locations at Point Lobos

CHAPTER IV

GEOLOGY OF POINT LOBOS *

The "record of the rocks" at Point Lobos, where the forces of surf and weather have for countless centuries battered the edge of the continent, reveals a story of many chapters.

Rocks on Point Lobos show varied conditions of origin. The granite (granodiorite), once cooled from a molten mass of rock far below the surface, has been raised up and exposed on Cypress Headland. Fragments worn or broken from it and from other rocks were heaped in layers as sand and gravel along the shore, and have since been cemented into rock which we call sandstone and conglomerate. Occasional fossils found in these sediments indicate that they were laid down in the sea. More recently, as a part of mountain-making which produced the California Coast Ranges, all of these rocks have been folded, and subjected to erosion until Point Lobos as we know it has been carved out by waves, wind, and rain.

Some of the more important events in the geologic history of Point Lobos Reserve, in the order of their happening, include:

1. Deposition of an extensive series of rocks, probably mainly sedimentary, of which now no remnants are left in the park. These may have been deformed and altered before the intrusions of the granodiorite.

2. Intrusion of the Santa Lucia granodiorite with accompanying contact metamorphism superheating the surrounding sediments by molten rock.

3. Elevation, which may or may not have occurred at the time of the intrusion, followed by long-continued erosion which removed entirely the altered sedimentary rocks above the granodiorite and cut deeply into it.

4. Deposition of the Carmelo formation, at least partially under marine conditions. At the same time older (Cretaceous) sediments and granitic rocks were probably undergoing erosion on adjacent highlands.

5. Deposition of Miocene (Middle Recent) marine sediments along the coast. This deposition continued locally to the south on the borders of the Santa Lucia Range into Pliocene time.

6. Deformation accompanied by strong shearing took place probably some time during the Pliocene. The history of adjacent regions indicates that deformation occurred intermittently through the Pliocene and probably continued into the early Pleistocene (Ice Age).

7. Erosion of the region with the development of something approaching the present topography, probably mainly by streams and wind.

8. Depression of the area beneath the sea and then emergence which was intermittent rather than gradual in its character. At certain periods the sea level must have been relatively stable to permit the cutting of rather broad terraces, each of which tended to remove traces of the previous ones. Finally there has been cut the terrace which is still beneath the sea and which is still being eroded.

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There are features of the geology of the Point Lobos Reserve which are of outstanding importance from an educational standpoint. These are: (1) The presence of a mass of igneous rock which was intruded in a molten state into the crust of the earth at considerable depth and at high temperatures, cooling slowly to form a granodiorite in which large crystals of quartz, feldspar and mica may be seen; (2) Sedimentary structures of the Carmelo formation produced by wave action in the past, similar in character to the forces now shaping this part of the coast of California; (3) The development of sea-cut terrace surfaces in the immediate past at levels considerably above present sea level, but similar in form and character to the sea-cut shelf now being eroded along the coast, and indicating recent changes in sea level; and (4) The action of the waves on a coast line composed of varying types of rocks and varying structural features.

Even the casual visitor is likely to gain some insight into the geology of Point Lobos, for here are exposed the rocks which reveal the chapters of earth history.



CHAPTER V

A "TREE ISLAND" OF MONTEREY CYPRESS *

Two rocky headlands, Point Lobos and Cypress Point, one on either side, mark the mouth of the Carmel River, which empties into the Pacific Ocean a few miles south of Monterey Bay. These headlands are small, so small as to border on the insignificant save for this, that each of them bears a narrow forest of a remarkable sort, consisting solely of one kind of cypress tree, and they have thus become endowed with a unique and singular interest. In the way of botanical observers, the trees were first seen in 1786 by Jean Francois Galoup de la Perouse, commander of an ill-fated scientific expedition from France that, two years later, was lost in the South Seas. Since that early day many other expeditions to the California coast have come and gone, and we now know definitely, after this long period of searching, that the Monterey cypress (*Cupressus macrocarpa*) does not occur at any other locality in California—nor elsewhere in the world.

The trees grow on the summits of the headlands and on the very face of the cliffs, always within reach of the flying salt spray from the ocean in times of storm. So exposed are they that the power of the sea may occasionally undermine an individual on the steep face of the rocks, and the tree falls into the thundering gulf below. The Cypress Point grove on the north headland is the larger—a half-mile long, in breadth measuring 300 yards at its widest. The Point Lobos grove lies on a higher and wider headland to the south. On both headlands the trees of the cliffs and shoreline carry in their architecture and in their outline, often boldly proclaimed against the sky, the life story of their battle with centuries of storm and wind from the Pacific Ocean—a battle which has recorded in the structural details of the tree's organs, the intensity of the struggle to maintain one last foothold on the Californian shore. The thick weave of the clustered masses of foliage, as smooth as a lawn on the seaward side, the long, gaunt arms, weirdly irregular and picturesque, the vertical structural bracing of the boardlike trunks and main branches—all these things typify combat, resistance, long-enduring tenacity.

While no two trees of the storm-driven type are alike, all give out so powerful a picture of the dramatic as to make deep appeal to the poet, the lay traveler, the mystically minded. For now three generations, a river of people, who come to see, have flowed past the Carmel shores. Frankly exclamatory, or murmuring low one to the other, or querulously skeptical as the eyes turn from the angular type of tree to another, near at hand, which is set in the beauty of its perfect symmetry—all emotions have centered in questionings. Whence came these trees? How is it that they are found only here in California? Why should they have such strange and

* By Dr. Willis L. Jepson (1869-1946), for many years Professor of Botany, University of California, Berkeley. Author of *Silva of California, A Manual of Flowering Plants in California*, and other works.

◀ "Window vistas" at

Point Lobos are an esthetic part of
the cypress forest interiors



at times peculiar shapes? In answer to these and many other queries there has grown up a large body of folk-legend as odd and as curious as the trees themselves. Some of the folk-stories insist that the Monterey cypress is the same as the Lebanon cedar of the Lebanon Mountains in Syria (a statement innocent of the botanical fact that the Lebanon cedar belongs to the Pine family and that the Monterey cypress is of the Cypress family); that the tree came by the hand of pious pilgrims from the Holy Land as a sign to the devout; that it was brought across the Pacific Ocean from Japan many centuries ago and planted here by Buddhist monks; and so on in many tones and variations.

Nevertheless, the tree has a real history, the beginnings of which are slowly being unfolded with the results of research on the geological history of the California coast and the study of ancient plant migrations. During recent geological periods the eastern part of the North American continent has been relatively stable, but during the same time the coast of California has passed through successive periods of very impressive uplift and correspondingly great subsidence. For a long time it has been a theory of the writer that during the Pleistocene epoch an extensive forest filled the south Coast Range country and extended over the area which at that time united the Santa Barbara Islands with the mainland. The changes which have occurred since, in connection with climatic cycles, are thus made to account for the restriction or localization of many of the forest trees composing that ancient forest.

The Monterey pine (*Pinus radiata*) occurs in a few small stations along the coast set in the midst of other vegetation—small sharply defined areas in which this species is dominant, and which, hence, are ecologically termed "islands." The Bishop pine (*Pinus muricata*) is also found only along the seacoast and often in narrow "islands," especially southward. The Catalina ironwood (*Lyonothamnus floribundus*) is now restricted to three of the islands of the Santa Barbara group. The Torrey pine (*Pinus torreyana*) is another highly localized species, limited to a small area on the San Diego coast and to the south end of Santa Rosa Island. The Santa Lucia fir (*Abies venusta*) grows only in the Santa Lucia Mountains. The Gowen cypress (*Cupressus goveniana*) is a dwarf growing in a few tiny areas near Monterey. As our knowledge of past time increases, we are learning that the coastal species of our native trees once had a much greater range. Well-borers on the coastal plain at Los Angeles have brought up fragments of redwood, thus extending a long distance southward the present time-range of that species. In the asphalt beds at Carpinteria, Chaney and Mason have uncovered cones of the Monterey pine in excellent preservation, a station far south of the present mainland ranges of that species. Long ago the present writer identified Monterey pine cones from the strata at Bodega Head and at Mussel Rock, localities north of the present living stations.

It is increasingly evident that we are only at the beginning of this unfolding history, and we may confidently say that the Monterey cypress is a relic of the Pleistocene, a reminder of a silva which has been subject to a long series of migrations following upon the succession of profound geological changes which finally made the California coast what it is today. Indeed,

◀ The history of the Monterey cypress suggests that it is a tree which may be on the verge of extinction



the Monterey cypress, clinging to the edge of the continental shelf, is, as a species, the most dramatic witness of past changes on the western shore line. It has seen the Santa Lucia Mountains take on their present form, with knife-like canyons cutting direct to the sea; it has seen the Coast Range foothills soften and smooth to their present velvet-flowing slopes; it has seen many forest species migrate from the mountain tops to the shore line to avoid extinction; it has seen the “Golden Gate,” that is the one main outlet to the ocean for waters from the Great Valley, move from Monterey Bay to San Francisco Bay. What a fine pageant has been this!

No other tree, from this consideration, is so deserving of the protection which can be afforded by enclosure within the limits of a park sanctuary. Its singular beauty lends to this bit of coast a special charm. No other tree on earth has so narrow a natural range, though its full history, when written, it is not unlikely, will show a range as long as California, or possibly much longer. It has today a wider horticultural distribution over the earth than any other California tree species; and yet it cannot or does not extend back naturally, that is to say, spontaneously, from the shore line over land which is now and has been barren of trees. Interesting and pregnant questions multiply constantly about it. All thought, all contemplation, all study are here in a sufficient way eminently worth the mind’s attention. It is one tree whose full history will be highly fruitful, and it will in time easily take its place by the side of those trees most well-known of the earth’s silva.

◀ Monterey cypresses grow on the face of cliffs,
so exposed that roots are frequently undermined—
to toss huge trees into the pounding seas



CHAPTER VI

A PAGEANT OF FLOWERING PLANTS *

STATEMENT

Point Lobos Wildflowers, written by Ken Legg and illustrated by Roland Wilson, and with a scientific check-list by Dr. Mason, can be purchased at Point Lobos Reserve State Park and at Monterey book stores.

Trees, shrubs, and wild flowers at Point Lobos were given "a new lease on life," when a policy was adopted by its guardians, the essence of which is to interfere as little as possible with natural processes. Protective measures have been taken, but they are not obtrusive. The result has been that there is freshness and naturalness in even the least spectacular portions of the Reserve, and from this feature many visitors derive great enjoyment.

At almost any season of the year, everywhere at Point Lobos there is color. Gold of California poppies, yellow of buttercups, creamecups, Brodiaeas, azure of the sky and sea brought to earth by blue lupine and Ceanothus, reds of the Indian paintbrush, greens of the shrubs and ferns, made darker and richer by the background of cypress leaning against the sky, and pines across the grassy meadows—these are splashes of color that continually change.

In spring, color is also splashed about with the pink of the rose, the lavender and white of the shooting stars and the Dodecatheon, related to the primrose, sometimes called cyclamen or mad violet. There are gay Johnny-jump-ups and the "wild" or yellow violets. Besides creamecups and tidytops, and purple Brodiaeas, there are rose mallow and filaree. Hung over cliff's edge are fringes of native grass and sea daisies rippling in the wind.

Some of the desert-like exposed parts of the point are painted blue and yellow by masses of lupine. This hardy member of the pea family thrives well roundabout Carmel, growing high at times—fragrant with the yellow or the blue flowers. There are annual, biennial and perennial varieties. The bush lupine, which needs abundant sunshine, grows in sandy spots. There are places on the Point where in springtime and early summer one can walk through veritable lupine thickets—almost lost in the clouds of blue.

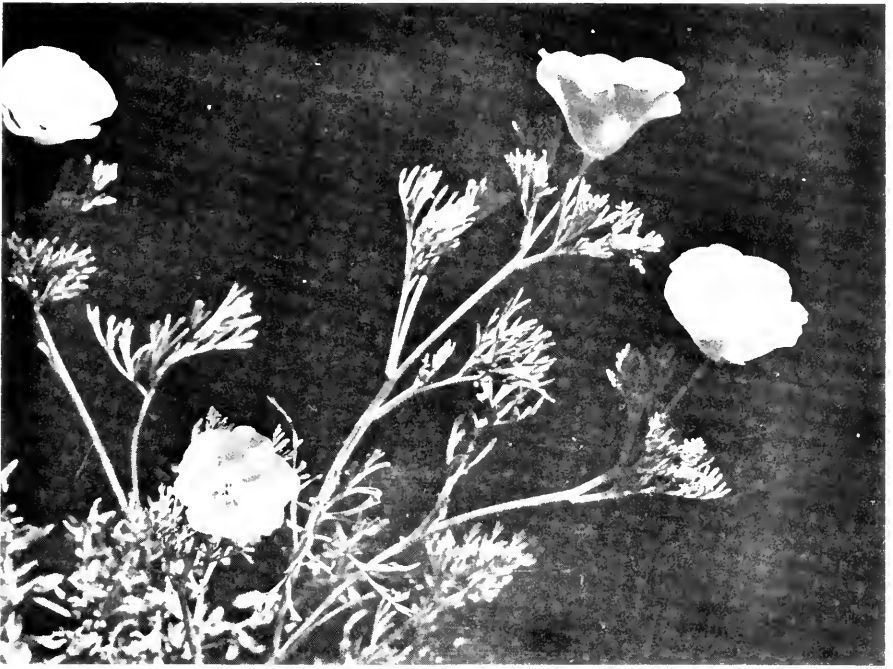
As a "plant refuge" Point Lobos Reserve performs an important function in giving complete protection to one species of great significance to California. For this species is officially its state flower, rapidly disappearing. The Spanish called it *Copa de oro* or "cup of gold," but the botanist has named it *Eschscholtzia californica*, and popularly it is called the golden poppy. The scientific name of the poppy was acquired when a Russian scientific expedition under Kotzebue, in 1815, explored the California coast—

* Based on a special report by Herbert L. Mason, Professor of Botany, University of California.

◀ Broad sweeping meadows, bounded by majestic Monterey pines, are covered in spring with a profusion of colorful wildflowers



Bush lupine (above) and cream cups (below) add intense yellow color to the green fields in the spring



California poppies (above) and tidytips (below) are colorful members of the spring parade of wildflowers at Point Lobos

land. Chamisso, naturalist with the expedition, named the species for Dr. Eschscholtz, a companion naturalist.

As one wanders the meadows of Point Lobos in spring, one is likely to think that no state has chosen its representative flower more appropriately than California. The gold of this poppy seems to have the very essence of California sunshine woven into its brightness. During the spring it covers field and mountainside with a cloth of gold. In the past, when it was more prevalent, men and women and children made a festival of gathering the poppy, as the Japanese do with their cherry blossoms. And tradition has it that many a vast field of these poppies used to serve as a landmark, almost as a beacon, to coasting ships offshore; that in old Spanish times the coast often was called *The Land of Fire*, and that on occasion thanks were given "to sacred San Pascual who had spread a golden altarcloth upon the hills."

Including trees and shrubs, close to three hundred species of flowering plants have been counted on the varied terrain of Point Lobos. There are other plants, too, such as the marine algae, or seaweeds, and lichens and mosses, all of which have interest for botanists. To such, the list of flowering plants at the end of this chapter will especially appeal.

To many people, however, the main impression in most of the months is that a great wealth of bloom, in color masses, adds embellishment to the striking vistas of sea and headland.

Not only in the number of separate species is Point Lobos notable, but also found here within small compass is an unusual variety of groups or associations of plants.

These are the general divisions of the flora of the Reserve: (1) The cypress groves of the headlands along Carmel Bay, (2) the pine forests of the areas back from the ocean, (3) the meadow flora, (4) the sea-bluff flora, (5) the shifting sand flora, (6) the ruderal flora, on the formerly tilled lands, (7) a soft chaparral flora on the northwest face of Whalers Knoll and in the quarry back of Carmelo Cove, (8) the marine flora in the surf. A large proportion of the Pacific Coast seaweeds was first discovered in the vicinity of Point Lobos, making this region the type locality for these species and the source of authentic material for the future.

The more one explores Point Lobos, the more there are revealed, in its varied plant life, forms both beautiful and curious. The "rock gardens" along the inaccessible bluffs above the surf are teeming with succulents tinted in pastel shades of green and buff and rose.

The mosses and lichens are features of great interest to many. The almost weird "atmosphere" on portions of Cypress Headland can be in part attributed to lichens, which are rather conspicuous elements of the vegetation.

Both the Monterey cypress and the Monterey pine are often heavily festooned with a light gray-green "moss." This is the lace lichen, which is quite abundant. Look closely and you can see that it is made up of lacy nets with meshes from pinpoint fineness to the size of a pencil, when full grown. On the points near the sea, this lace lichen is matted by the winds, frequently torn and shredded. Yet back in the sheltered pine groves of the Reserve, better specimens are found. Here the lace is luxuriant, hanging from the branches like the folds of a Spanish lace shawl; near the War-

den's Cottage and to the Point it hangs somberly and drifts slowly in the breeze.

This is not the Spanish moss, like that found in the Southeastern United States. Spanish moss has flowers, and belongs to the pineapple family, so the botanists tell us. The lichens at Point Lobos are not flowering plants; they are composed of a fungus and an alga.

There is another lichen abundant at the Point—the kind that is seen on the dead twigs and on the rocks. It spreads out in all directions, forming a fuzzy-looking brush, dull olive green to nearly black. Old weathered rocks often owe their color more to lichen than to the rock minerals themselves.

The trees overlooking the bay have their lower branches covered with a growth of red algae. However, we are assured by scientists that this does no damage, since it appears only on dead twigs and on the bark of the living branches and not on the green leaves. But this alga does add color and so contributes interest and beauty to the groves.



CHAPTER VII

ANIMALS, LAND AND MARINE *

“Is there much wild life at Point Lobos?” asks the visitor as he considers the comparatively small area in the Reserve of 354 acres.

The answer is a definite affirmative. During one year Dr. Joseph Grinnell and Dr. Jean M. Linsdale observed the presence here of 176 kinds of vertebrate animals—10 amphibians and reptiles, 19 mammals, and 147 birds. Both as regards species and individuals, the count was high in Point Lobos Reserve. They ascribed this partly to the number and diversity of habitats represented, including grassland, brushland, forests, ocean shore, and islands.

Next to the spectacular beauty of the Point, this presence of wildlife is among the most arresting features. Here it is possible to observe in a primitive environment many plant and animal species living in interesting relationship to each other.

Nearly every plant or animal seen at Point Lobos, with but few exceptions, may be seen in abundance by most Californians at some locality more conveniently accessible than here; but in few places can they be freely examined and studied under undisturbed natural conditions such as are maintained at this Reserve. For example, most visitors to this area are no doubt only slightly interested in white-crowned sparrows themselves, for these are common backyard birds, but here this species of bird is seen in normal responses to its natural environment.

Nor has the program followed here been to preserve permanently any specific objects now occurring in the park, but primarily to insure freedom for all the natural processes which have produced those objects and which if permitted to continue will, it is believed, tend to maintain them for a long time in their most valuable form.

Of those natural habitats which attract the wide variety of animals to the Reserve, grassland makes up a larger portion than any other. Several predatory species normally range here, where their prospects of finding suitable prey are greater because of the virtual absence of obstructing vegetation. This in turn requires that animals which live in this low vegetation be so colored as to escape easy detection or that they have access to burrows into which they may escape from view. Such a habitat encourages the exercise of acuteness in the senses of sight and hearing, and of alertness in starting to escape when danger threatens.

Seeds, roots and insects constitute a food supply for a few mammals, such as gophers, mice, and ground squirrels. Dr. Grinnell and Dr. Linsdale estimated that mammal workings are extensive enough in a year's time to disturb every bit of the surface of the soil of all the grassland to a depth

* Based on a special report by Dr. J. Grinnell and Dr. Jean Linsdale, 1934-35.



of close to one inch. Presence of seeds and insects, and freedom of movement or vision, attract several kinds of birds which are so closely dependent upon these situations that they come only as long as the conditions prevail.

Conditions in the brushland favor the animals with restricted power of escape from pursuit and the ones which are accustomed to capture prey by making short dashes. Lupine and *Ceanothus* particularly provide shade, screen, and food for many species.

The trees of the forest—oak, Monterey pine, cypress—provide the accommodations for animals usually associated with trees of some sort. As has been emphasized, the presence of the Monterey cypress is responsible more than any other single circumstance for the selection and maintenance of Point Lobos as a state reserve. It is somewhat of a surprise to find that few species of vertebrates are satisfied with the cypresses for living quarters. The extremely dense foliage of the trees and the heavy tangle of branches present an almost solid wall which few animals care to penetrate. Under the trees, juncos (the year round), linnets and thrushes (in the winter) are accustomed to forage; winter wrens forage in the very densest branch-work. A few other species feed among the more open portions of the tree tops. Of these the only one that shows preference for the cypresses over the pines is the Townsend warbler. Wood rats commonly build nests among the limbs of cypresses.

The ocean shore is the forage ground and nesting site of numbers of birds, as discussed in the following chapter. The second largest group of islands, known as Seal Rocks, is the hauling-out place for a large herd of Steller and California sea lions. The factors of safety and conveniently available food seem to account for the presence of these animals.

Weather conditions vary markedly, also. A slight slope toward the morning or afternoon sun greatly increases the warmth of certain strips of land. Added to this, the various rises and knolls are effective in deflecting the course of the wind so as to produce many types of climate locally within this comparatively small area.

MAMMALS FOUND IN POINT LOBOS RESERVE

- Mole—*Scapanus latimanus* (Bachman)
- California Bat—*Myotis californicus* (Audubon and Bachman)
- Brown Bat—*Eptesicus fuscus* (Peale and Beauvois)
- Coon—*Procyon lotor* (Linnaeus)
- Striped Skunk—*Mephitis mephitis* (Schreber)
- Wildcat—*Lynx rufus* (Schreber)
- California Sea Lion—*Zalophus Californianus* (Lesson)
- Steller Sea Lion—*Eumetopias jubata* (Schreber)
- Ground Squirrel—*Citellus beecheyi* (Richardson)
- Gray Squirrel—*Sciurus griseus* Ord
- Pocket Gopher—*Thomomys bottae* (Eydoux and Gervais)
- Pocket Mouse—*Perognathus californicus* Merriam

◀ Steller sea lions form interesting habitat groups in the California Academy of Sciences

- Harvest Mouse—*Reithrodontomys megalotis* (Baird)
White-footed Mouse—*Peromyscus maniculatus* (Wagner)
Wood Rat—*Neotoma fuscipes* Baird
Meadow Mouse—*Microtus californicus* (Peale)
House Mouse—*Mus musculus* Linnaeus
Jack Rabbit—*Lepus californicus* Gray
Brush Rabbit—*Sylvilagus bachmani* (Waterhouse)
Black-tailed Deer—*Odocoileus columbianus* (Richardson)

Steller Sea Lion and California Sea Lion

Of all the mammals at Point Lobos the Steller sea lion attracts more attention from visitors than any other. Not only is it the predominant species on the rocks off the shore near the tip of the point, but groups of individuals are seen frequently in the water close to shore. The animals are present the year round, but their numbers seem to increase considerably in the spring, about the middle of April.

Sea lions may be distinguished easily from seals by the presence of an external ear, by their much longer necks, allowing them to carry their heads high, and by their active, sportive, and noisy natures. Seals are clumsy, short-necked, quiet animals.

The fur seal, not seen on this coast, is also a sea lion but he has a thick under-fur not found on these species. Some writers claim that sea lions received their name because of the lion-like appearance of the faces of some of the huge males. Others say it is the fur manes of the animals which suggested their names.

Not so large as the Steller sea lion, and far more intelligent than a seal, the California sea lion is the one you have nearly always seen balancing a ball on the tip of his nose in some circus or on a vaudeville stage. This fellow can live quite easily in fresh water.

The California sea lion inhabits almost the entire coast of California. It is always associated at Point Lobos with the Steller sea lion, though it is represented by a considerably smaller number. The dark coloration, the "hump" on the forehead, and the bark which resembles that of a hound, are characteristics which in combination serve to distinguish this species. Apparently the two are friendly, at least when on these rocky resting-places. Most of the time they are crowded together in "bunches," both Steller and California sea lions in the group, but those of the California species keep fairly close together within the group. Two individuals of the same species sometimes snap at each other; not so frequently two of different species engage in a skirmish. Even the old males, who do most of the fighting, are timid if approached by a man.

Usually sea lions are seen hauled out on the rock surfaces above reach of the surf, lolling about, sprawled out, prone, with only rarely even a head raised. The animals seem to be sunning themselves, with no concern for any kind of outside disturbance. Counting them from the shore is almost impossible because the animals keep so close together, often appearing even to be across one another.

On the lower ledges, evidently just out of the water and still wet, they nearly always look shiny and dark-colored. The ones high on the rocks, apparently dry, are dull and golden brown in color. Seen swimming beneath the water they may appear distinctly green.

Steller sea lions are the largest of any sea lions—the average estimated weight of an adult male is about 1,400 pounds, and they measure from 10 to 11 feet in length.

The sounds made by the Steller species when on the rocks are much like those made by a herd of cattle—possibly with a slightly lower tone. Sometimes they are deep-toned snoring sounds, as if the animals are growling in unison. On still nights these sounds can be heard easily at the Warden's House on the opposite side of the Reserve.

When disturbed, the herd will generally rush off into the water in confusion, causing great commotion. After swimming about for awhile with raised heads the sea lions return to the rocks, which they climb easily.

Small groups of sea lions are often observed in Point Cove in the surf, tumbling over one another, diving, and coming up with their heads together. Apparently these maneuvers are in the nature of play.

Compact groups of sea lions are sometimes seen swimming at the surface of the water. This animal swims with an undulating motion up and down, coming partly out of the water on each upward curve. Sometimes an animal comes up with such momentum that it emerges completely out of the water. Occasionally a head of one will be projected above the water and at times a front flipper will be extended upward into the air. Such compact groups of sea lions are followed by many birds, mostly Heermann and Western gulls.

Sea lions will also hunt in packs like wolves. Both of these species live on fish, squids, crabs, shellfish, and devilfish or octopus; but the California sea lion eats comparatively few fish, while a sea lion of the Steller species finds fish the staple of its diet.

Ground Squirrel

Its large numbers and the many ways in which it affects its surroundings make the ground squirrel one of the important mammals on Point Lobos Reserve. The population probably runs as high as the area can well support—a number somewhere near 2,000. The squirrels choose ground clothed with vegetation that is low, or has scattered boulders and bushes to be used as lookout posts, or any slope, especially toward the east, where the soil is well-drained and where they can expose themselves to the sunshine.

Squirrels, which attract many carnivores to the Reserve, take alarm easily. Disturbed by a person, a squirrel may hurry off a short distance to where it can turn and sit on its hind legs to stare at the disturber. Chased by a dog, it may turn when it is safe to bark at the dog. Ground squirrels can be seen in large numbers in open places, and frequently members of a pair will chase each other in play while chattering rapidly. When frightened they give a sharp bark of alarm.

They keep the ground covered with burrows, which they dig with their forefeet. Foliage and green herbaceous plants supply them with food.

Gray Squirrel

The gray squirrel is one of the conspicuous mammals in the Reserve, partly because of its large size and unafraid disposition, partly because it is active in the daytime through the whole year, and partly because of the everpresent signs of its home and feeding habits. Estimates of total numbers in this area vary upwards from one hundred, depending upon the time of year.

One word—pines—is enough to characterize the habitat of the gray squirrel at Point Lobos. Squirrels are found all through the pine woods and none is seen far from a pine tree. In these trees all the essential needs of this animal are fulfilled. The branches provide safe refuge from ground prowling predators; also in the tops of the trees are support and materials for the nests.

Dependence of the squirrels upon the seeds of the pines for food is close, although they are not restricted to this one source. Squirrels carrying fresh cones, held at the base with the small end pointed forward, are seen often, both on the ground and in the trees. Many times it is necessary for squirrels, in getting access to the cones out on the limbs, to cut off obstructing small branches and stems, which fall to the ground, making a conspicuous litter. They do not strip the bark, but make a clean cut. The greatest amount of this cutting seems to occur in mid-April. They also feed on the upper part of the large toadstools which are abundant during the rainy season. Another food source for gray squirrels in the Reserve is the acorn crop on the live oak trees. They crawl sometimes to the very tips of some of the outermost branches, and there they hang head downward, holding on only with their hind feet. Having cut an acorn off with its incisors, a squirrel will back up or turn around to reach a more secure position. The acorn is then transferred to its forefeet and the squirrel proceeds to hull and eat it.

Gray squirrels can go all through the woods without coming to the ground, following along familiar overhead ways without hesitation, jumping across the interval between branches of adjacent treetops as high as fifty feet up.

Responses of gray squirrels to the near presence of humans varies widely. Usually they retreat to safety, but sometimes they protest loudly by barking and sometimes by rapping on the wood with their forefeet. One gray squirrel observed came directly to a person who sat stock-still with his back against a pine trunk at the edge of Mound Meadow. The squirrel climbed onto his knee, looked him in the eye for about two seconds, then without any appearance of sudden alarm, took a course without haste back into the woods.

Pocket Gopher

On approximately one-third of the land at Point Lobos pocket gophers play the predominant part in modifying the physical character of the upper soil as well as in affecting the plant life and, less directly, the animal life there. They avoid three general types of ground: (1) the forest where there are few small roots; (2) the wet, soggy ground, where they cannot keep dry; (3) the oldest, longest established grassland, where, possibly, the sod is composed of roots too fibrous to be suitable as gopher food. The abundance of herbaceous plants with thick stems and roots provides ample food. Salt grass, occurring in patches in Mound Meadow, is preferred provender of the pocket gopher.

An estimate of the average number within the Reserve during a year in which they were closely observed (1934-35) was about one thousand. A

The friendly Beechey ground
squirrel is one of the more numerous mammals
to be found at Point Lobos ►



population-regulating factor of great significance in long-time processes is the presence of predators such as the barn owl.

The extent of the ground workings of a pocket gopher is shown by counts made on an area 3 paces long by $2\frac{1}{3}$ paces wide, where there were 64 eruptions—fresh ones since the last rain. These varied from mounds of normally large size down to holes plugged level with the surface, where stems of grass had been trimmed off above ground. This was evidently all the work of one gopher.

Harvest Mouse

The harvest mouse is one of the most numerous rodents in the Reserve. These mice are abundant in late summer and fall in all the types of grassland, even on the most recently grass-covered ground. In summer and fall they may be found in the pine woods, especially where the floor is covered with grass; and pine needles, sections of logs, and remains of stumps provide refuge places for them. The bush-covered slopes of Vierras Knoll are well populated with these mice.

Their nests are globular in form, the top well above the ground. The nests are nearly always well-concealed from above with a loose thatching of grasses and brush.

Meadow Mouse

In mats of dead grass and other plant material, meadow mice make a network of runways, which, during the year, extend to nearly every section of the Reserve. They are present in great numbers, not only in the grassland, but throughout the brushland habitat and a great many are present on the floor of the pine woods. Several kinds of hawks fly back and forth across the meadow mouse colonies, obviously watching for opportunities to pounce upon these mice, which are to be caught at almost any time because they work both during daylight hours and at night. In fact, the marked increase in numbers of hawks on the area through the summer can be attributed largely to the increase in the numbers of these mammals.

Other Noteworthy Mammals

Numerous tracks of coons have been found on the sand at Gibson Beach, indicating that they have gone all over the beach and especially to the drift masses of kelp and edges of rocks along the tide line.

Striped skunks live in the Reserve in some numbers.

Only a few jackrabbits, easily identified as they race along, doubling back on their tracks, leaping over bushes, are permanent residents here. More brush rabbits than jackrabbits live here, but they are hard to detect in the thickets. They cannot accommodate themselves to strong sunlight and are rarely seen even in moderate shade.

The presence of wood rats in the Reserve is chiefly revealed by their nests, found in the pine woods, mostly among the live oaks there, but also in thickets of *Ceanothus* and poison oak, and among the cypresses. These nests are built of soft materials such as leaves and grass, but they are piled over with coarse sticks, twigs and leaves, sometimes to a height of several feet. The nests then resemble a dead bush under growing bushes.

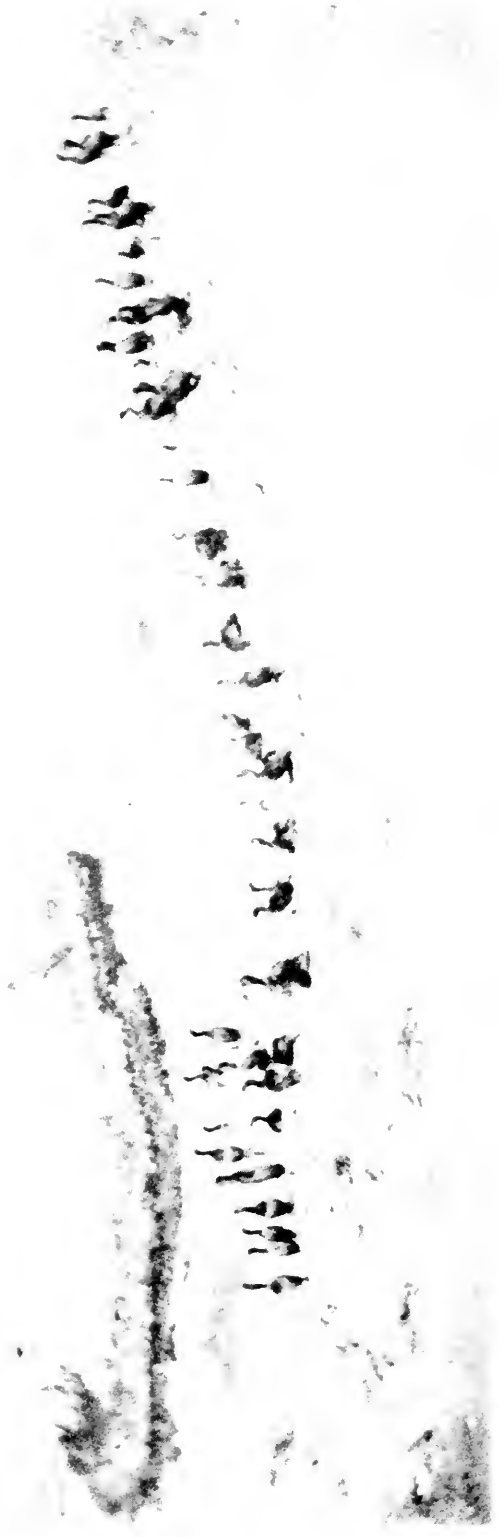
AMPHIBIANS AND REPTILES FOUND IN POINT LOBOS RESERVE

- Slender salamander—*Batrachoseps attenuatus* (Eschscholtz)
Oregon salamander—*Ensatina eschscholtzii* Gray
Arboreal salamander—*Aneides lugubris* (Hallowell)
California toad—*Bufo boreas* Baird and Girard
Pacific tree toad—*Hyla regilla* Baird and Girard
Fence lizard—*Sceloporus occidentalis* Baird and Girard
Alligator lizard—*Gerrhonotus multicarinatus* Blainville
Gopher snake—*Pituophis catenifer* (Blainville)
Garter snake—*Thamnophis ordinoides* (Baird and Girard)

Slender salamanders occur in small numbers throughout the pine woods and on certain portions of the grassland.

The Pacific tree toad is apparently the most numerous species of amphibian at Point Lobos. The absence of permanent freshwater ponds, except for a wooden trough south of Whalers Knoll, has limited the extensive development of them. Tadpoles have been found in many temporary ponds, but as these dry rapidly, the tadpoles do not often have time to transform into frogs before the water is gone.

Fence lizards are the commonest species of reptile in the Reserve, but are not sufficiently numerous to be met with every day. They live in a variety of situations from near the edge of the water on the beach back through the pine timber. They sun themselves on the sandstone cliffs and granite boulders as well as on cypress and pine logs. The presence of several road runners here may be a considerable factor in keeping the numbers of this species low.



Cormorants constitute a high percentage of the water birds found at Point Lobos

CHAPTER VIII

BIRDS OF SHORE AND SEA*

Point Lobos Reserve is a veritable haven of refuge and an expansive banquet table for the birds. At all times, they gather there in great numbers. Some are year-round inhabitants, some are seasonal, and some are merely wayfarers bound for more distant fields. The "through" migration of land birds, however, is surprisingly weak. In the main, arrivals and departures become evident only in spring and fall, and these movements take place gradually over a period of many weeks. There is no migrational "rush" at all. The winter and spring population is heavier than the summer population; furthermore the birds seem to leave the Reserve after the nesting season, before the food supply has been noticeably reduced.

Birds occupy all the habitats of the Reserve. Of the 147 kinds of birds noted by Grinnell and Linsdale, 28 percent of the species listed owe their presence directly to the influence of the ocean.

On the shore, turnstones, oyster catchers, and other shorebirds, as well as such land birds as Audubon warbler and black phoebe, forage regularly. Pelagic cormorants roost and nest on certain nearly vertical, conglomerate cliffs, as also do cliff swallows in large numbers, and occasionally black phoebes and duck hawks. This use is evidently because of inaccessibility of the sites from disturbance, and the suitability of the niches and shelves for nests. Several islands support nesting colonies of Brandt and pelagic cormorants, and pigeon guillemots. The largest, Bird Island, near the southern boundary of the Reserve, is permanent headquarters for a colony of brown pelicans. Several pairs of black oyster catchers and many Western gulls generally nest on the islands.

OCEAN BIRDS

Brown Pelican

Conspicuous among all the birds in the Reserve, the brown pelicans make their home on Bird Island. Only known breeding colony of these birds north of the Channel Islands, it is likely to remain the home site of large numbers of them if left undisturbed by man.

These large, peculiarly constructed birds are here the year around, although during late winter and early spring there may be days when no pelican is in sight. Probably 200 or more are permanent residents, but in the early autumn the travel season begins with a great influx of pelicans from colonies on islands of Lower California and the mainland of Mexico. As many as 3,000 pelicans gather on these rocks by the late fall, probably attracted by the resident birds, and the favorable roosting site.

They are quite easily seen from shore as they tend to gather on the leeward side of the rocks, where they are somewhat protected from the wind. Particularly is this true in winter.

The breeding cycle of the pelicans has not been definitely determined, because no one goes out to the rocks any more for fear of disturbing the

* Based on a special report by Dr. J. Grinnell and Dr. Jean Linsdale, 1934-1935.

birds; but from mainland observation it seems that they begin to pair off as early as February. By April some of the nests are built, and by May there are two or three eggs (sometimes, though, only one) in each nest.

The nest building procedure is for one bird to stay on the spot while the other goes for material, collecting sticks and weed stems. Then, standing beside the nest spot, it opens its bill and shakes out the sticks and stems, which are taken and arranged by the sitting mate. The highest sites seem to be most desired, for the birds crowd there and are most active in driving away intruders.

Nests on Bird Island are situated mostly in compact groups on the north end, the middle hump, and the foot of the south hump. The birds relieve the monotony of incubation by frequently stretching and preening. Sometimes they flap their wings hard enough to blow the feathers of a neighbor.

The number of young hatched on Bird Island varies greatly from year to year. Since 1927 the number has ranged from none to 78.

The naked young are kept covered by the brooding parent and are not so often seen, though sometimes with a telescope the young pelican can be observed feeding from the open bill and pouch of its parent. This is the way the young are fed until they are able to fish for themselves—even as late as August and September of the year.

Pelicans occasionally can be seen fishing in the narrow channel between Seal Rocks and the mainland and in the general vicinity of the tip of Cypress Point. However, the greatest number appear to fly off to some more distant place to the northward. The birds both leaving and returning usually fly close to the water, at times seeming almost to touch the waves.

When food is sighted, the procedure noted most often is for the bird to turn back and drop to the surface of the water, then to make quick jabs with its opened bill—sometimes only a few and at other times many. Only on rare occasions have the pelicans been seen to go partially or completely below the water.

A striking feature of the behavior of the brown pelican is its marked trait of flying over the ocean and avoiding the mainland during the early part of the year. After the middle of the summer these pelicans take to flying across the mainland at times. Grinnell and Linsdale guessed that this was either because of the economy of flying over prospective fishing areas or because they felt a greater degree of safety when over the water.

Brandt Cormorant, and Pelagic Cormorant

These two species, not easily distinguished from each other by many visitors, offer continuous demonstration of two diverse ways of coping with one environment by separate, closely related species present here in abundance, but not readily observable at many other places along the Pacific Coast.

Greater numbers of Brandt cormorants nest at Point Lobos than of any other ocean bird. Because these birds like to perch and nest on the outer seaward sides of rocks and islands, it is practically impossible to count the numbers present; but it has been estimated that between 300 and 500 individuals live within the limits of the Reserve—that is, during the nesting season, when the greatest number are present.

They can be seen on the tops of all "humps" of islands, and quite often they form a fringe of thick black dots along the skyline of almost the whole

of Bird Island, which is by no means the exclusive property of the brown pelicans.

A marked change in the behavior of the adults in the colonies is noted as the season progresses. At an early date, before the "nest-situations" are well defined, the birds are unstable and easily frightened from the rock. Later they become fixed in their positions and are not readily disturbed from them.

By March the birds begin to gather green land plants and sea plants for their nests. The sea plants are secured generally from the coves, where they dive to the bottom for about 35 seconds or so, and come up with the nesting material in their bills. They also get nest material by thieving from each other.

By late May the birds can be seen on their nests, and by the end of June the young are hatched and only a few broken nests remain. In July great flocks of Brandt cormorants have been seen flying northward, past Point Lobos and over Carmel Bay.

Brandt cormorants can be seen at nearly all times at the Reserve, either on the islands, in flight close above the water, or diving for food.

Pelagic cormorants are present in much smaller numbers. They are also smaller in size, with thinner necks and heads, slenderer builds. These pelagic cormorants have more rapid wing-beats in flight than the Brandt cormorants. The population is about equal to the much more conspicuous brown pelican, and scarcely more than one-third as great (probably much less) as that of the Brandt cormorant. This bird is less strictly localized, even on so small a stretch of coast, than the two relatives just mentioned. Roosting and nesting places are scattered all along the shore of the Point. Groups do not generally reach more than 100 individuals. When the nesting season arrives, pelagic cormorants evidently break up into smaller groups than on their roosts.

One or more pelagic cormorants feeding or in flight usually can be seen by watching for a few minutes at almost any place along the shore. A favorite feeding spot for certain individuals is Carmel Cove, where they catch fish and occasionally bring up a crab from the depths.

Western Gull

Among the several kinds of gulls, only this one is a permanent resident at Point Lobos. Its large numbers and aggressive nature make it important here in the animal community along the shore. It is seen in all parts of the area—in the water and on the islands and rocks close to shore, on the ground close to shore, or in flight anywhere, very often over the woods.

The Western gull searches over a wide variety of forage ground. One favorite source of food is the refuse left at tables by picnickers and along the shore by fishermen. Another type of forage niche of a more nearly natural sort, and rather peculiar to gulls, may be noticed often during low tide. Along the sea cliffs where the rock surfaces rise vertically out of deep water, single, scattered Western gulls commonly feed over the rocks uncovered at low tide, as well as at certain favorable spots on the ocean away from the shore.

The breeding season is a long one. By August most of the young gulls are in dark plumage and able to fly, although they still beg for food from the adults. As late as December young gulls have alighted beside adult birds, have opened their bills near the heads of the older gulls and have



uttered high pleading notes, though the older birds generally ignore them by this time. The adults occasionally remain stationed at nesting sites until fall, even after the young have gone.

LAND BIRDS

Point Lobos Reserve lies in what may be termed a *Transition Life Zone*. To the north is the Boreal and to the south is the Austral zone. Vertebrates typical of both zones are found at Point Lobos, though 60 percent of them belong to Austral species, and only 26 percent to the Boreal. In addition there are some species present—like the Allen hummingbird, Western flycatcher, violet-green swallow, pigmy nuthatch, and purple finch—about 14 percent, which belong specifically to the Transition Zone itself. The last percentage is fairly normal for Transition anywhere; for this zone is essentially merely one of overlap between Austral (or Sonora) and Boreal (in its Canadian division).

Allen Hummingbird

The busy Allen hummingbird, flitting rapidly from flower to flower, hovering over a blossom to take the honey, always attracts attention. Of Austral zone origin, the bird is of peculiar interest because, in spite of its great powers of flight individually and its seasonal migrations, it is restricted in its breeding to an astonishingly narrow range—to the “fog-belt” of California, from the Oregon line to San Luis Obispo County. Nests have been found beyond these limits but rarely. These hummingbirds are not known to nest farther than 20 miles from the sea.

The species has no counterpart in the Sierra Nevada; though it does have in the coast belt north of California. The life zone is thus chiefly Transition.

Males and females of this species occupy separate types of environment nearly all the time. Grinnell and Linsdale, at the time of their study of Point Lobos, thought some 15 females lived in the area then, but not more than one-third this number of males.

Santa Cruz Chestnut-backed Chickadee

The Santa Cruz chestnut-backed chickadee, quite sharply characterized by gray instead of rusty or chestnut-colored sides, is restricted to the narrow, humid, coast belt south from San Francisco interruptedly as far as Cambria, San Luis Obispo County, where, significantly, occurs the southernmost mainland stand of Monterey pines. This bird seems to require the presence of coniferous trees for a suitable environment. Its relative, the mountain chickadee, is found in Monterey County only a few miles in an air line from the Reserve, but the two species are separated on some subtle basis—possibly connected with differing degrees of climatic humidity. There is no record of either kind of chickadee in the area of the other.

When a survey was made in 1935, there were about 50 chestnut-backed chickadees resident within the Reserve. Foraging places for these birds include all of the kinds of trees found here. Nesting begins in March and

◀ Bird Island, off the south shore of the Reserve, is a veritable haven of refuge for many of the 147 species of birds identified in this area

the bob-tailed young ones can usually be seen in May. A characteristic of their nesting sites, which are from 4 to 10 feet from the ground in cavities in stumps of rotted pines, is that practically all of them are closely surrounded by thickets of young pines or are screened by low boughs of taller trees. The entrance then, while close to the ground, is hidden from view. The birds contribute to the concealment by making quick silent flights to the nests without any pause at the entrance. By nesting at this low level the chickadees avoid the stratum normally inhabited by the pigmy nuthatches. These might be fierce competitors of any small bird attempting to nest in the cavities within the vertical zone frequented by it.

Monterey Pigmy Nuthatch

Visitors are attracted to birds of this species because of their almost continuous notes, and also because of their large numbers and gregarious habits. As many as a hundred of these small birds will be here in nesting season, though they are present in some numbers throughout the year. The nesting period is a long one, preparation of nests sometimes beginning in February. Nuthatches dig their nesting cavities in pines or the dead remains of pines. The sites selected are high ones, averaging 30 feet above the ground and running as high as 60 feet. While the two species of birds have about the same forage beat and cruising radius, often indeed seem closely associated, the nuthatch seeks (at least in the season of greatest food scarcity) static insect food in crevices of dry cones, twigs, and smaller branches, and it uses its specialized digging tool, the bill, to dislodge or uncover these insects. In other words, the nuthatch has a food source beyond the usual reach of the chickadee. And then, too, with suitably rotted boles of trees available, it digs its own nesting cavity.

Pigmy nuthatches appear always to dig hurriedly and persistently. Blue-birds are the most formidable competitors of this species for nest sites, and in several instances, in which the entrances were of sufficient size, they have temporarily or even permanently ousted the smaller birds from the cavity.

Road Runner

Road runners are present in sufficient numbers, and their chosen surroundings are so close to the routes traversed by visitors, that these birds attract special attention and are an emphatic reminder that Point Lobos shares many characteristics with the arid interior of the Southwest. Road runners are not known to approach the sea so closely north of Monterey County.

One mannerism of the road runner is to raise its feathers to expose the skin of the back to the sun. While foraging, the bird may flip its wings open widely at intervals of a few seconds, possibly to frighten the grasshoppers into action so that they may be detected more easily.

On one occasion, a road runner was discovered in the narrow roadway south of Vierras Knoll. It kept in the road ahead of an automobile which was speeded up to pace the bird. At the rate of exactly 10 miles per hour the bird appeared to be too closely pressed and it suddenly veered off into a patch of lupine bushes on the uphill side of the road.

Headquarters for each road runner, or pair, seems to be in an area of tall bushes, mainly *Ceanothus* in this locality. From such centers the birds forage out among the smaller bushes, or the adjacent grass-covered ground, sometimes as far as a quarter of a mile. When disturbed by a human, either on foot or in an automobile, a road runner out in the open will nearly always

immediately cease its hunting activity and after a brief survey of the situation, hurry back to the protective margin of the pine woods or even for a short distance among the trees if these are scattered, but none of these birds are seen in the main woods. They show a marked tendency to travel along the roadways and paths, probably on account of the freedom of movement permitted there. Also, it may be easier to sight prospective food objects in such a situation than amid the dense tangle of grasses.

Not all of the time is spent by road runners on the ground, for each individual seems to have certain favored perching places where it may be found often. Road runners give a series of cooing notes in the breeding season. At other times they have a rattling note.

Bush-tit

The flock behavior and peculiar nesting traits of this Western bird make it one of the permanent attractions, especially to visitors acquainted with birds in other regions.

Bush-tits are present continuously throughout the year at Point Lobos. About 100 are around at the beginning of the nesting season. All through the winter, bush-tits are seen in flocks averaging about 15 birds each.

Their nest-building season starts late in February and most of the nests contain young as late as the latter part of April. Bush-tits build nests in a wide variety of plants, nearly every kind of tree and bush in the area being used, which is a peculiar characteristic in any bird.

Linnet

The fact that the linnet is so widely abundant through the farmed portions of California makes more significant the added fact that it is also a prominent feature of the landscape at Point Lobos. At this locality we may expect to learn the true nature of the adaptation of the bird to its normal surroundings. It is one of the few kinds of animals to make important use of the cypresses.

The linnet is one of the most conspicuous singing birds, and is just about the last species of bird to be quieted by a cold and overcast sky. In the building of nests, the usual procedure seems to be for the female to gather and carry to the nest most of the materials, and for the male to accompany her and sing. The linnets use lichens chiefly for the main construction of the nest, generally building on the limbs of trees, although sometimes they use cavities and crannies in stumps. Both pines and cypresses are occupied by their nests, which are usually well concealed among lichens or masses of trash on tops of flat limbs or boughs. Approximately five weeks, starting generally in April, are required for nesting, from the beginning of building until the nest is left.

Ordinarily linnets exhibit a marked preference for open places, exposed to the sunshine. They frequently feed in compact flocks of fifty or more. Their fare is ripening seeds and other parts of the plants, particularly of the mustard and radish. Often they hull and discard outer coverings of the seeds.

Linnets are present at Point Lobos throughout the year, but in varying numbers. The linnet population is greatest during the early part of the nesting season, when this is the most numerous species, with the possible exception of the colonial cliff swallow. It is estimated that around the middle of May at least 800 linnet individuals live in the Reserve.

White-crowned Sparrow

This bird is a conspicuous feature of that narrow coastal portion of California typified by Point Lobos. It is predominant in the brushland, and its welfare here requires freedom from disturbance by unnatural changes in this type of habitat.

Approximately 150 pairs are found in the Reserve at the beginning of the nesting season.

All through the year this bird stays in the same general type of habitat—the bush-covered portions of the Reserve. All kinds of bushes are occupied to some extent, but lupines appear to be more suitable than any other. This bird forages a great deal on the ground between, and a short distance out from, the bushes, as well as within their foliage. It returns to the bushes for cover and for lookouts from which it can see approaching dangers. General types of food obtained in these situations vary widely, including as they do the ripened seeds of the plants, the green leaves of plants, and insects. It is especially interesting to watch the scattered flocks forage out over the open ground, yet keeping close to the bushes.

These sparrows sing much during the spring, with a clear, full song, and occasionally they are heard at night, and during the summer.

Raptorial Birds—Hawks, Eagles, Owls

Thirteen species of hawks, eagles, and owls have been observed at Point Lobos. These birds exert steady pressure on the populations of smaller animals and thus they provide the necessary curb to over-population by such creatures. The surest means for keeping the raptors is to maintain, uninvaded by trails, roads, and other human works, certain habitat "reservoirs." Suitable ones occur only in the main area of pine woods and in the vicinity of Whalers Knoll. It seems certain that the visits of golden eagles are due to the presence of these "reservoirs," and of ground squirrels as a food source appropriate to this large bird of prey.

The most conspicuous kind of hawk at Point Lobos is the red-tail. One or two individuals of this species are seen almost every day. In frequency of observation this species ranks about equal to the sparrow hawk, which nests in the Reserve and is also present continuously.

Though the sharp-shinned hawk is not such a frequent visitor to the Reserve, encounters with one by even the casual observer are likely to be remembered. When the hawk makes a dash there is a frantic exodus of small birds from the vicinity, and they are loath to leave cover for some time after a sharp-shinned hawk has been sighted.

Grinnell and Linsdale reported that during their study of the area, one or two or three golden eagles occasionally visited Point Lobos from somewhere off to the east. An encounter between an eagle and two duck hawks was watched in the early afternoon of March 30, 1935. The eagle appeared to be looking for ground squirrels near the parking place by the base of Cypress Point. It flew westward, poising against the wind until it came nearly to a cliff where there were two duck hawks. Then these birds came out and the eagle promptly turned back landward, the falcons diving at it alternately, one or the other screaming constantly. At least three times, as a falcon dashed down at the eagle, the eagle rolled over so as to meet the assault from above, with talons extended upward toward the attacker. It could not be seen that there was actual contact at any moment, but the bluff worked. The eagle was obviously on the defensive and made for the

woods with heavily beating wings between each onslaught, soon disappearing into the woods toward Rat Hill and below the level of the tall tree tops. Only then did the falcons give up the pursuit and fly back to the cliff.

These observers also reported that in the fall for a month beginning on September 21st, from one to three golden eagles were present regularly in the Reserve. They were seen mostly in the vicinity of Whalers Knoll, along the western margin of the pines, and over the open ground west of there. They seemed to be occupied mainly with hunting for ground squirrels. One was seen once on the ground among bushes. Some days these birds were heard calling almost continuously. Apparently when the numbers of ground squirrels above ground were reduced at the beginning of the season of hibernation, the eagles moved off the area, at least for most of their activities.

Duck hawks keep to the seaward sides of Point Lobos and particularly Little Dome and Big Dome. On every occasion that a duck hawk appears over land there is much confusion among the small birds, followed by several minutes of complete silence.

Owls are also steady predators in this Reserve.

The birds here discussed are perhaps the most important to Point Lobos Reserve because of their great numbers, their effects upon the flora and fauna of the area, or their high degree of adaptation to the environmental conditions within the Reserve.

However, many others attract the eye or the ear of visitors with their unusual characteristics or delightful songs.

Juncos in gray coats and slatey-black hoods; brown towhees; flycatchers; jolly thieving crows; Steller jays, with handsome crests and deep-blue plumage; thrashers, with their entrancing love songs; the meadow larks caroling sweet notes; finches; thrushes; the plump quails calling "Who are you? Who are you?"; oyster catchers, and turnstones, running in and out with the waves on the sand and rocks, but being very careful that their legs do not get wet—these are but a few of the more obvious birds to be seen and enjoyed by the visitors.



CHAPTER IX

LIFE BETWEEN THE TIDES *

The intertidal animals of Point Lobos are a fair sample of those which inhabit exposed rocky shores from Central California to Southern Alaska. The point thrusts ledges of hard rock fan-wise into cold turbulent water. Waves rush into narrow coves, dash high, and fall back in numberless cascades. Except on the southern shore, where irregularities of the eroded conglomerate provide shelter from the heaviest surges, there is little chance for the formation of sizable tide pools and, hence, for tide-pool associations at their best. The sides of the granite points are steep and offer almost a maximum resistance to the buffeting and scouring action of great seas, which in winter assail the coast with spectacular force until the ocean is churned to whiteness.

Under such conditions the only life which can survive is that adapted by toughness to withstand shock and by structure to adhere temporarily or permanently. Of course, many creatures are sheltered within rock crevices, between closely crowded mussels, or in masses of kelp such as *Lessonia*.

Along the lower, southern shore of the Point the conglomerate rock is much broken, affording a great variety of exposure, and often complete shelter. At one place there is a small rocky beach uncovered at low tide. Here and on Conglomerate Point will be found a considerable number of small tide pools, the population of which varies with exposure to surf and position above lowest tide level. In general, pools nearest low water and least exposed to wave action contain the greatest variety of forms.

It need hardly be stressed that the time to observe shore animals is during low water and when the Pacific is living up to its name. High tide or high seas are avoided by the old hand. It may be even dangerous on a difficult shore to approach too near the water, owing to the occurrence of sporadic giant waves which greatly overreach the average and constitute a serious peril to inexperienced persons.

Animal life between tides is dominated by the invertebrates—creatures lacking a backbone. Such are the sponges, anemones, worms, mollusks, barnacles, crabs, sea stars, sea urchins, sea squirts, and numerous other less conspicuous types.

On wave-swept exposed rock such as the granite pyramid point three rather conspicuous intertidal zones are readily observable. There is a broad, somewhat bare, splash zone mostly above mean high tide; a broad dark zone of mussels and kelp; and below this a coralline zone exposed at lowest tides and colored pinkish or reddish. On *Protected* shores this lowest zone is very populous.

* By W. K. Fisher, when Director, Hopkins Marine Station, Pacific Grove, California; and James L. Leitch.

◀ Lace-lichens frame the path that leads to many areas frequented by birds of shore and seacoast



Codium fragile (Suring) Hariot. (Chlorophyceae—Green Algae).
W. C. Matthews Photo.



Fucus furcatus Agr. (Melanophyceae—Brown Algae). W. C. Matthews Photo.

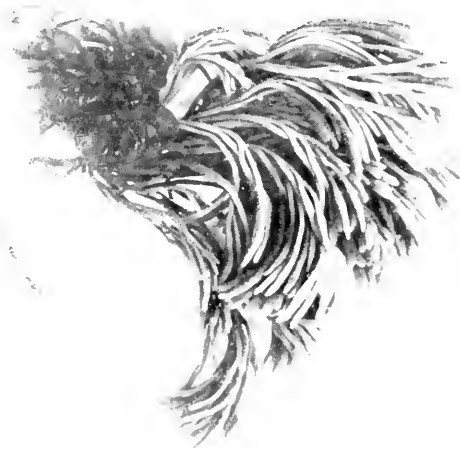
Brown and green algae make up most of the



Egregia Menziesii (Turw.) Aresch.
(Melanophyceae—Brown
Algae).
W. C. Matthews Photo.



Pelvetia fastigiata (J. Ag.) De Toni. (Melanophyceae—
Brown Algae). W. C. Matthews Photo.



Pelvetiopsis limitata f. *typica* Gardner. (Melanophyceae—Brown Algae).
W. C. Matthews Photo.

The middle zone owes much of its characteristic dark color to beds of California mussels, which also cover the tops of some of the rocks off the north shore, submerged at high tide. The lower part of the mussel zone is covered by a dense growth of the tough brown kelp, *Lessonia*.

A hardy barnacle (*Mitella*) grows in clusters among the mussels. Its peduncle or stem is really its head by which it is cemented to rocks, and its gregarious habit affords mutual protection against the pounding or shearing action of waves. Feeding on both of these animals, the common sea star finds the roughest coast a congenial habitat. Impact by heavy seas makes no impression. It clings like a limpet by means of its hundreds of sucker feet. It is purple, brown, or yellow in color.

The closely crowded mussels are attached to the rocks by tough horny threads which are spun by the long, protusible, finger-like foot. The broadened end of the mussel is turned outward and receives the impact of waves, but between the inner tapered ends there are little galleries filled with relatively quiet water; just as a strong wind passing over a thick forest does not greatly disturb the quietness near the ground. In these irregular arcade-like spaces live a multitude of worms: Various unsegmented flatworms; rubber-like, soft, striped nemerteans; green nereids, of many segments, armed with jaws and remotely resembling centipedes; *Halosydna* with two rows of scales along the back; sipunculids, sometimes called "peanut worms," a misnomer. A great variety of small crustaceans, isopods, amphipods, small crabs and shrimps are regular denizens of the mussel beds, as are also small mollusks.

In and around the mussel zone are found sea cradles (*Nuttallina* and *Katherina*), limpets, reddish volcano barnacles, rock barnacles; and in any little chance rock pool, greenish sea anemones, hermit crabs, and sometimes small purple sea urchins. In more sheltered nooks or on quiet days the two sorts of shore crabs venture alertly from hiding. They are unbelievably nimble, and *Pachygrapsus* merits the name "Sally Lightfoot" aptly bestowed by West Indians on a near relative of identical habits.

In the uppermost zone, wet only by spray, are dingy little littorine snails crowded in crevices for mutual protection and moisture, small limpets, and (once upon a time) the large owl limpet, too, beloved of Italians and shell collectors.

In this wave-swept area, below the mussel zone, the rocks are often covered with a reddish incrustation, the alga *Lithophyton*. In *protected crevices* are red, yellow, and blue encrusting sponges; delicate feathery growths—the hydroids and bryozoans; soft brown colonial sea squirts; small sea cucumbers, and naked mollusks of high color. Here also are found quite a range of mollusks including the black abalone, key-hole limpets, leafy horn-mouth snail, top shells, short spired purple. Where the rock is not too vertical, purple urchins occur, often in individual "forms" hollowed from the rock. These little basins are excavated by the urchins, which cling tightly with sucker feet and braced spines.

A characteristic feature of the most wave-swept offshore rocks are the miniature groves of sea palms, *Postelsia*, graceful kelps of unbelievable toughness which bend in unison when a surge breaks over them, and then spring upright as the water cascades from among the closely crowded stems. They favor flat-topped rocks and benches at about mid-tide and are annuals—destroyed by winter storms and renewed in the spring.

On *protected rocky shores* many animals of the exposed coast are present, together with a multitude unable to survive the rigors of heavy wave action. Provided there is an ample supply of well-aerated water at or near sea temperature, the more varied the configuration of the shore the greater will be the variety of life. In the most favorable situations on Point Lobos is to be found a fair representation of the intertidal invertebrates of Northern California.

A sheltered, fairly deep, tide pool with its surrounding rocks and cobbles, would house a rather formidable list of animals. One of the first to strike the eye is the giant green sea anemone, very flower-like with its several circles of tentacles, which normally are expanded to trap an unwary crab or sculpin. These sea anemones are not fastidious; any small animal will be engulfed which is not too strong to escape the adhesive tentacles as they slowly fold inward.

There is a nearly related, usually smaller, dull pink species and a rare deep carmine one with larger tentacles, sometimes called sea dahlia. A fourth small species, growing in mats, covers itself with bits of shell and when contracting squirts water from a multitude of pores. It is found usually somewhat higher, in tide position, than the green—which, also, is an animated watering pot. A green anemone 6 to 10 inches in diameter is undoubtedly very old—50 to 100 years—and should be treated with respect.

Belonging in the same great group as the anemones are the exquisite hydroids, delicate miniature trees and bushes flowering in medusa heads. They are white, yellow, orange; others are brownish, as the ostrich feather, *Aglaophenia*.

Often living along side of the green anemone are purple urchins. The much larger maroon, giant urchins, with longer spines, are inhabitants of the deepest pools and commonest offshore. The young of the purple urchin are green and usually hide under stones or in crevices. Both feed on kelp. In shallow pools the purple covers itself with bits of shell and kelp, held by the multitude of sucker feet.

The common sea star found on mussel beds is equally at home in quiet tide pools. Its name, *Pisaster ochraceus*, is rather misleading, as it is more often brown or dull purple than yellow. It is a voracious predator, but is too sluggish to capture anything unattached—hence its predilection for mussels, barnacles, and limpets. The twenty-rayed star when excited by food can move rapidly and execute counter movements actively. When under “full sail” with its thousands of tube feet lashing back and forth it is an impressive animal. Its numerous cushions of probably millions of microscopic pincers and the wide expanse of its flexible body make it a formidable predator. By preference it eats both species of sea urchins, which are swallowed, spines and all. After 24 to 36 hours, the cleaned test and spines are ejected through the mouth. A large example, two feet in diameter with 20 to 23 rays has about 15,000 tube feet, all perfectly coordinated so that the star can crawl with any ray foremost. It has a wide range of color: purplish gray, dull furry gray, orange, reddish.

Two kinds of six-rayed starlets, upward of $2\frac{1}{2}$ inches in diameter, are found under rocks and are notable for brooding their developing eggs and tiny young. A temporary brood-chamber is formed around the mouth by arching the disk and approximating the bases of the rays. An arctic relative swallows its eggs and the young develop in the stomach. The small

blood star, *Henricia*, is also found under stones. It has five rays and incubates its young.

In the short-rayed star (*Patiria*) the body is sometimes rather thick and inflated, sometimes depressed, without sharp distinction between disk and rays, which may be also 4, 6, or 7 instead of the prevalent 5. The color is yellow below; bright red, dark red, purple, straw-color, blue gray, greenish gray above, or sometimes a mosaic of all of them.

Among the crabs and crab-like animals of tide pools and the intertidal zone are two shore crabs, *Pachygrapsus* and *Hemigrapsus* with squarish shells, which are agile scavengers often hiding by day under stones or in crevices. The first has usually a dark green shell, the second a purplish one, the claws spotted with purple. Under stones will be found the flattened brown, active *Petrolisthes* with long antennae; and in deeper parts of a pool any of several very sluggish spider crabs, often overgrown with sponges and hydroids. Of the "edible crabs," *Cancer productus* is most likely to be found. It is striped in youth but dark red when adult.

Hermit crabs, inhabiting empty mollusk shells, are the clowns of any tide pool. They are active, pugnacious, inquisitive. The commonest has blue tips to the legs, and often lives in turban shells. A large relative of the garden sow bug will be found well above water, foraging on rocks or in crevices. This is the isopod *Ligyda occidentalis*, its gait unpleasantly reminiscent of the cockroach. On kelps, under stones, and in sand are numerous other isopods, some very small. Among the true shrimps the most amazing is the pistol shrimp which dwells among sponges, kelps, and surf grass, often in very definite tunnels. The thumb of the large mitten-like claw is adapted to snap against the palm. This is the origin of the snapping noises sometimes heard at low tide.

The most conspicuous of the legion of mollusks is the black abalone found in crannies near low tide mark. It is greenish black on the outside, smooth except for the lines of growth, has 5 to 9 holes and is markedly convex. It is in fact a sort of limpet with multiple keyholes. With the Park's protection, the black abalone is again becoming plentiful at the Point. The red abalone, a larger species, is not common, although during heavy winter storms they are sometimes dislodged and cast ashore.

True limpets are common. On Conglomerate Point the plate, shield, dingy, rough, and file limpets are found. Shells of the white cap, pure white and conical, are often washed up on the beach. The animals dwell under rocks. Above the limpets in the spray zone are the littorines, already noted.

In the tide pools the commonest sea snails are the black and brown turbans, upward of an inch and a half high, usually aggregated in cracks of the rocks. On the turbans will often be found adhering the slipper shell, *Crepidula*. The blue top, *Calliostoma*, is sometimes common. More colorful however are the slugs, or nudibrachs, which are devoid of shell and vary greatly in size and tint. One of the showiest is the yellow to orange sea lemon, *Anisodoris*, likely to be found among laminarian kelps; *Triopha* shows orange marking against white; while the small *Hopkinsia* is bright rose. Some of the small aeolid nudibrachs, under a magnifier, are among the most beautiful of all animals.

The chitons (*ki-tons*) or "sea cradles" have the habits of limpets, but instead of a single shell they have eight separate shells, each one perfectly articulated to the next, like a coat of mail. They cling tenaciously to rocks,

but are found in a great variety of places. *Katherina* and *Nuttallina* live on more or less exposed surfaces; the strikingly beautiful lined chiton on more sheltered ones. Many remain attached to the under side of stones, as the blue and gray chitons, foraging at night. While some chitons are less than half an inch long when adult, the giant chiton, dark red in color, may attain a foot or even more. It is found among kelps in the deepest pools and the shell is completely hidden by a tough plush-like skin. The chitons feed on minute plants and kelps rasped into the mouth by the file-like tongue.

Although worms are legion, they are not likely to engage the attention, except the feather duster which lives in a tough, parchment-like tube which adheres to the rocks. The color of the feathery gills is purple, wine color, tawny or whitish. Small serpulids with brilliant red feathery gills and twisted lime tubes are frequently very numerous. Predaceous crawlers are hidden in sponges, mussel beds, sand, rock crannies, coming out mostly at night. Ribbon worms swallow segmented worms and the latter devour smaller worms and crustacea. The giant *Nereis* which reaches a length of three feet has not been taken on the Point but undoubtedly occurs hidden within deep burrows, among loose rock.

The foregoing is but a sketchy picture of Point Lobos intertidal life, touching only a few of the more colorful bits of a surprisingly rich detail. Point Lobos has a heritage which should be carefully preserved for the benefit of those who love the sea and for the student to study in undisturbed conditions. There are few regions of the world with a better endowment of natural resources.

For those who seriously desire to become acquainted with the principal types of animal life there are available two excellent books: *Between Pacific Tides* by E. F. Ricketts and Jack Calvin, and *Seashore Animals of the Pacific Coast* by M. E. Johnson and H. J. Snook.

CHAPTER X

HISTORY AT POINT LOBOS *

Centuries ago—back, perhaps, a thousand years or more—Point Lobos was occupied by Indians. Though archaeological remains are somewhat scanty (mainly shell deposits and bedrock mortars), the evidence shows that the Point was often visited by the aborigines and that more or less permanent settlements were established near the mouths of San Jose Creek and of Gibson Creek, the only places in this vicinity where fresh water was available. Definite Indian mounds are at these two sites, which were obviously of a more permanent character than the other shell areas within the park. They were at least spring and summer residences of groups which probably had winter villages somewhere inland, in more sheltered valleys. So far as known, there are no aboriginal hut rings, burial grounds, or petroglyphs in the park area.

Temporary or "intermittent" camp sites of Indians are found at 19 places along the six miles of shore line. Most of these appear to have been little more than overnight fishing stations, which were revisited year after year by Indians from the interior, to gather harvests of abalones, mussels and other mollusks. There are five localities on the point where mortar holes for grinding seeds and acorns—probably of the coast live oak—occur in association with the shell deposits.

From examination of the mounds, shell deposits and other remains, it seems not unlikely that many of these were several centuries old when Europeans first reached the California coast. It is not definitely known whether the Indians were more closely related to those of the San Francisco Bay region, or to the Channel Islanders, or whether they formed a distinctive group with the adjacent mainland peoples.

Knowledge of the ancient habitation of this area has been greatly increased by an *Archaeological Reconnaissance of Point Lobos Reserve*, written by Waldo R. Wedel, formerly Research Assistant in Anthropology, University of California, Berkeley.

Early explorers saw Point Lobos from the sea. Though many details of their voyages are obscure, and are in dispute, it is probable that Cabrillo and Ferrelo viewed this headland in 1542. It is certain that Sebastian Viscaíno passed close by several times, in 1602-3. When his ships entered Carmel Bay, some of the Spaniards encamped near the mouth of *Rio del Carmelo*, which Viscaíno named in honor of three Carmelite friars who accompanied him. Possibly the commander, or at least some of his men, actually set foot upon Point Lobos.

The exploring party of Don Gaspar de Portolá marched by here in October, 1769; and Sergeant José Francisco Ortega, the "pathfinder" of the expedition, made a careful study of the coastline south of Carmel River. For a time Portolá's men were camped upon the banks of San Jose Creek, and his livestock grazed upon the lush grasses there.

* By Aubrey Drury, Secretary, Point Lobos Association (1927-1933); President, California Historical Society (1949-1951); and Vernon Aubrey Neasham, Regional Historian, National Park Service, 1938-1952; Historian, California Division of Beaches and Parks, 1953.

In 1771 Mission San Carlos (Carmel Mission) was established near Carmel River, with Point Lobos in view to the southwest. Padre Junípero Serra, who was a great walker, doubtless visited the Point many times.

The native vaqueros of Carmel Mission ran large herds of cattle in the Point Lobos area from an early date, and the padres claimed the land on behalf of their Indians. Cattle grazing was the first real use made by the Spaniards of this region. Old records tell of the Mission herders lassoing bears upon the banks of San Jose Creek, while driving their cattle.

It is likely that the name Point Lobos (*Lobos Marinos*, sea lions) was given in Spanish times.

After 1833, when the Missions of California began to go through the process of secularization—that is, when their lands were thrown open to ownership and settlement by private citizens—properties which had been under the control of Carmel Mission went through the same process as the others. Juan B. Alvarado was given a grant on September 30, 1834, which may have included a portion of the lands in the vicinity of Point Lobos. When Teodoro Gonzales, on September 2, 1835, applied for the rancho of Sur Chiquito, the map which he submitted shows that the grant for which he applied definitely included Point Lobos.

The grant which remained valid, however, was that given to Don Marcelino Escobar, a prominent official of Monterey, on April 16, 1839. This baronial domain of the Rancho San Jose y Sur Chiquito, consisting roughly of two leagues, was bounded on the north by the Carmel River, on the east by the mountains, on the south by Palo Colorado Canyon, and on the west by the Pacific Ocean. From this grant, which was confirmed in 1840, are traced all chains of title to Point Lobos.

More than 115 years have elapsed since the original grant was made by the Mexican Government in 1839. Since that time, until the State secured ownership, scores of claimants tried to prove the legitimacy of their claims. The record of litigation, as traced by historic researchers, is both complex and confusing.

Two of Don Marcelino's sons, Juan and Augustin, seem to have obtained possession of the rancho shortly after the grant to their father. However that may have been, they deeded it to Doña Josefa de Abrego on August 26, 1841. That señora, holding power of attorney from her husband to buy and sell land, paid two hundred and fifty dollars, one-half in silver and one-half in merchandise, for the rancho.

The next step in the process of conveyance remains somewhat of a mystery—at least the deeding of the rancho to a group of soldiers of the Monterey presidio on January 16, 1843, by Doña Josefa. It seems that they paid nothing for it, and yet the records leave no doubt that she deeded it to them. There is a legend of a gambler losing the rancho at cards. Is this where the story comes in? Did Doña Josefa, acting in the power of attorney for her husband, Don Jose de Abrego, turn the property over to the soldiers in payment of her husband's gambling debts to them? That story has been told of Don Marcelino, but, if holding a half-truth, it would appear that it was Don Jose who gambled and lost a rancho and not Don Marcelino.

The soldiers of the presidio, about 10 in number, held the land in their names until June 7, 1844, when they turned it over to their superior officer, Colonel Jose Castro, prominent in the annals of California history for his opposition to the American invasion. As late as 1848, Castro was given quitclaim deeds by the soldiers concerned.

All this time, during the Mexican period, it is certain that cattle raising was carried on in the Point Lobos area. Escobar's grant, in 1839, specifically mentions cattle grazing.

The annexation of California by the United States, in 1848, resulted in the setting up of a land commission to review all private claims in California. Thus it was that Jose Castro filed his petition as claimant to the Rancho San Jose y Sur Chiquito on February 2, 1853. The Board of Land Commissioners rendered a decree rejecting Castro's claim on August 28, 1855, thereby rendering invalid, seemingly, the original claim of 1839. Castro's claim was appealed to the United States District Court, where it remained for years in doubt.

Almost a year before the rejection of the Castro claim by the United States Land Commission, General Castro sold his claim to Joseph S. Emery and Abner Bassett for \$750. It was they who were to carry on the fight for the rancho. Before the final decision of the court, Bassett died, in 1874, leaving his estate to his wife and eight children. The undivided one-half of the 8,818.56-acre Rancho San Jose y Sur Chiquito, claimed by Bassett's heirs, was appraised at \$15,000.

Thus far, the title claim to the Escobar grant is simple and can be followed without much difficulty. Other claims were put forward at an early date, however, which bade fair to entangle the Castro claim in an impossible maze. Conflicting deeds and squatters' rights all came into the picture.

The earliest conflicting claim was that of the Escobar heirs. Only two of the children, Juan and Augustin, had deeded the rancho to Doña Josefa de Abrego in 1841. There were other sons and daughters, and later grandchildren, who claimed a portion of Don Marcelino's grant. Those heirs agreed, on March 25, 1859, to give to one Delos R. Ashley, an attorney, one-half of the rancho if he would get it back for them. Later, in 1860 and 1861, these same heirs sold a portion of what they claimed to Mathew G. Ireland, who had on March 12, 1859, bought a quit claim deed from the Abrego family. December 1, 1877, found one-ninth of the rancho "sold" by the Escobar heirs to Adam Joseph Kopsch. In addition to the above claims, a Sidney S. Johnson claimed that Emery and Bassett had agreed earlier to give him one-third of the rancho. The squatters' claims were almost too numerous to mention.

Thus, by 1880, when a suit was filed in the United States District Court to settle the respective claims, the following claimed the land: Joseph S. Emery, one-half; the Bassett Estate, one-half; Sidney S. Johnson, one-third; W. Van Dyke, the successor of Kopsch, one-ninth; the heirs of D. R. Ashley, one-fourth; W. T. Baggett, who had bought one-half of the Ashley interest, one-fourth; and Joseph W. Gregg, who had bought the Ireland claim of about 1,000 acres north of San Jose Creek.

The final agreement, recorded on June 5, 1882, which was subject to the confirmation of the Castro claim by the United States, found the claimants receiving the following percentages: Ashley heirs, one-ninth; W. T. Baggett, one-ninth; J. S. Emery, two-ninths; Bassett Estate, two-ninths; Sidney S. Johnson, two-ninths; and W. Van Dyke, one-ninth. Gregg's claim to the land north of San Jose Creek was later recognized, as were the claims of some 27 others, mostly squatters.

An agreement had been reached, then, between those who claimed portions of the Rancho San Jose y Sur Chiquito. Only the confirmation of the Castro claim remained in the way of those claimants having the portions which they claimed. As yet, with the exception of Gregg and the squatters, there seemed to be only undivided interests.

The Castro appeal was finally won, in 1882, in the case of "*The United States of America versus Joseph S. Emery, Nathan W. Spaulding, with the will annexed of Abner Bassett, as successors in the interest of Jose Castro, deceased, the claimant herein.*" The title was confirmed on December 24, 1885, and the patent was signed by President Grover Cleveland on May 4, 1888.

During much of this period of litigation, Point Lobos was a center of a picturesque maritime industry. Carmelito Cove, though small, offered a base of operations for whaling, which began there in 1861 or 1862. Some 20 Portuguese used the cove as their base. Whalers Knoll, above the old quarry, was used to sight the whales. When captured and killed, a whale was brought to the derricks and tackles in the cove, where it was cut up in the water. Iron caldrons set in stone were used in boiling the whale oil. The lurid flames and smoke of the quays, the shrilling of seagulls, the shouting of men, and all the attendant excitement were in marked contrast to the peaceful locale—the small frame cottages of the whalers; the pigs and goats and cows browsing roundabout, and the neat little gardens, which were planted mostly to corn and pumpkins. Today, all that remains of the whaling industry, which was abandoned about 1884, is the hulk of one of the whale boats, the derrick rings in one of the rocks, a 90-foot whale skeleton, two of the iron caldrons, one of the whalers' cottages, some evidence of old oil spilled upon the ground, and a stone wall used as protection from the wind upon the lookout knoll.

Shortly after the signing of the patent pertaining to Rancho San Jose y Sur Chiquito, by President Cleveland, those who claimed the rancho, with the exception of Gregg and the squatters, banded together and on September 6, 1888, sold their interests to the Carmelo Land and Coal Company, a corporation, for the sum of \$1. They, of course, held shares in the company equivalent to their interests in the land. Thus, for the first time in almost half a century, the Rancho San Jose y Sur Chiquito, including Point Lobos, came under one ownership.

In the early 1880's it was determined that the hills back of the Point contained coal deposits, considered valuable. The forming of the Carmelo Land and Coal Company in 1888, by the owners of the Rancho San Jose y Sur Chiquito, marked the beginning of an extensive development. A railroad already had been built, which connected the mine with the county road, and a coal chute was added by which the coal could be transferred from the road to the north side of Carmelo Cove. The annual report of the State Mineralogist in 1890 tells us that more than 720 feet of the coal mine tunnel had been retimbered, and that the coal in three distinct veins varied in thickness from two to nine feet. A hoisting engine, built at the cost of \$10,000, was to be used in bringing the coal to the surface. Chinese laborers were employed to do the actual coal mining.

Because of the expense of operation, and market conditions, the coal mine was idle by 1896, and has remained so, for the most part, to the present day.

Another type of mining at Point Lobos was the quarrying of granite. The old quarry remains as evidence that a great amount of rock was taken out. The old United States Mint in San Francisco and the jail at Colton Hall, Monterey, were built from Point Lobos granite, according to the oldtimers.

A little prospecting and mining for gold at Point Lobos caused a flurry now and then. As early as 1863, the San Carlos Gold Mining Company was incorporated by prominent citizens with capital stock of \$50,000 to develop gold properties there, but it was not successful. In 1907, prospectors were given legal permission to enter Point Lobos and explore for mineral wealth. That was the last recorded attempt at such exploitation.

The silver treasures of the sea had more significance. It has been mentioned that the Indians fished at Point Lobos. Later explorers also fished there. Chinese, among them some who mined for coal, went to Point Lobos to fish. The United States Surveyor General's 1885 map of the Rancho San Jose y Sur Chiquito shows several Chinese fishermen's huts near the beach of Carmelo Cove, as well as one just south of the present Reserve boundary.

Japanese fishermen were brought to Point Lobos later, in the 1890's, to help develop an abalone canning industry here. Using long hooks and nets, the Japanese at first fished mainly near the shore in water not more than 10 feet deep. Later, diving suits were used, both from the shore and from boats in deeper water.

The abalone cannery was established upon the site of the old whaling station, near the foot of the quarry cliffs. Heaps of abalone shells, brilliant in their varied colors, remain today as reminders that many cases of canned abalone must have been shipped to the Orient, for that is where most of them found their way. The packing of abalone here came to an end in 1928. Cannery buildings which remained were torn down by the state authorities, after acquisition of the Reserve, to restore conditions as they had been.

Other advantages of the region received attention. The coal company subdivided part of Point Lobos in 1890-91, when an attempt was made to establish a residential and resort community known as Point Lobos City, and later as Carmelito, fronting Carmelo Cove, with 25-foot and 50-foot lots. Mrs. Robert Louis Stevenson was the owner of one of these and her sister, Mrs. Sanchez, was also an owner here. Quite a number of lots were sold, but the projected village did not become a reality. Fortunately, Carmelito remained a ghost town. A rigid gridiron pattern of streets was laid out, as shown by the revised plat of the town filed on May 29, 1891. The main street was called Bassett Avenue, and other streets bore the names of Emery, Doble, and Baggett. In the map filed, a reservation marked Point Lobos Park was indicated on the outmost cypress point.

In 1896, Joseph Emery met A. M. Allan in Oakland, and interested him in Point Lobos. Allan possessed considerable practical knowledge of coal mining, and that was a factor which brought him here. He purchased the properties of the coal company in the Point Lobos area, including about 640 acres, on January 14, 1898.

Allan held the land in his name (which appears in the records both as *Allan* and *Allen*) after a series of suits with various parties, including members of the Carmelo Land and Coal Company and the Monterey

County supervisors. Most of the lots of Carmelito (but not all) were purchased by Allan.

Allan, who made his home at his ranch house at Point Lobos from 1897 until his death in 1930 at the age of 70, was born in Pennsylvania. His first job, when 12 years old, was as a mule driver in a Pennsylvania coal mine. He worked for an education, and was graduated from the University of Illinois in 1884. Later he became a race track architect and constructor. In some of this activity he was associated with Lucky Baldwin, notably in building the early Santa Anita track. Allan came to California to build the Ingleside track and he also constructed tracks at Tanforan and Emeryville, in the San Francisco Bay region, and Ascot Park, Los Angeles. He was an elder in the Presbyterian Church. Besides managing his holdings here, Allan was a banker and head of a fish canning company.

During the Allan regime, dairying and a limited amount of farming were part of the economic background of the Point Lobos area. Across the road from the Reserve there stands a dairy operated by Allan heirs. Fruit trees remain about some of the old houses. Lumbering, on a very small scale, had some part in the activities of the neighborhood. Gibson Creek, forming the south boundary of the Reserve, gets its name from a Mr. Gibson, who hauled redwood posts out of that canyon, above the part now in state ownership.

As Carmelito Cove offers deep water and is the only good landing place for several miles along the rugged coast (it had been reputed the haunt of smugglers in old Spanish times), rum runners, during the prohibition era of the twentieth century, made some use of that cove and even built a road to facilitate their landings of contraband cargo. Below the quarry are the remains of one of the rum-running boats, silent witness to the prowess of the United States Coast Guard.

Under the Allan ownership, Point Lobos was maintained intact, without further subdivision. Visitors had resorted to the Point for outings even as early as the Mexican regime; and now they came in increasing numbers to see the famous cypress trees and the scenic shore. A toll-gate was established, carriages and automobiles paying toll for admission. Care of the cypress trees became a primary concern of the owners. Artists and scientists resorted to the Point, as did thousands of other lovers of nature. With the development of motion-pictures, a number of producing companies came here "on location"—the first in 1916.

The proposal that Point Lobos should be made a public reserve was broached at the time Carmelito was laid out. The subdividers, as has been noted, marked the outer cypress-crowned headland *Point Lobos Park*. Later it was declared by some that this property had been given to the public at that time—1891.

Dr. David Starr Jordan, in an official report of 1880, informed the Government that the Carmel Bay area, including Point Lobos, was in his opinion the most picturesque spot on the Pacific Coast. Early in the present century a meeting was held in the little museum at Pacific Grove, with a number of scientists and Sierra Club members present, and the preservation of Point Lobos and Cypress Point as national parks or reserves was discussed.

In August, 1909, G. Frederick Schwarz, noted forester who had made a study of the Monterey cypress groves, wrote to A. M. Allan suggesting, "You might perhaps see your way clear to add your beautiful cypress

holdings at Point Lobos to those at Pescadero Point, if the latter were established as a State Park."

Impetus was given the discussion of a park here when, in 1919, the Carmel-San Simeon highway was started, and increasing travel came this way.

There grew out of the Save-the-Redwoods movement a state-wide park program for California. This was developed from a meeting in San Francisco, January 5, 1925, at which time Point Lobos was prominently mentioned as an area which should be included in a State Park System. The Save-the-Redwoods League had several times definitely considered the possibility of preserving a representative grove of Monterey cypress, as at Point Lobos.

A meeting of members of the league and other citizens was held in the Palace Hotel, San Francisco, on December 9, 1926, to advance the acquisition of Point Lobos as a public reserve. As a result of this meeting, Duncan McDuffie, on behalf of the group, later in December, engaged Frederick Law Olmsted, internationally known landscape architect, to make an investigation and report as to the areas most worthy of preservation. The report rendered on April 15, 1927, formed the basis of future plans.

In his official report on the establishment of state parks in California (the State Park Survey), published in 1928, Frederick Law Olmsted declared the Point Lobos project to be of primary importance, terming the point "the most outstanding example on the coast of California of picturesque rock and surf scenery in combination with unique vegetation, including typical Monterey cypress."

The method whereby Point Lobos was acquired by the State was devised by Newton B. Drury, then acquisition officer for the State Division of Parks, and Secretary of the Save-the-Redwoods League. It was developed that, under provisions of the State Park Bond Act, in accord with procedure validated by the Attorney General of California, matching funds were available for purchase of the Point Lobos area. These matching funds from the state park bond issue, to offset a like amount from private sources, were released as a result of the gift of the Prairie Creek Redwoods to the State, through the instrumentality of the Save-the-Redwoods League. It was pointed out that the amount expended from the State Park Bond Issue on the Prairie Creek Redwoods project was less than the one-half stipulated in the State Park Bond Act, so that there remained a "matching credit" which could be applied to the issuance of bonds for the purchase of Point Lobos. The acquisition of the Prairie Creek area was greatly aided by generous gifts from Edward S. Harkness.

On October 19, 1932, the State Park Finance Board authorized issue of state park bonds for the purchase of approximately 400 acres at Point Lobos. Transfer of title to the State was made on February 8, 1933. The amount involved was \$631,000. According to agreement with the Allan family, a portion of the Cypress Headland was to be considered a gift, and dedicated as a memorial to A. M. Allan, and his wife, Satie Morgan Allan.

It was recognized that the acquisition of Point Lobos as part of the State Park System presented an unusual opportunity for its "preservation and protection as a reserve, accessible to the public in such ways as permit its enjoyment without impairing its excellence—safeguarding for all time its unique inspirational, educational and scientific interest." Such was the

program of the Point Lobos Association, which from 1927 to 1933, under the leadership of Mrs. Robert Hunter, devoted study to means of conservation.

Carrying on this program, the organization meeting of the Advisory Committee on Protection and Use of Point Lobos (a committee of the Save-the-Redwoods League) was held on November 29, 1933, at the Custodian's Lodge, Point Lobos.

A master plan for Point Lobos Reserve, developed over a number of years, was adopted by the State Park Commission, of which William E. Colby then was chairman.

Among the values to which due attention has been given are those of the human interest which inheres in this area because of its historic background. Not only is this preserved in place names and in local associations, but also in a number of unobtrusive reminders that the uses of Point Lobos and the adjacent area have been varied. But, fortunately, the economic development, definitely terminated many years ago, was never intensive, and pertained principally to picturesque industries such as whaling, fishing and herding which affected the aspect of the countryside very little indeed. As most of the economic activities were concentrated in one place, Carmelo Cove, the woods and meadows of Point Lobos have remained much as they always were, though enriched with tradition and historic interest.

APPENDIX

I

SCIENTIFIC NOTES ON THE MONTEREY CYPRESS *

Cupressus macrocarpa Hartweg (Monterey cypress). Littoral tree, 15 to 80 feet high with trunk 1 to 3 feet in diameter, the branches spreading and forming a regular conical crown or exceedingly distorted and irregular; ultimate branchlets numerous, fine and subterate, densely clothed with triangular scale-like leaves; leaves $\frac{1}{2}$ to $1\frac{1}{2}$ inches long; staminate catkins ovate or subglobose, 1 to 2 lines long, borne at the ends of the ultimate branchlets; ovalate catkins greenish, composed of about 5 pairs of broadly ovate thinnish scales; cones dull brown, broadly oblong or subglobose, 1 to $1\frac{3}{4}$ inches long; scales flat-topped, with a central curved thin-edged ridge-like umbo; seeds 1 to 2 lines long, narrowly wing-margined but irregularly shaped from crowding in the cones and with a minute, white, lanceolate attachment scar at base.

The Monterey cypress inhabits the ocean shore and forms two groves, one at Cypress Point near Monterey and the second at Point Lobos. It is the most restricted in distribution of any California tree and of any coniferous species in the world. The wind-broken and most admired individuals stand in exposed places on the bluffs or cling to the very face of the rocky cliffs within reach of the flying ocean spray. In such situations they are carved into picturesque and oft-times singular shapes remarkable for the density of the masses of foliage presented towards the ocean and the flattened or board-like character of the supporting trunks. A little back from the shore, where the trees protect each other, they assume regular forms, as regular as those of trees in cultivated plantations. Most of these protected trees have very open crowns and finger-pointed main branches.

The effect of the wind upon the trees growing in exposed situations is by reason of their moist habitat due less to effect of excessive transpiration than to mechanical strain. One may see two trees standing side by side of equal height and equally exposed, one a young tree with slender, pointed, symmetrically pyramidal crown, the other an old tree, its trunk shorn of branches and rising to a battered but thick flat-topped crown.

Unsymmetrical trees, whose configuration is due in the main to wind, fall roughly into three types:

1. Trees possessing much thickened lower branches and irregular crowns.
2. Trunks, mainly dismantled of branches, ending above in a flat hat-like crown of compactly woven branchlets.
3. Trees crouching together in small companies and building up to leeward an even, dense wall of foliage.

As a result of wind strain on top, or load of one-sided crown, trunks often become heavily buttressed or swollen unsymmetrically at base. Excessively buttressed trees usually stand in the most exposed places. On the other hand, trees standing equally near the shore line exhibit trunks not buttressed. Buttressing is also more or less correlated with root development.

* An abridged extract from "The Silva of California"—Willis L. Jepson, Pages 155 to 158. (Berkeley: The University Press, 1910.)

In cultivation the Monterey cypress has long been a favorite shelter and hedge plant in California and is easily propagated by seed which is readily germinated within two or three weeks in open-air nursery beds. Each cone produces about 150 seeds. The seedlings grow with weed-like rapidity. Practically all cypress hedges in California are of this species. It lends itself to the art of the formal gardener, by whom it is almost always clipped into regular forms or even into most fantastic figures. It is a successful windbreak and is much used for that purpose since it will grow an erect body in places where the wind promptly controls other species. As an ornamental tree it has also been widely planted, but has comparatively little to recommend it save its rapid growth and dense crown.

The present exceedingly limited area of its natural home must have been caused by change in climatic conditions, since the tree itself is vigorous and readily adapts itself to cultivation in many parts of the world. Its seeds are light and easily dispersed; they germinate promptly under favorable conditions; the seedlings grow rapidly and show vigor. Nevertheless this species could never extend itself over the dry Coast Range hills unaided. Grown in the interior their constitutional vigor seems weakened by the dryness of the hot valleys and they succumb to the attacks of borers.

The age of Monterey cypress in the native groves is not readily determinable since the trees, on account of their rarity and interest, are not cut either for fuel or lumber. One fallen tree sawn through to remove it from a roadway was 98 years old and had a trunk two feet in diameter. Since the tree grows rapidly it would seem fair to hazard the opinion that 200 to 300 years represents the extreme age of the older trees. The advertisement of them in seaside literature as 1,000 to 2,000 years old does not, as far as the writer is able to determine, rest upon any actual data, and probably represents a desire to minister to a popular craving for bigness and extremes.

Hartweg found *Cupressus macrocarpa* near Carmel in 1846 and on his specimens the species was founded. Seed, however, was collected at an earlier date and sent to England, the seedling trees being called *Cupressus lambertiana*. For nearly a century the Monterey cypress has been planted in England and various parts of Europe, and has also been carried to Australia and southern South America. In New Zealand it is widely planted as a shelter plant, but, as in California, it is short-lived except on deep soil near the coast.

In horticulture a number of color, leaf and branch forms have been developed; in one (var. *lutes*) the tips of the branches are light yellow or golden, changing to green in the second year; in another (var. *Crippsii*) the leaves are spreading instead of appressed with the tips of the youngest growth light yellow; in a third (var. *lambertiana*) the habit is spreading. The var. *farallonensis* Masters is perhaps a cultural form whose origin is unknown. It certainly could not have been derived from the barren, rocky Farallon Islands, as stated by Dr. Masters.

The wood is heavy, hard, strong, and close-grained, the basal parts of the trunks in particular furnishing highly ornamental patterns.

II

PLANTS OF POINT LOBOS RESERVE †

Scientific name	Common name	Family
<i>Abronia latifolia</i> Esch.	Yellow Sand Verbena	Nyctaginaceae
<i>Abronia umbellata</i> Lam.	Common Sand Verbena	Nyctaginaceae
<i>Achillea millefolium</i> L.	Yarrow	Compositae
<i>Agoseris apargioides</i> Greene	Sand-hill Dandelion	Compositae
<i>Agrostis diegocensis</i> Vasey	Thingrass	Gramineae
<i>Agrostis exarata</i> Trin.	Spike Redtop	Gramineae
<i>Agrostis hallii</i> Vasey		Gramineae
<i>Aira caryophylla</i> L.	Hair-grass	Gramineae
<i>Alchemilla arvensis</i> * (L.) Scop.	Lady's Mantle	Rosaceae
<i>Allocarya chorisiana</i> (Cham.) Greene var. <i>myriantha</i> (Greene) Jepson		Boraginaceae
<i>Amsinckia intermedia</i> F. & M.	Fiddle-neck	Boraginaceae
<i>Anagallis arvensis</i> * L.	Poor Man's Weather Glass	Primulaceae
<i>Anagallis arvensis</i> * L. var. <i>coerulea</i> Ledeb.		Primulaceae
<i>Anthemis cotula</i> * L.	Mayweed	Compositae
<i>Apiastrum angustifolium</i> Nutt.		Umbelliferae
<i>Arabis glabra</i> (L.) Bernh.	Tower Mustard	Cruciferae
<i>Arceuthobium campylopodium</i> Engelm.	Pine Mistletoe	Loranthaceae
<i>Artemisia californica</i> Less.	California Sagebrush	Compositae
<i>Artemisia pycnocephal</i> DC.		Compositae
<i>Artemisia vulgaris</i> L. var. <i>heterophylla</i> (Nutt.) Jeps.	California Mugwort	Compositae
<i>Aster chilensis</i> Nees	Common Aster	Compositae
<i>Aster radulinus</i> Gray	Broad-leaf Aster	Compositae
<i>Astragalus menziesii</i> Gray	Rattle-weed	Compositae
<i>Atriplex californica</i> Moq.	Seaside Saltbush	Chenopodiaceae
<i>Atriplex leucophylla</i> Dietr.		Chenopodiaceae
<i>Avena fatua</i> * L.	Wild Oat	Gramineae
<i>Baccharis douglasii</i> DC.	False Everlasting	Compositae
<i>Baccharis pilularis</i> DC.	Coyote Brush	Compositae
<i>Baeria hirsutula</i> Greene		Compositae
<i>Baeria uliginosa</i> (Nutt.) Gray		Compositae
<i>Bowlesia lobata</i> R. & P.		Umbelliferae
<i>Brassica arvensis</i> * (L.) B.S.P.	Charlock	Cruciferae
<i>Brassica campestris</i> * L.	Common Yellow Mustard	Cruciferae
<i>Briza minor</i> * L.	Quaking Grass	Gramineae
<i>Brodiaea capitata</i> Benth.	Blue-Dicks	Liliaceae
<i>Brodiaea hyacinthina</i> (Linel.) Baker	White Brodiaea	Liliaceae
<i>Brodiaea irioides</i> (Ait. f.) Wats.	Golden Brodiaea	Liliaceae
<i>Brodiaea terrestris</i> Kell.		Liliaceae
<i>Bromus carinatus</i> H. & A.	California Brome Grass	Gramineae
<i>Bromus hordeaceus</i> * L.	Soft Cheat	Gramineae
<i>Bromus rigidus</i> * Roth.	Ripgut-grass	Gramineae
<i>Bromus sterilis</i> * L.		Gramineae
<i>Calandrinia caulescens</i> H. B. K.	Red Maids	Portulacaceae
<i>Callitriche marginata</i> Torr.		Callitrichaceae
<i>Calochortus albus</i> Dougl.	White Globe Lily	Liliaceae
<i>Calochortus uniflorus</i> H. & A.		Liliaceae
<i>Capsella bursa-pastoris</i> (L.) Moench.	Shepherd's Purse	Cruciferae
<i>Cardamine oligosperma</i> Nutt.	Bitter-cress	Cruciferae
<i>Carex montereyensis</i> Mke.	Monterey Sedge	Cyperaceae
<i>Castilleja latifolia</i> H. & A.	Seaside Painted-Cup	Scrophulariaceae
<i>Castilleja parvifolia</i> Bong. var. <i>douglasii</i> Jepson	Indian Paintbrush	Scrophulariaceae
<i>Ceanothus thyrsiflorus</i> Esch.	Blue Blossom	Rhamnaceae
<i>Ceanothus thyrsiflorus</i> Esch. var. <i>griseus</i> Trel.	Blue Blossom	Rhamnaceae
<i>Centaurea melitensis</i> * L.	Napa Thistle	Compositae
<i>Centaureum exaltatum</i> (Griseb.) Wight. var. <i>davyi</i> Jepson	Canchalagua	Gentianaceae
<i>Centunculus minimus</i> L.	Chaffweed	Primulaceae
<i>Cerastium viscosum</i> * L.	Mouse-ear Chickweed	Caryophyllaceae
<i>Chenopodium album</i> * L.	White Pigweed	Chenopodiaceae
<i>Chenopodium californicum</i> Wats.	Soap Plant	Chenopodiaceae
<i>Chenopodium rubrum</i> * L.	Red Goosefoot	Chenopodiaceae

† By Herbert L. Mason, July 1, 1935.

* Plants not native to the region.

PLANTS OF POINT LOBOS RESERVE—Continued

Scientific name	Common name	Family
<i>Chlorogalum pomeridianum</i> (Ker.) Kunth	Soap Plant	Liliaceae
<i>Collinsia bartsiaefolia</i> Benth.		Scrophulariaceae
<i>Conium maculatum</i> * L.	Poison Hemlock	Umbelliferae
<i>Convolvulus arvensis</i> * L.	Bindweed	Convolvulaceae
<i>Convolvulus occidentalis</i> Gray var. <i>cyclostegius</i> (House) Jepson		Convolvulaceae
<i>Corethrogyne flaginifolia</i> (H. & A.) Nutt.		Compositae
<i>Corethrogyne leucophylla</i> Menzies		Compositae
<i>Cornus californica</i> G. A. Mey.	Creek Dogwood	Cornaceae
<i>Cotula coronopifolia</i> * L.	Brass Buttons	Compositae
<i>Cotyledon casepitosa</i> Haw.		Crassulaceae
<i>Cotyledon farinosa</i> Baker	Bluff Lettuce	Crassulaceae
<i>Cryptantha leiocarpa</i> (F. & M.) Greene	Nievita	Boraginaceae
<i>Cupressus macrocarpa</i> Hartw.	Monterey Cypress	Cupressaceae
<i>Cuscuta californica</i> Choisy	California Dodder	Convolvulaceae
<i>Danthonia americana</i> Scrib.	Oat Grass	Gramineae
<i>Danthonia californica</i> Boland.	Oat Grass	Gramineae
<i>Daucus pusillus</i> Michx.	Rattlesnake Weed	Umbelliferae
<i>Deschampsia holciformis</i> Presl.	California Hair-Grass	Gramineae
<i>Dichondra repens</i> Forst.		Convolvulaceae
<i>Diplacus aurantiacus</i> (Curtis) Jepson	Bush Monkey Flower	Scrophulariaceae
<i>Distichlis spicata</i> (L.) Greene	Salt Grass	Gramineae
<i>Dentaria integrifolia</i> Nutt.	Milk-maids	Cruciferae
<i>Dryopteris arguta</i> (Kaulf.) Watt.	Coastal Wood Fern	Pteridophyta
<i>Echinocystis fabacea</i> Naud.	Common Man-root	Cucurbitaceae
<i>Elymus condensatus</i> Presl.	Giant Rye-grass	Gramineae
<i>Elymus glaucus</i> Buckl.	Western Rye-grass	Gramineae
<i>Elymus triticoides</i> Buckl.	Beardless Rye-grass	Gramineae
<i>Ericameria ericoides</i> (Less.) Jepson	Mock Heather	Compositae
<i>Erigeron glaucus</i> Ker.	Seaside Daisy	Compositae
<i>Eriogonum parvifolium</i> Sm.	Wild Buckwheat	Polygonaceae
<i>Eriophyllum confertiflorum</i> Gray		Compositae
<i>Eriophyllum staechadifolium</i> Lag.	Lizard Tail	Compositae
<i>Erodium cicutarium</i> * L'Her.	Red-stem Filaree	Geraniaceae
<i>Erodium moschatum</i> * L'Her.	White-stem Filaree	Geraniaceae
<i>Eryngium armatum</i> C. & R.	Coast Eryngium	Umbelliferae
<i>Eschscholtzia californica</i> Cham.	California Poppy	Papaveraceae
<i>Euphorbia crenulata</i> Engelm.	Spurge	Euphorbiaceae
<i>Festuca bromoides</i> * L.	Fescue	Gramineae
<i>Festuca myuros</i> * L.	Rat-tail Fescue	Gramineae
<i>Filago californica</i> Nutt.		Compositae
<i>Fragaria californica</i> C. & S.	Wood Strawberry	Rosaceae
<i>Franseria bipinnatifida</i> Nutt.		Compositae
<i>Galium aparine</i> * L.	Goose Grass	Rubiaceae
<i>Galium californicum</i> H. & A.	Bedstraw	Rubiaceae
<i>Gaultheria shallon</i> Pursh	Salal	Ericaceae
<i>Geranium dissectum</i> * L.	Common Geranium	Geraniaceae
<i>Gilia multicaulis</i> Benth.	Gilia	Polemoniaceae
<i>Gilia peduncularis</i> Eastw.		Polemoniaceae
<i>Gnaphalium bicolor</i> Bioletti		Compositae
<i>Gnaphalium chilense</i> Spreng	Cotton-batting Plant	Compositae
<i>Gnaphalium decurrens</i> Ives var. <i>californicum</i> Gray	California Everlasting	Compositae
<i>Gnaphalium purpureum</i> L.	Purple Cudweed	Compositae
<i>Gnaphalium ramosissimum</i> Nutt.	Pink Everlasting	Compositae
<i>Godetia bottae</i> Spach.	Godetia	Onagraceae
<i>Grindelia robusta</i> Nutt. var. <i>platyphylla</i> Greene	Gum Plant	Compositae
<i>Gymnogramme triangularis</i> Kaulf.	Gold Fern	Pteridophyta
<i>Habenaria michauxii</i> Greene	Rein-orchis	Orchidaceae
<i>Hazardia squarrosa</i> Greene		Compositae
<i>Hemizonia corymbosa</i> (DC.) T. & G.	Tarweed	Compositae
<i>Hemizonia corymbosa</i> (DC.) T. & G. var. <i>angustifolia</i> (DC.) Jepson	Tarweed	Compositae
<i>Heuchera micrantha</i> Dougl.	Alum-root	Saxifragaceae
<i>Heuchera pilosissima</i> F. & M.	Hairy Alum-root	Saxifragaceae
<i>Hordeum gussoneanum</i> * Parl.	Mediterranean Barley	Gramineae
<i>Hordeum jubatum</i> L.	Squirrel-tail Barley	Gramineae

* Plants not native to the region.

PLANTS OF POINT LOBOS RESERVE—Continued

Scientific name	Common name	Family
<i>Hordeum murinum</i> * L.	Wall Barley	Gramineae
<i>Hordeum nodosum</i> L.	Meadow Barley	Gramineae
<i>Hypochoeris glabra</i> * L.	Smooth Cat's Ear	Compositae
<i>Hypochoeris radicata</i> * L.	Hairy Cat's Ear	Compositae
<i>Iris douglasiana</i> Herbert	Mountain Iris	Iridaceae
<i>Juncus bufonius</i> L.	Toad Rush	Juncaceae
<i>Juncus occidentalis</i> (Cov.) Wiegand	Western Rush	Juncaceae
<i>Junus phaeocephalus</i> Engelm.	Brown-headed Rush	Juncaceae
<i>Koeleria cristata</i> (L.) Pers.		Gramineae
<i>Lathyrus strictus</i> Nutt.	Purple pea	Leguminosae
<i>Layia platyglossa</i> (F. & M.) Gray	Tidytips	Compositae
<i>Lepidium bipinnatifidum</i> * Desv.	Wayside Pepper-grass	Cruciferae
<i>Lepidium nitidum</i> Nutt.	Common Pepper-grass	Cruciferae
<i>Lepturus cylindricus</i> (Willd.) Trin.		Gramineae
<i>Linanthus androsaceus</i> (Benth.) Greene		Polemoniaceae
<i>Linaria canadensis</i> (L.) Dum. var. <i>texana</i> (Scheele) Pennell	Toad Flax	Scrophulariaceae
<i>Lithophragma heterophylla</i> T. & G.		Saxifragaceae
<i>Lolium multiflorum</i> * Lam.	Perennial Rye-grass	Gramineae
<i>Lomatium parvifolium</i> (T. & G.) Jepson	Hog-fennel	Umbelliferae
<i>Lotus americanus</i> (Nutt.) Bisch.	Spanish Clover	Leguminosae
<i>Lotus benthamii</i> Greene		Leguminosae
<i>Lotus eriophorus</i> Greene		Leguminosae
<i>Lotus formosissimus</i> Greene	Witch's Teeth	Leguminosae
<i>Lotus micranthus</i> Benth.		Leguminosae
<i>Lotus scoparius</i> (Nutt.) Otley	Deer-weed	Leguminosae
<i>Lotus strigosus</i> (Nutt.) Greene		Leguminosae
<i>Lotus subpinnatus</i> Lag.		Leguminosae
<i>Lupinus arboreus</i> Sims.	Yellow Lupine	Leguminosae
<i>Lupinus nanus</i> Dougl.		Leguminosae
<i>Lupinus varicolor</i> Steud.		Leguminosae
<i>Luzula campestris</i> (L.) DC. var. <i>congesta</i> Buch.	Common Wood Rush	Juncaceae
<i>Lythrum californicum</i> T. & G.	Common Loosestrife	Lythraceae
<i>Lythrum hyssopifolia</i> L.	Grass Poly	Lythraceae
<i>Madia dissitiflora</i> (Nutt.) T. & G.	Gum-weed	Compositae
<i>Malva rotundifolia</i> L.	Dwarf Mallow	Malvaceae
<i>Marrubium vulgare</i> L.	Common Horehound	Labiatae
<i>Medicago hispida</i> Gaertn.	Bur Clover	Leguminosae
<i>Melica imperfecta</i> Trin.		Gramineae
<i>Melilotus indica</i> All.	Yellow Sweet Clover	Leguminosae
<i>Mesembryanthemum crystallinum</i> L.	Ice Plant	Aizoaceae
<i>Mesembryanthemum edule</i> L.	Hottentot Fig	Aizoaceae
<i>Microcala quadrangularis</i> (Lam.) Griseb.		Gentianaceae
<i>Microseris bigelovii</i> Gray		Compositae
<i>Montia minor</i> C. Gmel.	Water Chickweed	Portulacaceae
<i>Montia perfoliata</i> (Donn) Howell	Miner's Lettuce	Portulacaceae
<i>Myrica californica</i> Cham.	Wax Myrtle	Myricaceae
<i>Nemophila aurita</i> Lindl.	Fiesta Flower	Hydrophyllaceae
<i>Nemophila heterophylla</i> F. & M.	Small White Nemophila	Hydrophyllaceae
<i>Nemophila menziesii</i> H. & A.	Baby Blue-eyes	Hydrophyllaceae
<i>Oenante sarmenosa</i> Presl.		Umbelliferae
<i>Oenothera micrantha</i> Hornem.		Onagraceae
<i>Oenothera ovata</i> Nutt.	Golden Eggs	Onagraceae
<i>Oenothera spiralis</i> Hook.	Curly Pod	Onagraceae
<i>Orobanche californica</i> C. & S.	Broom-rape	Orobanchaceae
<i>Orthocarpus purpurascens</i> Benth.	Escobita	Scrophulariaceae
<i>Orthocarpus pusillus</i> Benth.		Scrophulariaceae
<i>Osmaronia cerasiformis</i> (T. & G.) Greene	Oso Berry	Rosaceae
<i>Oxalis pilosa</i> Nutt.	Yellow Sorrel	Oxalidaceae
<i>Pentstemon ramosissimus</i> H. & A.	Sand Mat	Caryophyllaceae
<i>Phacelia distans</i> Benth.	Phacelia	Hydrophyllaceae
<i>Phacelia malvaefolia</i> Cham.	Stinging Phacelia	Hydrophyllaceae
<i>Phalaris californica</i> H. & A.	California Canary Grass	Gramineae
<i>Pholiusurus incurvus</i> (L.) Schinz. & Thell.		Gramineae
<i>Photinia arbutifolia</i> Lindl.	Toyon	Rosaceae
<i>Phyllospadix seouleri</i> Hook.	Surf Grass	Naiadaceae
<i>Pinus radiata</i> Don.	Monterey Pine	Pinaceae

* Plants not native to the region.

PLANTS OF POINT LOBOS RESERVE—Continued

Scientific name	Common name	Family
<i>Plantago bigelovii</i> Gray		Plantaginaceae
<i>Plantago erecta</i> Morris		Plantaginaceae
<i>Plantago major</i> * L.	Common Plantain	Plantaginaceae
<i>Plantago maritima</i> L.	Goose Tongue	Plantaginaceae
<i>Platystemon californicus</i> Benth.	Cream Cuss	Papaveraceae
<i>Plectritis macrocera</i> T. & G.		Valerianaceae
<i>Poa annua</i> L.	Annual Bluegrass	Gramineae
<i>Poa douglasii</i> Nees		Gramineae
<i>Polycarpon depressum</i> Nutt.		Caryophyllaceae
<i>Polypodium vulgare</i> L. var. <i>kaufusii</i> (DC. Eat.) Fer.	California Polypody	Polypodiaceae
<i>Polypogon monspeliensis</i> * (L.) Desf.	Beard Grass	Gramineae
<i>Populus trichocarpa</i> T. & G.	Black Cottonwood	Salicaceae
<i>Potentilla californica</i> (C. & S.) Greene		Rosaceae
<i>Potentilla frondosa</i> Greene		Rosaceae
<i>Potentilla glandulosa</i> Lindl.		Rosaceae
<i>Psilocarphus tenellus</i> Nutt.		Compositae
<i>Pteridium aquilinum</i> (L.) Kuhn var. <i>pubescens</i> Underw.	Bracken	Polypodiaceae
<i>Pterostegia drymarioides</i> F. & M.		Polygonaceae
<i>Quercus agrifolia</i> Nees	Coast Live Oak	Fagaceae
<i>Ranunculus californicus</i> Benth.	California Buttercup	Ranunculaceae
<i>Raphanus sativus</i> * L.	Wild Radish	Cruciferae
<i>Rhamnus californica</i> Esch.	Coffee Berry	Rhamnaceae
<i>Rhus diversiloba</i> T. & G.	Poison Oak	Anacardiaceae
<i>Ribes menziesii</i> Pursh. var. <i>hystrix</i> (Eastw.) Jepson	Canyon Gooseberry	Saxifragaceae
<i>Ribes sanguineum</i> Pursh. var. <i>glutinosum</i> Loud.	Flowering Currant	Saxifragaceae
<i>Rosa californica</i> C. & S.	California Rose	Rosaceae
<i>Rosa gymnocarpa</i> Nutt. var. <i>pinetorum</i> (Heller) Jepson	Wood Rose	Rosaceae
<i>Rubus vitifolius</i> C. & C.	California Blackberry	Rosaceae
<i>Rumex acetosella</i> * L.	Sheep Sorrel	Polygonaceae
<i>Rumex crispus</i> * L.	Curly Dock	Polygonaceae
<i>Rumex pulcher</i> * L.	Fiddle Dock	Polygonaceae
<i>Rumex salicifolius</i> Weinm.	Willow Dock	Polygonaceae
<i>Sagina occidentalis</i> Wats.	Western Pearlwort	Carophyllaceae
<i>Salix lasiolepis</i> Benth.	Arroyo Willow	Salicaceae
<i>Salix scouleriana</i> Nutt.	Scouler Willow	Salicaceae
<i>Salvia columbariae</i> Benth.	Chia	Labiatae
<i>Sambucus glauca</i> Nutt.	Blue Elderberry	Caprifoliaceae
<i>Sanicula arctopoides</i> H. & A.	Footsteps of Spring	Umbelliferae
<i>Sanicula laciniata</i> H. & A.	Coast Sanicle	Umbelliferae
<i>Sanicula menziesii</i> H. & A.	Gamble Weed	Umbelliferae
<i>Saxifraga virginiana</i> Michx. var. <i>cali-</i> <i>fornica</i> Jepson	Saxifrage	Saxifragaceae
<i>Scirpus carinatus</i> (H. & A.) Gray	Dwarf Club-rush	Cyperaceae
<i>Scirpus cernuus</i> Vahl	Slender Club-rush	Cyperaceae
<i>Scleropoa rigida</i> * (L.) Griseb.		Gramineae
<i>Scorzonella paludosa</i> Greene var. <i>integri-</i> <i>folia</i> Jepson		Compositae
<i>Scrophularia californica</i> Chem.	California Bee Plant	Scrophulariaceae
<i>Selaginella bigelovii</i> Underw.		Selaginellaceae
<i>Sidalcea malvaeflora</i> Gray	Cheeker Boom	Malvaceae
<i>Silene gallica</i> * L.	Windmill Pink	Caryophyllaceae
<i>Silene multinervis</i> Wats.	Coast Catchfly	Caryophyllaceae
<i>Sisyrinchium bellum</i> Wats.	Blue-eyed Grass	Iridaceae
<i>Smilacina amplexicaulis</i> Nutt.	Fat Solomon	Liliaceae
<i>Solanum douglasii</i> Dunal	Nightshade	Solanaceae
<i>Solanum nigrum</i> * L.	Black Nightshade	Solanaceae
<i>Solidago californica</i> Nutt.	California Goldenrod	Compositae
<i>Sotima sessilis</i> R. & P.		Compositae
<i>Sonchus oleraceus</i> * L.	Sow Thistle	Compositae
<i>Spergula arvensis</i> * L.	Corn Spurrey	Caryophyllaceae
<i>Spergularia macrotheca</i> (Hornem.) Heynh.	Sand Spurrey	Caryophyllaceae
<i>Spergularia rubra</i> * (L.) J. & C. Presl. var. <i>perrennans</i> (Kindb.) Rob.		Caryophyllaceae

* Plants not native to the region.

PLANTS OF POINT LOBOS RESERVE—Continued

Scientific name	Common name	Family
<i>Stachys californica</i> Benth.	Hedge Nettle	Labiatae
<i>Statice arctica</i> Blake var. <i>californica</i> Blake	Sea Pink	Plumbaginaceae
<i>Stellaria media</i> * (L.) Cyr.	Common Chickweed	Caryophyllaceae
<i>Stephanomeria virgata</i> Benth.	Summer Chicory	Compositae
<i>Stipa pulchra</i> Hitchc.	Purple Needlegrass	Gramineae
<i>Symphoricarpos mollis</i> Nutt.	Dwarf Waxberry	Caprifoliaceae
<i>Thelypodium lasiophyllum</i> (H. & A.) Greene		Cruciferae
<i>Tillaea erecta</i> H. & A.		Crassulaceae
<i>Tricentalis europaea</i> L. var. <i>latifolia</i> Torr.	Star-flower	Primulaceae
<i>Trifolium amplexens</i> T. & G.		Leguminosae
<i>Trifolium barbigerum</i> Torr.		Leguminosae
<i>Trifolium gracilentum</i> T. & G.	Pinpoint Clover	Leguminosae
<i>Trifolium involucreatum</i> Ort.	Cow Clover	Leguminosae
<i>Trifolium macraei</i> H. & A.		Leguminosae
<i>Trifolium microcephalum</i> Pursh.		Leguminosae
<i>Trifolium tridentatum</i> Lindl.	Tomcat Clover	Leguminosae
<i>Uropappus linearifolius</i> Nutt.		Compositae
<i>Vicia americana</i> Muhl.	American Vetch	Leguminosae
<i>Vicia erigua</i> Nutt.	California Vetch	Leguminosae
<i>Viola pedunculata</i> T. & G.	Yellow Pansy	Violaceae
<i>Woodwardia chamissoi</i> Brack.	Chain Fern	Polyodiaceae
<i>Zostera marina</i> L.	Eel Grass	Naiadaceae
<i>Zygadenus fremontii</i> Wats.		Liliaceae

Liverworts-Hepaticae

<i>Anthoceros</i> sp.		Anthocerotaceae
<i>Asterella californica</i> (Hampe) Underw.		Marchantiaceae
<i>Fossombronina longiseta</i> Aust.		Metzgeriaceae
<i>Riccia campbelliana</i> Howe		Ricciaceae
<i>Riccia nigrella</i> DC.		Ricciaceae
<i>Riccia sorocarpa</i> Bisch.		Ricciaceae
<i>Sphaerocarpos</i> sp.		Sphaerocarpaceae
<i>Targionia hypophylla</i> L.		Marchantiaceae

* Plants not native to the region.

Characteristic Intertidal Marine Animals of Point Lobos Reserve †

Phylum and class	Scientific name	Common name ¹	
Porifera (sponges)	<i>Haliclona permollis</i>	Purple sponge	
	<i>Leuconia heathi</i>		
	<i>Leucosolenia eleanor</i>		
	<i>Lissodendoryx noxiosa</i>	Yellow sponge	
	<i>Ophlitaspongia pennata</i>	Red sponge	
	<i>Rhabdoderrella nuttingi</i>	Vase sponge	
	<i>Plocamia karykina</i>	Red sponge	
Cocenterata			
	Hydrozoa (hydroids)	<i>Aglaophenia struthionides</i>	Feather hydroid
		<i>Garcia annulata</i>	Golden hydroid
		<i>Eudendrium californicum</i>	
Anthozoa (Corals and sea anemones)	<i>Anthopleura xanthogrammica</i>	Large green anemone	
	<i>Corynactis species</i>		
	<i>Epiactis prolifera</i>	Brooking anemone	
	<i>Evactis artemisia</i>	Gregarious anemone	
	<i>Urticina crassicornis</i>	Large red anemone, sea dahlia	
	<i>Balanophyllia elegans</i>	Solitary coral	

† By W. K. Fisher.

¹ Other than shells and crabs, few invertebrates possess an actual common name; most of such names exist only in books, not in the vernacular.

Characteristic Intertidal Marine Animals of Point Lobos Reserve—Continued

Phylum and class	Scientific name	Common name ¹
<i>Platyhelminthes</i>		
Turbellaria	<i>Leptoplana acticola</i>	
(flat worms)	<i>Planocera californica</i>	
<i>Nemertea</i>		
(ribbon worms)	<i>Amphiporus bimaculatus</i>	
	<i>Emplectonema gracile</i>	
	<i>Lineus vegetus</i>	
	<i>Paranemertes peregrina</i>	
<i>Bryozoa</i>		
(Moss animals)	<i>Bugula californica</i>	
	<i>Eurystomella bilabiata</i>	
	<i>Flustra lichenoides</i>	
	<i>Membranipora membranacea</i>	
	<i>Phidolophora pacifica</i>	
<i>Annelida</i>		
(Segmented worms)	<i>Amphitrite robusta</i>	Terebellid
	<i>Cirriformia luxuriosa</i>	Mermaid worm
	<i>Dodecaceria pacifica</i>	
	<i>Eudistylia polymorpha</i>	Feather duster worm
	<i>Halosydna brevisotosa</i>	Scaled worm
	<i>Nereis procera</i>	Green worm
	<i>Nereis verilliosa</i>	Mussel worm
	<i>Sabellaria californica</i>	Tube worm
	<i>Spirorbis spirillum</i>	Small tube worm
	<i>Thelepus plagiostoma</i>	Terebellid
<i>Sipunculoidea</i>		
(bag worms)	<i>Dendrostoma petraeum</i>	Bushy-headed bag worm
	<i>Physcosoma agassizi</i>	Agassiz bag worm
<i>Echinodermata</i>		
<i>Asteroidea</i>	<i>Henricia leviuscula</i>	Blood star
(Sea stars)	<i>Leptasterias aequalis</i>	Six-rayed starlet
	<i>L. pusilla</i>	Pigmy starlet
	<i>Patiria miniata</i>	Short-rayed star
	<i>Pisaster ochraceus</i>	Common star
	<i>Pycnopodia helianthoides</i>	Twenty-rayed star
<i>Ophiuroidea</i>	<i>Ophioplocus esmarki</i>	Smooth serpent star
(Serpent stars)	<i>Ophiopteris papillosa</i>	Papillose serpent star
	<i>Ophiothrix spiculata</i>	Glassy-spined serpent star
<i>Echinoidea</i>	<i>Strongylocentrotus franciscanus</i>	Giant urchin
(Sea urchins)	<i>S. purpuratus</i>	Purple urchin
<i>Holothurioidea</i>	<i>Cucumaria quinquesemita</i>	
(Sea cucumbers)	<i>Stichopus californicus</i>	
<i>Arthropoda</i>		
<i>Crustacea</i>	<i>Balanus glandula</i>	Rock barnacle
(Crabs, shrimps)	<i>Mitella polymera</i>	Stem barnacle
	<i>Tetraclita squamosa rubescens</i>	Volcano barnacle
	<i>Orchestoidea californica</i>	Sand hopper
	<i>Lidyda occidentalis</i>	Rock crawler
	<i>Crangon dentipes</i>	Pistol shrimp
	<i>Cryptolithodes sitchensis</i>	Umbrella crab
	<i>Hapalogaster cavicauda</i>	Mossy crab
	<i>Pagurus samuelis</i>	Common hermit
	<i>Petrolisthes cinctipes</i>	Porcelain crab
<i>Crustacea</i>	<i>Cancer antennarius</i>	common crab
(Crabs, shrimps)	<i>C. productus</i>	red crab
	<i>Hemigrapsus nudus</i>	purple shore crab
	<i>Lophopanopeus heathi</i>	midget crab
	<i>Loxorhynchus crispatus</i>	masking crab
	<i>Mithus foliatus</i>	
	<i>Pachygrapsus crassipes</i>	striped shore crab, Sally Lightfoot
	<i>Pararenthias taylora</i>	warty crab
	<i>Pugettia producta</i>	kelp crab
	<i>Scyra acutifrons</i>	sharp nosed masking crab

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Characteristic Intertidal Marine Animals of Point Lobos Reserve—Continued

<i>Phylum and class</i>	<i>Scientific name</i>	<i>Common name</i> ¹
<i>Mollusca</i>		
Amphineura (Chitons)	<i>Cryptochiton stelleri</i>	giant chiton
	<i>Ischnociton magdalenensis</i>	gray chiton
	<i>I. reularis</i>	blue chiton
	<i>Katherina tunicata</i>	black chiton
	<i>Lepidochitona lineata</i>	lined chiton
	<i>Mopalia muscosa</i>	hairy chiton
	<i>Nuttallina californica</i>	California chiton
	<i>Placiphorella velata</i>	veiled chiton
Gastropoda (Limpets, snails)	<i>Acmaea digitalis (persona)</i>	dingy limpet
	<i>A. limatula (scabra)</i>	file limpet
	<i>A. mitra</i>	white cap
	<i>A. pella</i>	shield limpet
	<i>A. scabra (spectrum)</i>	ribbed limpet
	<i>A. scutum (patina)</i>	plate limpet
	<i>Lottia gigantea</i>	owl limpet
	<i>Calliostoma dnnulatum</i>	ringed top shell
	<i>C. canaliculatum</i>	channeled top shell
	<i>Astraea inaequalis</i>	red top shell
	<i>Diadora aspera</i>	rough key-hole limpet
	<i>Fissurella volcano</i>	volcano shell
	<i>Haliotis cracherodii</i>	black abalone
	<i>Megathura crenulata</i>	giant key-hole limpet
	<i>Tegula brunnea</i>	brown turban
	<i>Tegula funebris</i>	black turban
	<i>Aletes squamigerus</i>	worm mollusk
	<i>Crepidula adunca</i>	hooked slipper shell
	<i>Littorina planaxis</i>	gray littorine
	<i>L. scutulata</i>	checkered littorine
	<i>Purpura foliata</i>	leafy horn mouth
	<i>Thais emerginata</i>	short-spined purple
	<i>Gadinia reticulata</i>	button shell
	<i>Anisodoris nobilis</i>	sea lemon
	<i>Archidoris montereyensis</i>	
	<i>Cadlina marginata</i>	
	<i>Diavulus sandiegensis</i>	
	<i>Glossodoris californicus</i>	
	<i>Hopkinsia rosacea</i>	rose nudibranch
	<i>Rostangia pulchra</i>	
	<i>Triopha carpenteri</i>	
	<i>T. maculata</i>	
Pelecypoda (Clams, mussels)	<i>Hinnites giganteus</i>	rock oyster
	<i>Mytilus californianus</i>	California mussel
	<i>Chama pellucida</i>	rock oyster
	<i>Pholadidea penita</i>	rock borer
	<i>Saxicava pholadis</i>	rock borer
	<i>Venerupis staminea</i>	rock cockle
Cephalopoda (Squids, devilfish)	<i>Paroctopus</i>	devil fish
<i>Tunicata</i> (Sea squirts)	<i>Amaroucium californicum</i>	
	<i>Clavelina hunsmani</i>	
	<i>Distaplia occidentalis</i>	
	<i>Eudistoma psammion</i>	
	<i>E. diaphanes</i>	
	<i>Perophora annectens</i>	
	<i>Polyclinum planum</i>	
<i>Vertebrata</i>		
Pisces (Fishes)	<i>Apodichthys flavidus</i>	blenny
	<i>Caularchus meandrinus</i>	cling fish
	<i>Clinocottus analis</i>	sculpin
	<i>Epigeichthys atropurpureus</i>	blenny
	<i>Montereya rcalva</i>	sculpin

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III

BIRDS OF POINT LOBOS RESERVE *

- Common Loon—*Gavia immer* (Brunnich)
 Pacific Loon—*Gavia pacifica* (Linnaeus)
 Red-throated Loon—*Gavia stellata* (Pontoppidan)
 Holboell Grebe—*Colymbus grisegena* Boddaert
 Horned Grebe—*Colymbus auritus* Linnaeus
 Eared Grebe—*Colymbus nigricollis* (Brehm)
 Western Grebe—*Aechmophorus occidentalis* (Lawrence)
 Sooty Shearwater—*Puffinus griseus* (Gmelin)
 Black-vented Shearwater—*Puffinus opisthomelas* Coues
 Brown Pelican—*Pelecanus occidentalis* Linnaeus
 Farallon Cormorant—*Phalacrocorax auritus* (Lesson)
 Brandt Cormorant—*Phalacrocorax penicillatus* (Brandt)
 Pelagic Cormorant—*Phalacrocorax pelagicus* Pallas
 Great Blue Heron—*Ardea herodias* Linnaeus
 American Egret—*Casmerodius albus* (Linnaeus)
 Canada Goose—*Branta canadensis* (Linnaeus)
 Black Brant—*Branta nigricans* (Lawrence)
 American Golden-Eye—*Glaucionetta clangula* (Linnaeus)
 White-winged Scoter—*Melanitta deglandi* (Bonaparte)
 Surf Scoter—*Melanitta perspicillata* (Linnaeus)
 Ruddy Duck—*Erismatura jamaicensis* (Gmelin)
 Red-breasted Merganser—*Mergus serrator* Linnaeus
 Turkey Vulture—*Cathartes aura* (Linnaeus)
 Sharp-shinned Hawk—*Accipiter velox* (Wilson)
 Cooper Hawk—*Accipiter cooperii* (Bonaparte)
 Red-tailed Hawk—*Buteo borealis* (Gmelin)
 Golden Eagle—*Aquila chrysaetos* (Linnaeus)
 Marsh Hawk—*Circus hudsonius* (Linnaeus)
 Duck Hawk—*Falco peregrinus* Tunstall
 Pigeon Hawk—*Falco columbarius* Linnaeus
 Sparrow Hawk—*Falco sparverius* Linnaeus
 California Quail—*Lophortyx californica* (Shaw)
 Black Oyster catcher—*Haematopus bachmani* Audubon
 Killdeer—*Oxyechus vociferus* (Linnaeus)
 Ruddy Turnstone—*Arenaria interpres* (Linnaeus)
 Black Turnstone—*Arenaria melanocephala* (Vigors)
 Wilson Snipe—*Capella delicata* (Ord)
 Hudsonian Curlew—*Phaeopus hudsonicus* (Latham)
 Spotted Sandpiper—*Actitis macularia* (Linnaeus)
 Wandering Tattler—*Heteroscelus incanus* (Gmelin)
 Western Sandpiper—*Ereunetes mauri* Cabanis
 Red Phalarope—*Phalaropus fulicarius* (Linnaeus)
 Glaucous-winged Gull—*Larus glaucescens* Naumann
 Western Gull—*Larus occidentalis* Audubon
 California Gull—*Larus californicus* Lawrence
 Ring-billed Gull—*Larus delawarensis* Ord
 Bonaparte Gull—*Larus philadelphia* (Ord)
 Heermann Gull—*Larus heermanni* Cassin
 Royal Tern—*Thalasseus maximus* (Boddaert)
 California Murre—*Uria aalge* (Pontoppidan)
 Pigeon Guillemot—*Cephus columba* Pallas
 Ancient Murrelet—*Synthliboramphus antiquus* (Gmelin)
 Band-tailed Pigeon—*Columba fasciata* Say
 Mourning Dove—*Zenaidura macroura* (Linnaeus)
 Road runner—*Geococcyx californianus* (Lesson)
 Barn Owl—*Tyto alba* (Scopoli)
 Screech Owl—*Otus asio* (Linnaeus)
 Great Horned Owl—*Bubo virginianus* (Gmelin)
 Burrowing Owl—*Speotyto cunicularia* (Molina)
 Black Swift—*Nephoecetes niger* (Gmelin)
 White-throated Swift—*Aeronautes saratatis* (Woodhouse)
 Anna Hummingbird—*Calypte anna* (Lesson)
 Rufous Hummingbird—*Selasphorus rufus* (Gmelin)
 Allen Hummingbird—*Selasphorus alleni* Henshaw
 Belted Kingfisher—*Megasceryle alcyon* (Linnaeus)
 Yellow-shafted Flicker—*Colaptes auratus* (Linnaeus)
 Red-shafted Flicker—*Colaptes cafer* (Gmelin)
 Acorn-storing Woodpecker—*Balanosphyra formicivora* (Swainson)
 Lewis Woodpecker—*Asyndesmus lewis* Gray

* Birds found in Point Lobos Reserve, 1934-35. By Joseph Grinnell and Jean Linsdale.

Red-breasted Sapsucker—*Sphyrapicus varius* (Linnaeus)
 Hairy Woodpecker—*Dryobates villosus* (Linnaeus)
 Downy Woodpecker—*Dryobates pubescens* (Linnaeus)
 Nuttall Woodpecker—*Dryobates nuttallii* (Gambel)
 Arkansas Kingbird—*Tyrannus verticalis* Say
 Cassin Kingbird—*Tyrannus vociferans* Swainson
 Ash-throated Flycatcher—*Myiarchus cinerascens* (Lawrence)
 Black Phoebe—*Sayornis nigricans* (Swainson)
 Say Phoebe—*Sayornis saya* (Bonaparte)
 Traill Flycatcher—*Empidonax traillii* (Audubon)
 Wright Flycatcher—*Empidonax wrightii* Baird
 Western Flycatcher—*Empidonax difficilis* Baird
 Wood Pewee—*Myiochanes virens* (Linnaeus)
 Olive-sided Flycatcher—*Nuttallornis mesoleucus* (Lichtenstein)
 Horned Lark—*Otocoris alpestris* (Linnaeus)
 Violet-green Swallow—*Tachycineta thalassina* (Swainson)
 Tree Swallow—*Iridoprocne bicolor* (Vieillot)
 Rough-winged Swallow—*Stelgidopteryx ruficollis* (Vieillot)
 Barn Swallow—*Hirundo erythrogaster* Boddaert
 Cliff Swallow—*Petrochelidon albifrons* (Rafinesque)
 Purple Martin—*Progne subis* (Linnaeus)
 Steller Jay—*Cyanocitta stelleri* (Gmelin)
 California Jay—*Aphelocoma californica* (Vigors)
 Yellow-billed Magpie—*Pica nuttallii* (Audubon)
 Crow—*Corvus brachyrhynchos* Brehm
 Clark Nutcracker—*Nucifraga columbiana* (Wilson)
 Chestnut-backed Chickadee—*Penthestes rufescens* (Townsend)
 Bush-tit—*Psaltriparus minimus* (Townsend)
 White-breasted Nuthatch—*Sitta carolinensis* Latham
 Red-breasted Nuthatch—*Sitta canadensis* Linnaeus
 Pigmy Nuthatch—*Sitta pygmaea* Vigors
 Brown Creeper—*Certhia familiaris* Linnaeus
 Wren-tit—*Chamaea fasciata* (Gambel)
 House Wren—*Troglodytes aedon* Vieillot
 Winter Wren—*Tannus hiemalis* (Vieillot)
 Bewick Wren—*Thryomanes bewickii* (Audubon)
 Long-billed Marsh Wren—*Telmatodytes palustris* (Wilson)
 Mockingbird—*Mimus polyglottos* (Linnaeus)
 California Thrasher—*Toxostoma redivivum* (Gambel)
 Robin—*Turdus migratorius* Linnaeus
 Hermit Thrush—*Hylocichla guttata* (Pallas)
 Russet-backed Thrush—*Hylocichla ustulata* (Nuttall)
 Western Bluebird—*Sialia mexicana* Swainson
 Blue-gray Gnatcatcher—*Poliophtila caerulea* (Linnaeus)
 Ruby-crowned Kinglet—*Corthylio calendula* (Linnaeus)
 Pipit—*Anthus spinoletta* (Linnaeus)
 Loggerhead Shrike—*Lanius ludovicianus* Linnaeus
 Hutton Vireo—*Vireo huttoni* Cassin
 Orange-crowned Warbler—*Vermivora celata* (Say)
 Yellow Warbler—*Dendroica aestiva* (Gmelin)
 Audubon Warbler—*Dendroica auduboni* (Townsend)
 Black-throated Gray Warbler—*Dendroica nigrescens* (Townsend)
 Townsend Warbler—*Dendroica townsendi* (Townsend)
 Hermit Warbler—*Dendroica occidentalis* (Townsend)
 Tolmie Warbler—*Oporornis tolmiei* (Townsend)
 Yellow-throat—*Geothlypis trichas* (Linnaeus)
 Pileolated Warbler—*Wilsonia pusilla* (Wilson)
 English Sparrow—*Passer domesticus* (Linnaeus)
 Western Meadowlark—*Sturnella neglecta* Audubon
 Red-winged Blackbird—*Agelaius phoeniceus* (Linnaeus)
 Bullock Oriole—*Icterus bullockii* (Swainson)
 Brewer Blackbird—*Euphagus cyanocephalus* (Wagler)
 Lazuli Bunting—*Passerina amoena* (Say)
 Purple Finch—*Carpodacus purpureus* (Gmelin)
 Linnet—*Carpodacus mexicanus* (Müller)
 Pine Siskin—*Spinus pinus* (Wilson)
 Green-backed Goldfinch—*Spinus psaltria* (Say)
 Spotted Towhee—*Pipilo maculatus* Swainson
 Savannah Sparrow—*Passerculus sandwichensis* (Gmelin)
 Oregon Junco—*Junco oregonus* (Townsend)
 Chipping Sparrow—*Spizella passerina* (Bechstein)
 White-crowned Sparrow—*Zonotrichia leucophrys* (Forster)
 Fox Sparrow—*Passerella iliaca* (Audubon)
 Lincoln Sparrow—*Passerella lincolni* (Audubon)
 Song Sparrow—*Passerella melodia* (Wilson)

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