PRICE SEVENTY-FIVE CENTS.

WITH THREE MAPS.

WESTERN AMERICA,

INCLUDING

CALIFORNIA AND OREGON,

WITH

MAPS OF THOSE REGIONS,

AND OF

"THE SACRAMENTO VALLEY."

FROM

ACTUAL SURVEYS.

BY CHARLES WILKES, U. S. N.,

COMMANDER OF THE U. S. EXPLORING EXPEDITION, &c.

PHILADELPHIA:

LEA AND BLANCHARD.

1849.

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STEREOTYPED BY J. FAGAN.
PRINTED BY C. SHERMAN.

TO PETER FORCE, ESQ.

PRESIDENT OF THE NATIONAL INSTITUTE.

SIR:—

As this small memoir has grown out of the request the Institute did me the honour to make at our late meeting, to prepare a correct Topographical Map of the Valley of the Sacramento, I beg leave to dedicate it to you, and to trust that the revival of the Institute may be attended with all the success that was fondly anticipated and desired by its founders.

With sincere regard and esteem,
I am, with great respect,
Your ob't Serv't,
CHARLES WILKES.

PREFACE.

This memoir on California and Oregon has been prepared at the suggestion of many friends, and from a desire to satisfy the numerous applications that have been made to me for information respecting the former.

The information has been mainly derived from the materials gathered by me whilst the Exploring Expedition was on the north-west coast, and much of it from actual examinations and surveys, made by parties fitted out for the exploration of those two territories, which have since become portions of the United States, and are now claiming the almost undivided attention of the public mind. When writing the narrative, much information was laid aside which wanted interest before these two territories became portions of the public domain.

As there will be no official opportunity offered for giving these to the public, and as many, and indeed most of the material facts would otherwise be lost, I have therefore collected them in this memoir. I have also made some extracts from the volumes of the gentlemen composing the Scientific Corps that have been published; but owing to the limited number of copies

printed by the government, I hope this memoir may call additional attention to the services rendered by them, as well as those performed by the Expedition.

For descriptions of parts of the country not visited by the Expedition, I am indebted to the official reports of Lieutenant-Colonels Emory and Frémont, and also to Father de Smets, of the Society of Jesus, who, whilst attending to his duties as a missionary among the Indian tribes on both sides of the Rocky Mountains, obtained a large amount of geographical information, which he kindly placed at my disposal.

This publication is made, with the hope that it may give that information which will be useful in legislation, as well as to those who intend emigrating to California.

CHARLES WILKES.

WASHINGTON, February 1, 1849.

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WESTERN AMERICA.

CHAPTER I.

GENERAL SKETCH.

The general features of Western America are well known, even from our earliest maps, so far as regards the trending of its great mountain-ranges; but Physical Geography now demands closer and more attentive observations; and it is readily perceived that the mountain-ranges afford but a very imperfect idea of the face of the country, or of the causes that tend to influence its capabilities for the support of man or the advancement of his civilization. A more unerring guide to a thorough knowledge of a country and its resources is the water-courses; these are but narrow threads in reality, when compared with the extent of country they pass through, and occupy more space on our maps than they do in nature; but by their number, length, and distances apart, some judgment may be formed of the extent of mountains and their altitude; they give an opportunity of judging of the surface of a country and its general level.

Under this view I have been endeavouring, for some time past, to perfect the maps of the western part of North America, which are now offered with this memoir; and by an inspection of that of Oregon, it cannot but be perceived how peculiar the contortions, extensions, and courses of its great streams are, and how well they illustrate the views given above; and I think it will be readily admitted, even on cursory examination, how much more the character of a country is illustrated by its water-courses than by its mountain-ranges, even as prominent as the latter are in Western North America. With water-courses correctly represented, we can find no difficulty in estimating the width of mountain-ranges, which on our maps repre-

sent nearly perpendicular walls; and a very tolerable idea may be formed of their slopes and water-shed, and the capacity of the neighbouring country for intercommunication. Under this view of the subject I shall, in the general description of the country, begin with the water-courses, great rivers, and lakes.

By examining the maps of California and Oregon, it will be perceived that all the great rivers have their sources between 42° and 52° of north latitude, and 109° and 118° of west longitude. This is not only true in regard to the great rivers that flow to the west and seek the Pacific, but holds equally good with those that have their courses to the south, east, and north, discharging their waters into the gulfs of California and Mexico, the Northern Atlantic and the Arctic Oceans; this fact informs us at once that the highest part of the continent of North America is situated within the above limits, in a line N. N. W. and S. S. E.; and that the breadth of this dividing range can nowhere exceed the distance between the sources of the magnificent rivers, some of which are 1000 miles in length. This area, of about 12,000 square miles, may with propriety be denominated the apex of the water-shed of North America, west of the Mississippi, for it will be found that the Columbia and Frazer's rivers, with their numerous branches, have their sources in it on the west; the Colorado, Rio del Norte, and Arkansas on the South; the Platte, Yellow Stone, and Missouri on the east; the Saskatchawan on the north-east; and the Athabasca on the north.

The lengths of the rivers show the general fall of the country through which they pass, for it is evident to all that the descent from an elevation through a short line, will be more precipitous than the longer one; this is well ascertained to be the case from the explorations that have been made, which lead us to the same conclusion as the length of the water-courses do, that the country on the east side of the Rocky Mountains has a more gentle acclivity than the western side: in the one case the distance is 1400 miles, while in the other it is but half that extent. This formation is naturally to be expected on the east, for the rivers all tend to the same main trunk without an exception; but on the west, we find anomalies in systems of rivers; though of smaller magnitude and inferior length: these make us acquainted

with the fact that other ranges of mountains must exist whose water-sheds lie principally towards the Pacific, and which exert a great influence upon the country, as to its capabilities for the uses and wants of man.

There is one great peculiarity in the rivers which flow to the west; they add little, if anything, to the fertilizing qualities of the soil, from their course being through extensive volcanic tracts of country, and, for the greater part of the distance, below the general level of the country; their banks have as yet undergone little or no decomposition.

Many of these streams flow in directly opposite directions on the same water-shed, some towards each other, and others again in a contrary direction; from which it may be readily inferred, that there is a great variety of slopes and levels, which point out the ranges, ridges, and plains that influence and cause these anomalies. By inspecting the map of California, it at once strikes us as remarkable, that over such an extent of country as is embraced by the centre, there should be such an evident deficiency of streams, leaving us at once to infer that it is a high table-land; on closer inspection, we perceive that the few small streams tend towards each other, and conclude from this fact, that it is depressed in the centre; and from the absence of streams of any length flowing from the mountains that surround it on all sides, that they have a bold and rugged acclivity. On the other hand, we would be led to think, from the appearance of the mountain streams on the opposite sides, that they not only have a less precipitous slope, but that there is a great difference in elevation of the two plains through which these streams take their course.

The results that must follow to a region hemmed in on all sides by high mountains which intercept the moisture and the winds of the ocean, as to climate, is evident. The "Great Basin" of California is thus situated: the winds that reach it, in whatever direction they come from, must pass over high ranges, and from this cause the entire space is cut off from the fertilizing effects which other and more favoured lands enjoy. The "Great Basin," however, is not the only portion of Western North America which is thus situated: the whole centre of Oregon comes very nearly under the same designation,

and had the outlet to the Columbia through the Cascade Range been denied it, would in many respects have offered very similar results to those we now see developed by the peculiar formation of the middle section of Upper California.

It will thus be seen that so far as the delineations of a country are concerned, the rivers are a more important item to point out its peculiar configuration, as regards heights, levels, and depressions, than the mountain ranges, which give one but a very faint idea of their elevations or the extent of country covered by their bases. So remarkably is this the case with the Rocky Mountains, that their base may be said to extend from the Arctic Ocean to the Gulf of Mexico in one direction, and in the other from the Pacific to the Atlantic: the minor ranges of Eastern North America are but risings on the surface, that serve to turn the waters flowing from this backbone of America but a short distance to the north and south.

Although the rivers give the most conclusive evidence relative to the character of a country, yet it would seem impossible to give a true idea of it without the mountains being represented, and in consequence they are made more or less conspicuous in comparison with their relative heights and importance.

It will be seen that in Western North America we have the Cascade Range, running nearly parallel to the coast, rivalling the Rocky Mountains in its uninterrupted length and its many snow-capped peaks: it is, however, of much less importance, when considered in relation to North America, but in reference to the western part, which now claims our attention, it has far more influence.

The height of its lofty peaks is nearly equal to the altitude of the Rocky Mountains, but its base does not exceed thirty miles in width; in its entire length from Mount St. Elias in Lat. 60° N. to Mount San Bernadino in Lat. 34° N. it has eleven volcanic peaks, viz: Mounts St. Elias, Rainier, St. Helens, Hood, Jefferson, McLaughlin, Shaste, Joseph, Smith, Simpson and San Bernadino, which are all elevated from 10,000 to 17,000 feet above the level of the sea, standing in solitary grandeur; as a mountain range, its regularity in altitude is remarkable, ranging between 5000 to 6000 feet: the southern portion rises to a greater altitude and its base becomes much

broader; the western slope is less precipitous, and may be called the water-shed of the range. The whole base is covered with dense forests.

The name by which the part that lies in Oregon has become known, and now established by usage, is the very inappropriate one of Cascade Mountains, but as custom has already sanctioned it, and there is none other that can be distingushed by a similar name, it is of no great importance; the part of the range that extends into California I have designated as the California Range, that of Sierra Nevada being as I conceive inapplicable, as there are other neighbouring mountains on which snow lies, if not all, at least nine-tenths of the year, thereby producing confusion and confounding the principal with a part of another.

This range, whether considered topographically, geologically, or in its relations with the climatology of the country, must have an important place, nor can its vast stores of minerals and magnificent forests fail to claim attention or be overlooked in estimating the future welfare and prosperity of the country.

The *Blue Mountains* form an intermediate range between the Rocky and Cascade mountains: they are extremely varying in outline and direction, and have in consequence received several names. The northern part is known as the Peak Mountains; the southern divides near Fort Boisie, the eastern spur following the bend of the Snake river and joining the Bear Mountains: it is partly connected by spurs with the Wahsatch chain, which runs on nearly the same continuous line through California. The western branch passes along the Owyhee River towards Mt. McLaughlin, of the Cascade Range: several transverse ranges, separating the extensive water-courses, unite the Blue with the Rocky Mountains; in many cases they are cut through by deep chasms, and in some points they reach above the snow line, but their general altitude is from three to four thousand feet high; the chasms afford passages for the rivers, and allow them to join the main trunk, all serving to drain this vast area, and if these rivers were navigable they would form one of the most remarkable natural inland communications on the globe; but their rapid fall, and the obstructions in their course, are such as to make their improvement impossible: although they are not susceptible of navigation through their whole length, they

will add very much to the convenience and economy of the country when it shall become settled, and for many miles will serve the purposes of local wants in the transportation of produce, &c.

The *Coast Range* of Western North America may be considered as extending from the Straits of De Fuca, with occasional interruptions, to the 34th parallel; its most northern peak is Mount Olympus, on the peninsula of Cape Flattery, which rises to the altitude of 8197 feet; the range is much broken, and varies in width from ten to thirty miles, in places resting immediately on the Pacific coast; it is generally interrupted by spurs, whose direction is at right angles with itself,—it would give a better idea of these, by describing them as a succession of high hills, with accompanying valleys, through which the streams from the Cascade Mountains find their way to the ocean. The principal of these are the Elk and Shaste Mountains, and the Boundary Range.

The Coast Range, upon its entrance into California, rises to the snow line, and continues in close proximity to the coast, forming an elevated and iron-bound shore. The bay of San Francisco, into which the Sacramento and San Joachin rivers flow, forms some interruption to its course by dividing it into two parts, which enclose this estuary; these again meet, and finally unite with the California Range, resolving themselves into the *Cordilleras*, which terminate at the extreme point of the peninsula.

It must readily be seen how great an influence these four mountain-chains must exert upon the climate and intercommunication of the country that lies between them, and how completely they cut off the eastern from the western section; that there are but two points at which this can take place, without crossing lofty mountains,—one at the Cascades, on the Columbia, the other on Frazer's River. Nature seems to have left these open; and through the former, made by the mighty river of the west, will all the commerce of the western world flow, administering to the wants and conveniences of the inhabitants on both sides of the Continent, while the population of the valleys, lying between the ranges, will travel north and south to join this great route.

Of the *Coast line*, a few remarks will suffice: it has but few harbours, and most of these, for any advantages they afford, are more dependent on the seasons than the protection they offer. The elevation of the coast is generally high and rugged, has in many places outlying rocks, and may be denominated *iron*-bound.

There are two remarkable inlets, that of San Francisco and the Straits of Juan de Fuca; the first is but thirty-six miles in length, and receives the drainage of the Californian Range. De Fuca Strait separates the Island of Vancouver from Cape Flattery; it is an extensive arm of the sea, running into the Continent for upwards of 100 miles, and then branching to the north and south in many channels; those extending to the north take the character of fiords or canals, and are for the most part deep channels, with wall-sided banks, offering but few ports or anchorages for vessels; while the southern branch forms many fine bays and harbours of great safety and convenience, sufficient to accommodate the commerce of the world.

The coast north of De Fuca Straits, as far as the Russian line, is broken up with islands, having rocky and bold shores with deep indentations, without any harbours, and all intricate and useless.

CHAPTER II.

UPPER CALIFORNIA.

Upper California, or that part which now belongs to the United States, is embraced between the 32d and 42d parallels of north latitude, and between the 109th degree of west longitude and the Pacific Ocean; it contains about 400,000 square miles. Inspection of the map will give a very good idea of the face of the country, and particularly of the extent of its three great divisions, viz.: first, that part east of the Colorado River, about three-tenths; second, that portion occupying the centre, lying between the Colorado and the Californian range of mountains (which is nearly triangular in form), comprising four-

tenths, or about 160,000 square miles; the remaining three-tenths is that portion to which the attention of the whole country has been directed by the late discoveries of the immense quantities of precious metals within its limits; it comprises about 120,000 square miles.

The part east of the Colorado is separated by the Anahuac Range from New Mexico, is bounded on the west by the Colorado, on the north by the Bear Mountains, which divide it from Oregon, and the southern boundary rests upon the Gila. As yet, there has been no scientific exploration of the centre of this portion, but some travellers have passed over and through it; the trappers and residents of Santa Fe (New Mexico) describe it as being entirely occupied by broken mountain ranges, with narrow and confined valleys of little extent, destitute of any arable land that will serve for occupation or settlement.

Dr. Lyman, who passed over this section and down along the Colorado, appears to have seen most of it, from the 38th parallel to its mouth. His description is by no means inviting, and such as to give one the impression that this portion is utterly uninhabitable; he represents it as composed of high table-lands, perfectly barren and utterly destitute of water, with little or no vegetation excepting the wild sage (*Artemesia*); that the traveller is frequently disappointed and tantalized by encountering ponds of water which prove salt, and a scanty supply of coarse vegetation, including the wild squash (fit only to recall his remembrance to the more fertile fields of his own country); and he also states that the water of the Colorado is either brackish or slimy.

North of the 38th parallel it is more broken up by short mountain ranges, in which the small tributaries of the Colorado take their rise, and through which they flow, affording supplies of water and grass (which grow on the narrow alluvial belts along their courses), administering to the wants of both man and beast.

Lieutenant-Colonel Emory, who has explored the country along the Gila with great industry, speaking of this portion says: "In no part of this vast tract can the rains from heaven be relied upon, to any extent, for the cultivation of the soil.

The earth is destitute of trees, and in great part also of any vegetation whatever. A few feeble streams flow, in different directions, from the great mountains which in many places traverse this region. These streams are separated, sometimes by plains, and sometimes by mountains, without water and without vegetation, and may be called deserts, so far as they perform any useful part in the sustenance of animal life. The cultivation of the earth is therefore confined to those narrow strips of land which are within the level of the waters of the streams; and wherever practised, in a community, with any success or to any extent, involves a degree of subordination and absolute obedience to a chief, repugnant to the habits of our people."

As respects the central part, we have many reliable sources to refer to, viz.: the exploring party under Lieut. Col. Fremont, and the travellers Bryant, Farnham, Smith, Dr. Marsh, and others. These all agree as to its general features being those of a semi-desert, and that its northern portion forms a "Great Basin," the extent of which is now ascertained to be 400 miles from east to west, by 250 miles from north to south; being bounded on the south by a range of mountains, between the parallels of 37° and 38° N., extending from the Californian to the Wahsatch Range. From this range there are streams which flow both north and south, the former to lose themselves in the dreary waste, and the latter to unite with the waters of the Colorado. The country lying to the south of it is imperfectly known, but believed to resemble the southern part of the first section, of which Col. Emory's description has been already given.

The northern part, or "Great Basin," is elevated some four or five thousand feet above the level of the sea, having a succession of isolated mountain ranges, some of which rise to the height of six or seven thousand feet above the plains, their general outline being sharp and ragged. The mountains run north and south; the streams which flow within the basin run east and west, emptying into the lakes, or losing themselves in sandy plains. The small rivulets, that have their sources in the mountains which are capped with snow, afford water and some

grass for the most part of the year, but their running waters rarely extend beyond the alluvial deposites at the bases.

The plains of the Great Basin are peculiar, and represented as "frightfully forbidding" and "unearthly" in their aspects, so much so, that even the animals dread entering upon them. One of them, the Great Salt Plain, which is crossed by the route to California, has a snowlike surface, and is so compact and hard on its eastern border, as to show but little impression from the feet of animals passing over it. This snow-white substance is an incrustation of saline and alkaline bodies combined, in thickness from one-fourth to half an inch, beneath which is a stratum of damp whitish sand and clay intermingled; small fragments of "white shelly rock" are strewn over the entire plain, and imbedded in the salt and sand. To the west the soil of the plain becomes softer,—a composition of clay, sand and salt, in which the mules are represented as sinking to their knees; and at times the travelling becomes so difficult and fatiguing to the animals, as almost to prevent their advancing. It is about 40 miles in breadth, and 150 miles in length. Mr. Bryant crossed this plain in August, and to him we owe the above description.

There are several lakes within the area of this basin; among them are the Timponogos, or Great Salt, and the Yutah Lakes, which lie on the east; while on the west we find the Pyramid, Walker, and Carson Lakes, with many other smaller ones in which the mountain streams lose themselves.

The Timponogos or Great Salt Lake has never been accurately surveyed: it is about seventy miles in length and forty to sixty miles in width. There are numerous high islands studding its surface, and many large bays indenting its shores. The water is exceedingly salt and bitter to the taste. Lieutenant-Colonel Frémont gives the constituent parts of the salt obtained by evaporation as,—

Chloride of Sodium	97.80
Chloride of Calcium	0.61
Chloride of Magnesium	0.24
Sulphate of Soda	0.23
Sulphate of Lime	1.12
	100.00

The soil along its shores is in places argil aceous, in others sandy and gravelly; where there is soil, grass, canes, rushes, and a variety of small shrubs and flowering plants grow luxuriantly. On the mountain sides there are a few scrub oaks and stunted cedars, and these are also found on the borders of the small streams which flow from the mountains. The water of these streams is very pure and cold. The Bear River and several other considerable streams empty into the Great Salt Lake from the north and east.

On the south the Yutah River connects it with the Yutah Lake, the waters of which are perfectly fresh; it is about twenty miles long and six miles wide, with numerous tributaries flowing from the Wahsatch mountains, which lie to the eastward. Along the eastern bank of this lake, and on both sides of the Yutah River there is considerable land fit for tillage and pasture. On a part of this a settlement was made by the Mormons in 1847. There are two other lakes to the south-west of Yutah Lake, into one of which the river Severo empties. They resemble in many particulars the Yutah Lake. To the westward of the salt plain already described, there are several short ranges of mountains, that break up the country and give rise to small streams, which afford a scanty supply of water and grass. The longest of these ranges (the Humboldt Mountains) is 150 miles west of the Great Salt Lake. At the northern and southern ends of the Humboldt Range two small streams take their rise, and after running in opposite directions fifty miles, they approach each other, join, and form the Mary's River, which pursues a serpentine course towards the south-west for about 300 miles, and is then lost in a lake or slough. It is described as about thirty or forty feet in width, with steep perpendicular banks, at times deep, at others nearly dry, from having been absorbed by the earth, and is frequently seen only as a line of stagnant pools. The water of the river, as you approach its end, is not drinkable, but as acrid and bitter as the strongest ley.

The "Sink" of Mary's River consists of pools of standing water, covered with a yellowish slime, and emitting a disagreeable odour; these, at times, have the appearance of a lake, some twenty miles in length by six miles in breadth, according to the

season of the year. Around this lake or pool is the usual alluvial deposit, and upon this soil shoot up a short grass and reeds. It is important to take into consideration the season at which the accounts of the "Great Basin" have been written, though all describe it as barren and sterile. Yet it may be crossed at one season more advantageously than at another; and many persons have been able to pass it without much suffering to their animals or themselves, while others have entirely failed to reach their destination, or been obliged to turn back after having endured every privation.

The Pyramid Lake lies fifty miles to the west of the "Sink," this distance is barren and destitute of vegetation, except the wild sage and a few small patches of grass; as you approach the mountains the volcanic appearances increase, the plains are covered with scoriæ, and the mountain ridges are composed of black basaltic rocks. Numerous warm springs, impregnated with salt, sulphur and magnesia, are found on the sides of the mountains. This lake lies at the base of the Californian Range, and here the trees again begin to appear. The Truckee or Salmon Trout River, which falls into this lake, offers a good pass through the mountains at this place. It is reported to be one hundred miles in length, taking its rise in the mountains, and flowing through a finely timbered country, which changes into the barren and rocky region mentioned above, as it approaches the lake. It is seldom more than fifty feet wide, and about two feet deep; the current is rapid, and the water clear; grass in abundance can be obtained along its banks at the season when the mountain passes are practicable.

The ascent of the Californian mountains begins at the Pyramid lake; reddish and brown sand-stone are first met with; then conglomerates, granites, and above all, basalt. The distance to the summit is sixty-five miles; and the higher ridges are covered with a thick growth of timber, principally coniferæ. According to Frémont, the Pass is 7200 feet above the level of the sea.

The descent on the west is down the Bear Creek, a small tributary of the Feather River; and the valley of the Sacramento is reached without difficulty forty miles north of New Helvetia.

This pass is the one generally travelled by emigrants, and

should never be attempted after the middle of October. The sufferings endured by emigrants to California in 1846, ought to prove a salutary caution to those desirous of taking this route late in the season. The time requisite to cross the Great Basin and go through the Emigrant Pass with wagons, is forty-five days, of which thirty-five are required to reach the foot of the mountains or Pyramid Lake.

There is one portion of the Great Basin which still remains to be explored, that to the south and west of Lake Nicollet. There is but little doubt that it is similar to that which has been examined.

The usual route from Santa Fé to California passes diagonally over the southern part of the central section, in a south-west and north-east direction. The traders represent it as a waste of land, with here and there mountains which have streams flowing from them, and losing themselves in the sand or emptying into the Colorado; their banks are lined with willows and cotton-wood trees; but little or no grass; however, is to be obtained. On the eastern border of this sandy desert is "Las Vegas de Santa Clara," a rich mountain valley, ten miles long and one mile wide, abounding with excellent springs and quantities of good grass. This is the halting-place of the traders from California to Santa Fé, and here their animals are recruited after the privations suffered on the march from the Cordilleras of California, a distance of nearly three hundred miles. The difficulties of this route are increased by the dangers of attack from Indians who frequent this route for the purpose of plundering the annual caravan and travellers.

Lieutenant-Colonel Emory describes the route between the Colorado (where the Gila empties) and the Cordilleras as a sandy desert, with but few plants, and entirely destitute of water, which he had to obtain by digging, and even then had not sufficient to supply the wants of his animals.

It remains now to describe the section which lies west of the Californian Range. These mountains extend from the 42d to the 35th degree of north latitude, running nearly parallel to the coast, at the distance of 130 to 150 miles from it, where they join the Coast Range, and under the name of the Cordilleras of California extend to Cape San Lucas, the extreme point

of the Peninsula: these latter mountains with their spurs occupying the narrow belt of sea-coast west of the Colorado River.

The Californian Range rises gradually from the valley, at first in gentle undulating hills, becoming more precipitous, as they ascend, but still not so much so as to prevent access to the highest points beneath the snow line. The distance from the valley to the summit is from sixty-five to seventy miles, and the average altitude 8000 feet. The ascent gives rise to a variety of climates; each belt has its flowers and vegetation: on the undulating hills groves of oaks, next above cedars, and last pines or coniferæ, although there are many other forest trees, those mentioned are the most prominent, and mark the character more particularly; some of the latter are found interspersed with the oaks, especially the Pinus Lambertiani, the range of the Pinus Lambertiani as to altitude being from 2000 feet upwards.

The Coast Range is a collection of rugged mountains, resembling spurs, their direction being generally parallel to the coast. In their whole extent, from latitude 42° N. to the Bay of San Francisco, they offer few places for settlement. They rise to the height of four thousand feet, and towards their northern termination, where they join the Shaste Mountains, reach the snow line. On the eastern side this range declines into rolling hills, while on the coast or western side they present a perpendicular or rocky bound shore, thus reversing the order of the Californian range.

In both these mountain ranges, there are small lakes, lying embosomed in valleys of considerable extent, which afford a plentiful supply of water, and some of the most fertile lands in California are to be found bordering them; the hills throughout the whole range are well timbered, and where trees do not exist, grass and oats grow in great profusion. The climate in these valleys is moist, and well adapted for cultivation; particularly those parts sheltered from the chilling north-west winds of summer.

There is a third range of hills separated by the Sacramento and bay of San Francisco from the Coast Range, which merit attention, extending south from the Straits of Karquines to the distance of 150 miles parallel to the coast, and forty miles from it; these, though of less elevation, exert much influence

over the climate of the country through which they run. With the exception of Mount Diavolo, they do not rise above 1500 or 2000 feet; they join the great Californian Range in lat. 34°. After the rainy season, they are covered with grass and flowers, but not being sufficiently high to attract the moisture, they become burnt up, and in appearance barren during the summer.

CHAPTER III.

SACRAMENTO AND SAN JOACHIN VALLEYS.

The principal features of the western section are its three valleys,—the Sacramento, San Joachin, and San Juan; the two former appear to be a single valley on the map, yet their features are distinct and different in many respects.

The Sacramento Valley extends from 40° 30′ N. to the south 180 miles; comprising within its limits the country from the foot of the Californian Range on the east to the Coast Range on the west; its form is that of an oval, the greatest width being at New Helvetia, where it is fifty miles broad. The whole of this extent is an inclined prairie of alluvial, rising about four feet to the mile, the upper part being 900 feet above the level of the sea; this is divided into two distinct terraces throughout its length, called the upper and lower prairies. The low undulating hills which form the upper prairie, project into the lower prairie to various distances, and give its boundary an irregular outline; the height of this upper prairie above the lower is about sixty feet, the slope varying, and in some instances is quite steep. Through this valley the Sacramento flows, inclining to the east, from which side it receives its principal tributaries; the largest among these is the Rio de las Plumas, or Feather River, which has several mountain streams running into it,—the Yuba, Bear, and Deer.

The Feather River joins the Sacramento fifteen miles above New Helvetia, and ninety miles from the bay of San Francisco; it is 100 miles in length: its course, after reaching the Sacramento valley, is nearly south, and fifty miles from its mouth

dwindles into a mountain stream, taking its rise in the northern part of the Californian range; during the dry season, it is fordable at its mouth, but there are many quicksands, which render it dangerous; the banks are twenty or thirty feet above the usual level, but, like the Sacramento, it overflows during the season of rains.

The American fork joins the Sacramento at New Helvetia, and at its junction is but little more than one hundred feet wide, rapid and shallow; the banks are high and capacious enough to accommodate a large body of water. On this river Captain Suter and several other persons have large farms. The tide is felt up as high as this place, where it rises two or three feet, but no counter-current is produced.

The upper prairie at the head of the Sacramento valley is between two and three hundred feet above the level of the river, and inclines like the lower prairie to the south; its width does not exceed five miles, which is about the average as the valley is descended. Its undulating hills consist of a clayey and sandy loam, gravel and pebbles, while the soil of the lower prairie is rich alluvial; for the formation of these river terraces, a subject which is exceedingly interesting to Geologists, I would refer to Mr. Dana's volume on the Geology of the Exploring Expedition. The southern part of the lower prairie on the west side of the river is covered with oaks, which likewise grow on the upper prairie, and as they approach the mountains, become more dense and are intermingled with other forest trees.

Nearly in the centre of the lower prairie, between the Sacramento and Feather Rivers, stand the Bute Hills, which rise to the height of 1794 feet above the plain, and in diameter some ten miles. The base is nearly on a level with the upper prairie, and the deposit around them resembles that already described. At the time of floods, the waters of the Sacramento reach their foot, and vast numbers of game seek them for safety. They are of volcanic formation.

On the lower prairie are here and there small lakes or ponds, some of which are supplied by streams and others are stagnant. These are surrounded by a thick underwood interwoven with vines, and being sunk many feet below the surface, render it difficult to obtain the water. There are occasional deep and

dry guiches, which are filled by water-courses during the rainy season. Towards the latter part of the dry season (September and October), the lower prairie becomes rent in many places by the continued drought.

The valley of San Joachin is one hundred and forty miles in length and fifty miles in width. Its features, as has already been remarked, are different from those of the Sacramento, its terraces not being so well defined, nor are they of the same character. The lower prairie is almost entirely wanting, yet it has two distinct elevations; the difference in level of these divisions averages forty feet, though in places the rise is almost imperceptible. The soil of the lowest corresponds to that of the upper prairie of the Sacramento, that of the higher terrace is much better.

The river San Joachin passes down the middle of this valley, and from the Californian Range on the east receives all its tributaries, there being no streams flowing into it from the west. The Chintache and Tula lakes, which unite and occupy a basin of some seventy miles in length by eight in width, act as a reservoir to this river, receiving the small mountain streams which flow from the Californian Range and the most southern end of this valley. When these lakes rise they connect with the San Joachin and discharge the surplus water through its channel; the altitude of these lakes above the sea is 1000 feet, making the fall of the river in its descent through the valley equivalent to seven feet to a mile.

In consequence of the San Joachim having no lower prairie to overflow, it has cut itself a deeper channel than the Sacramento, and at low water its banks are some twenty or thirty feet higher than those of that river. During the dry season it derives its waters from the Rio de los Reyes, and its other tributaries, the Auxumenes, Towalumnes, and Stanislaus Rivers; the Cosomes and Mogueles enter the slough near its junction with the Sacramento.

It has been before remarked that the slope of the eastern side of the Californian Range was gradual and easy of ascent, approaching the valley by undulating hills, capable of cultivation, and well covered with timber. The mountain streams enable a large portion of this side to be irrigated. The western

side, on the other hand, is destitute of these advantages, and a short time after the rains, suffer all the effects of drought and excessive heat, being deprived even of the winds from the ocean, which may be occasionally enjoyed by the opposite or eastern side, and is consequently comparatively barren and useless. Time has had little effect upon its rocks, which have undergone but little decomposition. The trees on the west side of the valley are a hardy species of oak, and are very sparsely scattered over the prairie; the ground is almost entirely bare of grasses, and vegetation is only perceived around the pools (like those of the Sacramento).

This valley is principally valuable for its timber, and the cultivation of the grape, which succeeds better than the cereals. The streams afford positions for water-mills; and as such, will be found useful for the timber. The land above the outlet of Chintache Lake is good soil, and covered with extensive groves of timber, the natural grasses are more abundant and the drought less severe; the streams which flow from the head of the valley discharge themselves into the lakes, but they are much smaller than those emptying into the San Joachin: as the Californian Range does not here reach the snow line, this will account for the decrease of water in the lakes during the drought, for the supply at that season does not replace the evaporation.

Both lakes are surrounded by extensive sloughs, the earth being a rich alluvial deposit from the surrounding mountains, is covered with the tula, which here grows to a large size.

This basin is looked upon as one of the most fertile upland districts of California; not that cultivation has as yet been attempted there to prove it, but from the vast quantities of game and animals which resort to it for sustenance; and its climate is suitable for all the productions of both the temperate and the torrid zones.

The valley of San Juan is situated at the south of the Bay of San Francisco; it is but small in extent when compared to the other two; but in soil, climate and productions, it exceeds them both: it lies between the hills before spoken of and the Coast Range, being sixty miles in length, extending beyond the Mission of San Juan, and from fifteen to twenty miles in width; it is apparently a level plain, but ascends gradually towards the

south; the prairie or plain extends to the foot of the high hills on the east, but on the west, it has the undulating hills mentioned while describing the Sacramento valley, but without their irregular outline.

There are many small portions of the country that I have not spoken of particularly, the soil of these is very variable, but where irrigation cannot be carried on, or the situation is not low, there, cultivation is out of the question. The map of California will point out their locality with sufficient exactness.

CHAPTER IV.

CLIMATE—PRODUCTIONS.

The cultivator, in the lower prairies, will have to contend with the floods, which overflow the bottoms and add nothing to the fertility of the soil; but the parts that are exempt from these freshets, and capable of irrigation, yield abundant and extraordinary returns; and will, if properly attended to, render the population at all times free from famine.

The climate, though very salubrious, is by no means favourable for agriculture. The year is divided into two seasons, the wet and the dry; the first continues from December until March, and the latter the remainder of the year. During the wet season, rain falls at times in deluges; but in the dry season, not a drop is looked for or experienced, and drought consequently occurs more or less, annually, sometimes continuing throughout the whole year; between these two seasons the crops suffer much, and it is needless to say that everything not irrigated must be destroyed.

On the Coast Range, the mean temperature in winter is as high as in summer; the latter being, in fact, the most uncomfortable part of the year, owing to the constant prevalence of the north-west winds, which blow with the regularity of a trade wind, and are exceedingly damp and cold.

This prevalence of westerly winds will be made evident by

the following synopsis of the meteorological journal, kept a Sausalito by the Exploring Expedition.

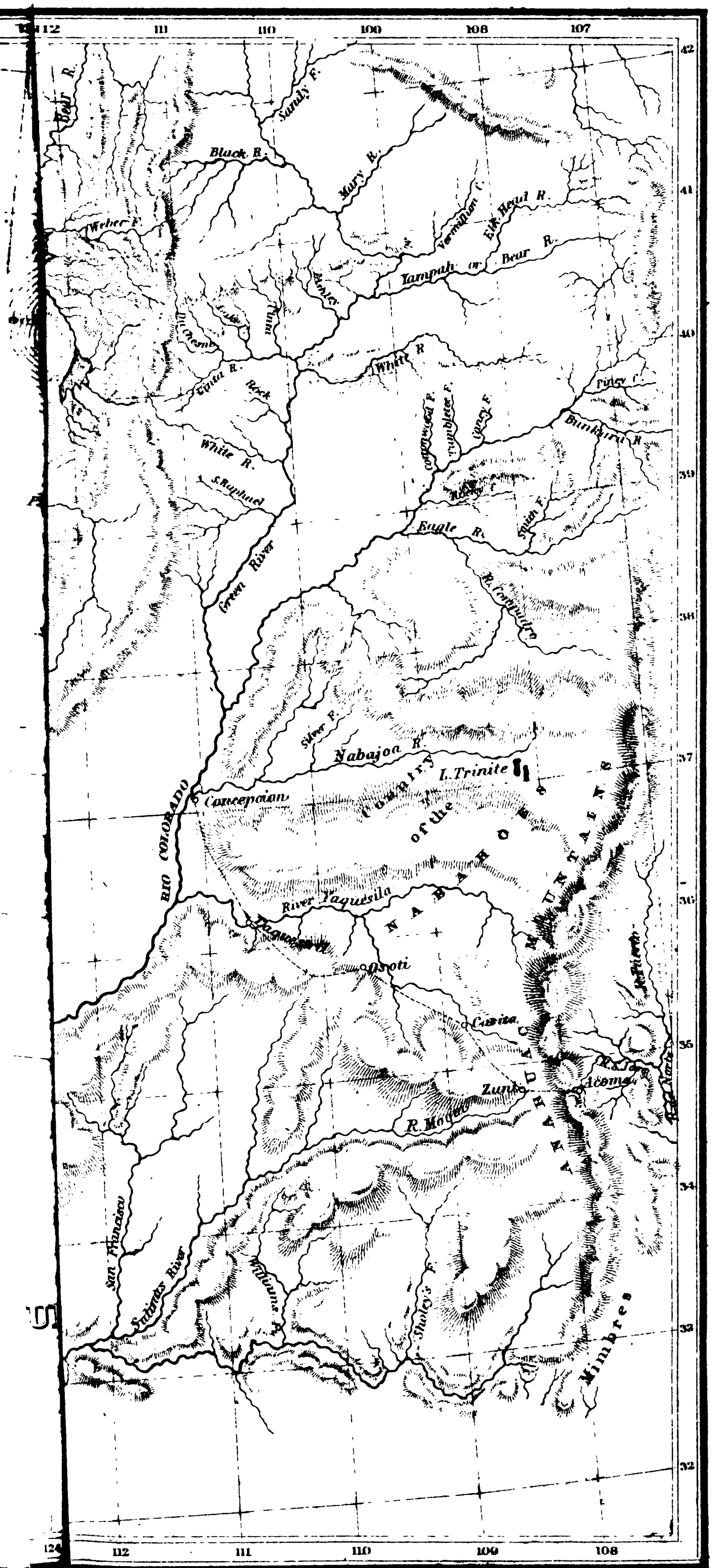
Dir. of Wind.	*No. of Days.*	*Dir. of Wind.*	*No. of Days.*
South-west	44	South-east	5
North-west	18	South	3
West	4	Calm	5
North	1		

These observations were made between August 18th, 1841 and October 31st, a period of seventy-five days, during which time the mean temperature was 61°, the highest point 86°, the lowest, 48°. The temperature at New Helvetia, during the same period, rose as high as 114° in the shade; and this, Captain Suter states, is not unusual.

The climate, thirty miles from the coast, undergoes a great change, and in no part of the world is there to be found a finer or more equable one than in the valley of San Juan. It more resembles that of Andalusia than any other, and none can be more salubrious; the cold winds of the coast have become warmed, and have lost their violence, though they retain their purity.

The valleys of the Sacramento and San Joachin being confined between two ranges of mountains, and not having the same causes operating to modify the temperature as the valley of San Juan, are exceedingly hot during the summer or dry season, the heat continuing without cessation, and the thermometer ranging, it is said, as high as within the torrid zone; this is especially the case with the western part of the San Joachin valley.

It has been stated that rain seldom falls in the Sacramento and San Joachin valleys, or on the Californian mountains, out of the rainy season; in the Great Basin it is also of rare occurrence; the arid and sterile nature of the soil, as well as the few plants that grow in it, prove this conclusively. The cause of this want of rain is undoubtedly due to the altitude of the Coast Range, which abstracts or condenses all the moisture from the sea breezes; and consequently the winds which pass onwards are comparatively free from moisture; an evidence of this is the continual mist or fog hanging over the Coast Range, while



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42
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Bear R.
Sandy F.
Black R.
Mary R.
Vermilion C.
Elk Head R.
Weber F.
Yampah or Bear R.
White R.
Uinta R.
Rock
Piney C.
Bunkara R.
White R.
S. Raphael
Cottonwood F.
Trambletee F.
Coney F.
Eagle R.
Green River
R. Colombiro
Silver F.
Nabajoa R.
L. Trinite
Concepcion
RIO COLORADO
Country of the
NABAHO
River Yaquesila
Oraibi
Zuni
Acoma
R. Moqui
Mimbres
San Francisco
Salinas River
Williams
Shaley's F.
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the Californian mountains appear generally with a clear and well-defined outline; which freedom from clouds is peculiar, not only to this part of this range, but also to the Cascade mountains in Oregon, with the exception of several of the higher peaks, Mounts Baker and Shaste, which have no intermediate ridge to shield them from the ocean winds.

The *Productions* of this western section of California are of course numerous, with the variety of climate and soil it has; these, however, have their limit; and in estimating its value as an agricultural country, reference must be had to the extent of arable land it contains, it is impossible as yet to give any accurate calculation of the quantity; but an approximation may be arrived at. I have endeavoured to do this, and think that it cannot exceed twelve thousand square miles; but this by the usual process of cultivation in this country, viz., irrigation, is capable of extraordinary yield. Wheat produces remarkably. According to the best authorities, eighty bushels have been gathered from one sown, and this with the loss arising from treading out with horses. Indian corn, rye, barley and oats, are also very fruitful, particularly the last, which has been imported, and is now spread over the whole country around the Bay of San Francisco. Vegetables are extensively cultivated, and may be brought to perfection throughout the year.

The grape appears to succeed well, and wine has been made at some of the missions, which is reported to be of good flavour. Fruit trees of all kinds have been introduced, and the olive has been grown with success in the southern portion.

The country is well adapted for raising stock, sheep in particular; the native grasses are in plenty, and very nutritious the whole year round; and the finest wool may be produced. Hogs may be raised to great advantage, the acorns being very abundant on the hills where the land is not suitable for cultivation. Cattle have been raised in great numbers since the first occupation of the country by the Spaniards; and until the last ten years large quantities of hides have been exported.

All the rivers are well stocked with salmon, and a large supply of this fine fish is to be had in the season.

Hitherto the Californians have manufactured but little leather; but under proper management this might be carried on

with profit, the raw material being at hand. Soap could also be made very economically, the necessary alkali being very abundant.

CHAPTER V.

MINERAL WEALTH.

The discovery of large quantities of gold in California has very naturally directed the attention of this country towards its mineral treasures; and the tide of emigration is now setting towards those regions from all quarters of the globe. Many exaggerated statements have been put forth, and it is very natural that it should be so. Still there is every reason to believe that the auriferous deposites exist over a large extent of country.

In the sequel will be found extracts from Mr. Dana's volume on the Geology of the Exploring Expedition, which give a very satisfactory account of the formation of the northern part of the mountain range in which the auriferous deposites have been found. The close resemblance of the talcose and allied rocks of this region to those of other gold-producing countries was noticed and written by this distinguished and accurate observer before the discovery of gold was made; these, it will be seen, extend into Oregon as far as the Umpqua, Shaste, and Sacramento districts, and were traced by Mr. Dana to within forty miles of the "diggings," at which point his examination of the mountain country terminated.

Lieutenant-Colonel Fremont is the only scientific traveller who has passed down the valley of the American Fork, and from him we have but little; the state of his party being such, after passing the mountains, as was calculated to occupy all his attention; and when men are in a starving condition, they can hardly be expected to pay much regard to the formation of the country, which at other times would have claimed a careful examination.

It will be my endeavor to show the connection which exists between the country explored by Mr. Dana and the "diggings,"

by all the facts that have come to us from the gold region. In order that some idea may be formed of the extent as well as the relative positions where the gold has been discovered, I have prepared a map of the Sacramento, based upon the surveys made by the Exploring Expedition, embracing a section of the country from Monterey to above the Prairie Butes, which includes the positions of the "placers" already known. This will at once bring the whole under the eye, and enable a correct estimate to be formed of the country now embraced by them, as well as of the approaches to it by water from Monterey or San Francisco, and what facilities it offers to those who intend to emigrate.

From official accounts we learn that the gold was first detected on the American Fork, about forty miles above Suter's Fort (now called New Helvetia), and fifteen hundred or two thousand feet above the level of the sea. The distance of the "lower washings" from New Helvetia, according to Colonel Mason, is twenty-five miles. The hills, in which the "diggings" are made, are composed of a clayey and slatey formation, overgrown with pinus lambertiani of large size. For the convenience of sawing the trees, the mill was erected that led to the discovery of the precious metal. These hills form the first rise of the California Range, and extend about twelve miles to the eastward. Other positions where the gold has been found, lead to the belief that the same formation continues about the same heighth, from the Stanislaus River on the south, to the Feather River on the north, a distance of 150 miles, and covering an area of about 1800 square miles, throughout which gold has been already discovered; and thence, if geological facts are to be taken as a basis, extends farther to the north.

The gold is found, in its virgin state, disseminated in small particles, in three distinct deposites: 1st, in sand and gravel beds; 2d, among decomposed granite; and, 3d, intermixed with talcose slate. These rocks are soft and friable, and with them the gold is believed to be combined. In the vicinity of these placers the streams flow over coarse slate and shale standing vertically, and between the layers of these rocks the gold is found deposited; the largest pieces are found near and in the talcose slate rocks, but the finer particles and scales have been

carried down by the streams to the lowest part of the valleys, where they are mixed with sand on the surface and to the depth of four or five feet.

No gold has been found in the *matrix*, neither is it yet known what that matrix is; but it is probable that it does not differ from that common to all gold regions. The rocks in California most likely to afford gold, in the opinion of Mr. Dana, are of more or less slaty structure, being either talcose, chloritic, or micaceous slates, or argillitic, containing white quartz in interlaminations and beds, and also in large and small veins: he believes that the pudding-stones composed of pebbles of quartz, flint, jasper, and others from talcose and prasoid rocks, contain the most gold.

From the information we have, it is probable that the gold-bearing rocks are those described by Mr. Dana; and the following facts lead to that belief:—1st, That the clayey and slaty formation has been traced north as far as 40°, in the neighborhood of which Mr. Dana reports he found them, and that these rocks have the same dip. 2d. That the altitude where the gold diggings are is the same as that in which Mr. Dana saw these rocks, may be inferred from the fact of the growth of the Pinus Lambertiani over the same strata.

From the nature of the deposite in which the gold is now found, and the fact that the streams are quite clear, and do not carry alluvial with them at the present time, it may be inferred that they are of ancient date, and that the disintegrating process is not going on rapidly. The specimens of gold sent from California strengthen this opinion. They all exhibit a fused appearance; some have pebbles of quartz embedded in them, and some are amalgamated. These latter are about the size of duck-shot, proving incontestably the presence of liquid mercury in the deposite, occasioned, no doubt, by the reduction of its ore by heat; which fact alone would point back to a period when this range was undergoing volcanic action.

Various reports have reached us of the discoveries in the gold regions; but unless these are well authenticated, the public should beware of giving credence to them. There is no doubt, however, of the presence of great quantities of minerals in the Coast range, of which many mines have already been opened.

We refer to those of *cinnabar*, near San Juan, and the *lead* mines at Sonoma. The other metals are platinum, silver, copper, iron, and tin. Sulphur is also said to exist in large quantities.

CHAPTER VI.

HARBOURS—CALIFORNIA.

To enable a true estimate of this country to be formed, it is necessary to give some account of its harbours; these are not numerous on the coast of California.

The best, and indeed the only harbours in this territory, are San Diego, San Francisco, and Bodega; there are besides several roadsteads, which have been used as anchorages during the fine season (from March to October), viz: the Bays of Monterey, San Pedro, and Santa Barbara.

The Port of San Diego is the most southern in the territory of the United States, and is of considerable extent, being in fact an arm of the sea; in length ten miles, and in width four miles; from being land-locked it is perfectly secure from all winds. The entrance is narrow and easily defended, and has a sufficient depth of water, twenty feet at lowest tide, for large vessels. The tide rises five feet. The tongue of Kelp, three miles long by a quarter of a mile broad, off the entrance of the bay, must be avoided by large vessels, but small vessels may pass through it with a strong breeze; the bank has three fathoms water on it. During gales, this Kelp is torn up and driven into the bay, where it becomes troublesome to vessels by the pressure it brings upon them, either causing them to drag their anchors or part their cables.

There are many drawbacks to this harbour; the want of water is one of them, the river which furnishes the mission with water disappearing in the dry season before reaching the bay, and the surrounding country may be called a barren waste of sand hills. The town of San Diego, consisting of a few adobe houses, is situated on the north side of the bay on a sand flat two miles

wide. The mission establishment is seven miles from the town, up a valley to the north-east; and here, there is a good supply of water the year round. This river in the rainy season, discharges a considerable quantity of water into the bay, bringing with it much sand, which has already formed a bar across a part of False Bay, rendering it useless, and well grounded fears may be entertained that it will eventually destroy this harbour also: this occurrence, however, may be prevented at slight cost.

The whole country around San Diego is composed of volcanic sand and mud mixed with scoria: the land is unfit for cultivation, and covered with cacti, one of the many evidences of the poorness of the soil; this leaves the Port of San Diego little to recommend it but the uniform climate, good anchorage and security from all winds.

San Diego lies in latitude 32° 40′ N., and longitude 117° 11′ W.

The Bay of San Juan is forty-five miles north of San Diego: at its head lies the fertile valley, in which is situated the town and mission of San Juan. The Bay is entirely unprotected and is a bad roadstead, the bottom being very foul inside of five fathoms, and the landing at times impossible on account of the surf. It can be safely visited during the fine season, and provisions and water easily obtained, the latter from the mountain streams, which empty into the bay, and also enable the inhabitants to irrigate their lands, by which mode of cultivation they are made extremely productive. The shore here becomes quite bold, making the communication very inconvenient to the northward by land.

From San Juan the coast trends west-north-west thirty-seven miles to San Pedro, which is but an open bay with scarcely any more claims to be called a harbour than San Juan: it is equally exposed except from the northwest winds; but, from being near a part of the country which produced an abundance of what was formerly the staple of the country, hides, it was more frequently visited. The town of Nuestra Señora is eighteen miles from the bay up the valley.

The cliffs along this part of the coast are steep, and composed of clay and chert, throughout which is interspersed chalky lumps, which contain organic remains. Water is not to be obtained here, and the little that is required for the supply

of a few inhabitants has to be brought from a distance in the interior.

Point Conception lies one hundred and ten miles west-north-west from Point San Pedro: off this part of the coast there are several islands, viz: Santa Cruz, Santa Rosa, and San Miguel, St. Nicholas, Santa Catalina, Santa Clementina, and Santa Barbara, on which many sea-otter have been taken. The passage between these islands and the coast is called Santa Barbara.

Santa Barbara lies thirty five miles east by south from Point Conception. There is scarcely any protection, though somewhat sheltered from the north-west swell by the island of Santa Cruz: vessels however anchor here, notwithstanding the south-east winds blow during the winter months with great violence. At these times it is necessary for vessels to put to sea, and this is usually done when indications of these storms are seen. There is anchorage within the line of kelp in five fathoms water, but it is only resorted to by navigators who are very desirous of discharging or getting on board their cargoes.

The town is within a few hundred yards of the beach, from which the valley rises in which the mission of Santa Barbara is situated. The mission, with its white-washed walls, forms an excellent land-mark for the anchorage, and all dangers may be avoided by keeping without the line of kelp, which is found to grow on this coast in from five to seven fathoms water.

Santa Barbara has been the residence of the best families in California: it is larger than Monterey, and contains nearly one thousand inhabitants; its position seems to be badly chosen, except as to climate, which combines all the good points of the other ports on the coast, being drier than those towards the north, and cooler than those of the south. The anchorage is bad holding ground, being hard sand covered with sea-weed.

Excellent water, and in plenty, is obtained from the rocky hills four or five miles distant, which enables cultivation by irrigation to be carried on, and by this means all kinds of fruit and grains are brought to perfection, and some of the former made to produce throughout the year; flowers, common to our gardens, also bloom in the winter months. This fertile valley extends back seventeen miles.

San Gabriel and the Pueblo de los Angelos, two of the prin-

cipal towns, lie in this part of California, deemed the most agreeable climate in the country.

These towns have always been the centre of the Spanish population; but under the recent changes, they will lose their importance, yet continue, no doubt, to be occupied as heretofore, exclusively by Californians and their descendants.

The currents off Point Conception set to the north in the early spring months; off this point there is noticed a scent, resembling that of asphaltum: this is mentioned by Vancouver, and by several others: being observed at such long intervals, it is reasonable to suppose that the cause is of a permanent nature. As this part of the coast is frequently enveloped in fog, this smell may be a good notification of the vicinity of the land to the navigator.

The land from point Conception trends north, and the climate at this cape seems to undergo as great a change as the direction of the coast: to the northward fogs and mists prevail during the early part of the day for three-fourths of the year.

San Louis Obispo is forty miles to the north of Point Conception: immediately in the rear are the Santa Lucia hills, a part of the Coast Range, extending as far north as Punto Pinos, the southern point of the Bay of Monterey. The plains and neighbouring mountains are well covered with large timber, and here the olive and other fruits of this region grow in perfection; on the hills the Californian cedar (pale colorado) is found of large size. A small stream, the Rio San Felipe, empties into the sea at this point.

On the opposite or eastern slope of the ridge is the valley of Salinas, through which the Rio Buenaventura flows. The hills are rendered much more fertile by their exposure to the fogs and mists of the coast, which supply them plentifully with moisture, and this is seen running in many rills down the hillsides.

The valley of Salinas is fifty miles in length, and has an average width of six or seven miles; the valley descends to the north-west, and at its lower end is contracted by the hills through which the river passes, a low and well-wooded bottom being formed on each side; the whole of it is well drained, and admirably adapted for stock farms; it may be called an open

country covered with grass; the tops of the hills are covered with oaks, pines, and cedars.

The river having passed through a narrow range of hills, the valley again opens and now receives the name of La Soledad, which is twenty miles wide, and extends to the bay of Monterey. The land on either side rises into undulating hills, and from these into mountains, some 2000 feet high. The valley of La Soledad is considered very fertile, the plains affording large areas of arable land, while the hills are covered with grass and groves of oak, and the mountains with trees of higher growth.

Point Pinos is 100 miles north-west by north of San Luis Obispo; the Santa Lucia Range still continues to rise, until it reaches the altitude of 2700 feet in the rear of Point Pinos; they are thickly wooded, and generally have, from the trees being for the most part pines, a sombre appearance.

The town of Monterey is fast rising into importance, and is generally resorted to by vessels visiting the coast, as supplies can be obtained in plenty. The bay is a segment of a circle, eighteen miles in length, extending from Point Anno Nuevo on the north to Point Pinos on the south.

The roadstead of Monterey is at the south end of the bay, and is considered a safe anchorage, though but partially protected from the westerly winds by Point Pinos. The points of the coast which form the bay and the land a short distance back are all elevated, but the beach is sandy, and has a continual surf beating upon it, which may be heard for some distance. There are no hidden dangers in the bay; those that exist are visible, or have kelp growing on them, which points out their position; they all lie near the shore. The bottom at the anchorage is sand and stones, but in places rocky; to the north the water deepens, and the soundings are yellowish mud, mixed with sand. The tides are regular, but not felt at the usual anchorage, the current flowing inside and around the bay.

The ordinary winds at this place are from the south-west and west-south-west in the morning; towards ten o'clock it veers to the west and west-north-west, from which quarter it freshens till three or four o'clock, afterwards decreasing, and finally becomes calm, which lasts until midnight, when light

airs come off from the land, which continue until daylight. In November there are frequent short gales from the south-east, which blow from off the high land, rushing down in violent squalls. The most dangerous gales are from the north and west, on which side the bay is completely open; the sea sets in very heavy, and is more to be apprehended than the wind. Fogs generally prevail in the morning to seaward; these, however, do not extend into the bay, and when the wind from the north-west sets in they are generally dissipated.

From Point Anño Nuevo to the entrance of San Francisco is fifty-three miles. The coast for the whole distance is uninviting in appearance; the San Bruno hills gradually decrease in altitude, and become sandy and barren, without any symptoms of cultivation.

On the north side of the entrance to San Francisco is Table Hill, and from this point the shore trends west-north-west as far as Punta de los Reyes.

The bar, as it has been termed, lies on the north, and is four miles outside. The least depth of water is four-and-a-half fathoms, but it is at times very dangerous on account of the heavy breakers. It can be avoided by keeping the southern shore aboard, where deeper water is found. At the time of new and full moon a swell sets in upon this coast, and causes heavy and remarkable breakers. These were experienced by the Vincennes, in 1841. While standing out from San Francisco, the wind died away and she was obliged to anchor in seven fathoms; but a few hours after this a heavy swell arose, apparently without cause, and in a short time she was riding in the midst of breakers, many of which broke over and swept her decks, rendering her situation very precarious for several hours. Vessels, at these times, should avoid leaving the bay of San Francisco without a sufficient breeze to carry them to sea or beyond the influence of the breakers. If becalmed, vessels may anchor in twelve fathoms water with perfect safety.

The entrance to the bay is very striking, bold, and rocky; a mile wide and three miles in length, with deep water and no obstructions. It then expands into an extensive bay, in which lie several islands; that of San Angelo is the largest and

highest, and covered with vegetation to its very top. The next in size are Yerba Buena and Alcantras. The smaller ones are covered with guano, over which an immense number of sea-fowl are seen hovering. The shores of the bay extend north and south beyond the visible horizon; to the east is the Coast range, and beyond rise the lofty Californian mountains, brilliant with all the beautiful tints that the atmosphere in this climate gives.

The Bay of San Francisco is thirty-six miles in length by an average of six in width; a large portion of its southern, eastern, and northern shores are bordered by extensive and wide mud-flats, preventing the landing, at low water, of even a boat; so much so that the eastern shore may be said to be inaccessible for a distance of thirty miles; and this impediment prevents it from ever becoming useful, except by the construction of extensive artificial works. On the north it is bounded by the Straits of San Pablo, which divide it from the bay of that name.

The Bay of San Pablo is nearly circular, about ten miles in diameter, the larger segment of which is a mud-flat, with but a few feet of water over it; this renders its shore on the western side quite inaccessible. On the east side lies the channel, with a sufficient depth of water for large vessels, leading to the Straits of Karquines, at the mouth of the Sacramento River.

On the western side of the Bay of San Francisco, from the Straits of San Pablo, for a distance of fifteen miles, the country is broken and mountainous, and the shores rocky and indented by small bays, which are useless.

These obstructions reduce this extensive bay very much in size, and it becomes still more so when the safety and convenience of vessels is taken into consideration; indeed, with the deep water, cross tides, and exposed situations, there are but two safe anchorages, viz: Yerba Buena and Sausalito. The former lies on the south of the entrance, between the island and town of the same name, and is of but small extent, with mud-flats, bare at low water, to the channel; it is also very much exposed to the prevailing winds, which blow at times with great violence. It is the usual but by no means the best anchorage, and has but a scanty supply of water, not sufficient

for the population of the town, or the vessels that frequent it; this, added to the rocky point on which the town is situated, will prevent it from ever becoming the seat of trade. The population of the town exceeds five hundred inhabitants; and, from its being nearer to the gold mines than Monterey, has become of late the most frequented.

Sausalito, or Whaler's Harbour, is on the north side of the entrance, under Table Hill, which protects vessels from the prevailing westerly winds. This anchorage is the principal resort of whalers. Here they can obtain wood and water, and refit. The water in the summer is obtained from small springs. The extent of land around this bay is limited to a few acres, the hills rising precipitately, and the high spurs cutting off communication with the country adjoining it.

From Yerba Buena, the distance to the mouth of the bay of San Pablo is ten miles, the course north by west, passing to the right of San Angelos Island, and to the left of Molate. The points San Pedro and San Pablo, which form the mouth of the bay, are two miles asunder.

The channel to the Strait of Karquines is on the east side of the bay of San Pablo. It has not less than four and a half fathoms water, and is a mile wide.

The Strait of Karquines, through which the river Sacramento discharges its waters, runs nearly east and west for the distance of eight miles, and at its narrowest point is half a mile wide, with very deep water—from twelve to seventeen fathoms. The banks on both sides are high, and composed of sandstone. The Napa Creek empties into the straits from the north, about a mile from the bay of San Pablo. It affords fresh water.

Passing through Karquines Straits, the bay of Sooson is entered. It extends eleven miles to the north-east, and is two miles wide. Sooson Creek flows into it on the west, and on the east it receives the waters of the Sacramento and its tributaries. Sooson Bay is not deep, and the greater part of it to the north-east has only sufficient water to float boats.

The channels through the Delta of the Sacramento are narrow, and pass into each other, forming islands. These cover an area of twenty-five square miles, which is entirely overgrown with Tula (Scirpus lacustris). The true channel of the river

lies through the south branch, its direction being due east. It has sufficient water for vessels not drawing over twelve feet. Eleven miles from Sooson Bay, the course of the river changes to the north for two miles. At this point the left-hand channel must be taken, as it is the one leading to the Sacramento proper, the right one leading to Marsh's Landing and the San Joachin. In proceeding up the Sacramento, the river gradually changes its course to the north, with several considerable bends; and at the low stage of water is navigable as far as New Helvetia (Captain Suter's), at the mouth of the American Fork, a distance of fifty miles above where its deltas discharge into Sooson Bay, and, by the water communication, eighty miles from Yerba Buena. Three and a half miles above the American Fork, sand-banks are encountered. These intercept the navigation during the dry season, and are met with as far as the mouth of the Feather River, across which there is a bar and ford, but it is partly quicksand. Above the Feather River, the Sacramento changes its character, becoming very tortuous, as may be seen by an inspection of the map. During the annual freshets, these rivers would afford good opportunities for the transportation of timber from the upper country, where it is found of large dimensions, and in great abundance.

The branch leading to the mouth of the San Joachin is ten miles long, and is navigable for vessels to that place. The San Joachin can only be ascended in boats, and with these but a few miles in the dry season; in the season of the rains, the country for several miles around its mouth is overflowed, and when not under water, is a large marsh.

The Bay of San Francisco is well adapted for a naval depôt, or a place for our whalers to recruit at. Its possession insures us the command of the Northern Pacific, and the protection of our large and extended interests there; but I know of no place where a natural site for a town can be found throughout the whole bay; and it appears to me extremely difficult to select one where the locality would permit of extensive artificial improvements.

The port of Bodega is ninety miles north of San Francisco. It is both small and inconvenient, and cannot be entered, except by vessels of a light draught of water: the anchorage outside is

rocky and dangerous. The Russians occupied this position some years ago; and at Ross, thirty miles to the northward, they had a large farming establishment, where they cultivated grain for their northern posts. Water can be obtained here in much greater quantities than at Yerba Buena or Sausalito.

CHAPTER VII.

OREGON.

In my previous account of Oregon, I divided it into three belts of country; and although I have obtained a much more definite outline since its publication, these three divisions still seem to be proper. They are the *western*, between the Pacific Ocean and Cascade Mountains; the *middle* section, between the Cascade Range and the Blue Mountains; and the *eastern*, between the Blue and the Rocky Mountains.

The first, or *western* section, is much the smallest, but by far the most valuable and important, comprising as it does the greater proportion of the arable land, or that fit for cultivation, and enjoying a climate every way suited to the productions that are the objects of man's labour for his sustenance. It extends from De Fuca's Straits to the parallel of 42° N., a distance of four hundred miles, with an average width of one hundred and twenty miles. It is well covered with timber from the slope of the mountains to the sea, with many fertile valleys and prairies that are well watered; though with the exception of the Columbia and Willamette, the rivers are not navigable. The inlets on the south leading from De Fuca's Straits offer many fine harbours which will be described hereafter. The principal value of this section is its adaptation for agricultural purposes. The Coast Range of mountains gives it a rough appearance, particularly that portion of it which forms the peninsula of Cape Flattery. Mount Olympus is the highest peak, and rises to the elevation of 8197 feet. With the exception of the Columbia, all the rivers which flow through this section have their sources in the Cascade Mountains. Those to the south flow directly towards the

sea; those of the middle run both north and south, and are tributary to the Columbia; while the more northern ones discharge themselves into Puget Sound and Admiralty Inlet. They are all rapid and small streams, having great fall, and many of them offer mill-sites of some extent.

The most fruitful portions of this section are the valleys through which the Willamette and Umpqua flow; particularly the latter. As has been before stated, the only place which affords facilities of communication with the other sections, is the pass of the Columbia through the Cascade Range. There are other points where the mountains are said to be accessible; one at the head of the Mackenzie's River, and another on the north of Mount Rainier on the Pugallup, striking the head waters of the Spipen in the middle section; but neither of these can be considered as more than Indian trails, and only passable from June to October. There are also passes on both sides of Mount Hood, through which settlers have driven their cattle.

The middle section extends the whole length of Oregon from the 42d to the 49th parallel, and is one hundred and sixty miles in breadth. It may be characterized as a pastoral more than an agricultural country. The Columbia passes through it, and receives all the rivers which flow from the north and south. The principal ones on the south are the Falls or Chutes, the John Day, and Umatilla; farther to the south and east are the Malheur, Owyhee, Powder and Burnt Rivers, which fall into the Great South Branch or Snake River.

Towards the south, the country rises, and becomes much broken up by short and steep mountain ranges, which encompass lakes into which flow small streams. Among these lakes are the Klamet, whose outlet is by the river of the same name, which discharges itself into the Pacific Ocean, and Lake Sylanillus, from which issues the Malheur River. To the south of the latter lake runs a range which unites with the Cascade Mountains near the head-waters of the Umpqua River. This range separates the wooded country from the sterile land which joins and forms part of the Great Basin of California. Beyond it the country is uninhabitable except in a very few places around the shores of the small lakes; and even there sufficient ground can seldom be found for camping a large party.

The extent of wooded country, in the middle section of Oregon, may be estimated with some degree of accuracy at 25,000 square miles, and occupies generally that part south of the Columbia; the Blue Mountains proper are also well covered with trees to the Snake River in the eastern section; and though rising in many places above four thousand feet, they have a fertile soil which is fit for cultivation.

The part north of the river is mostly an open prairie country, with several streams running into Columbia on the west from the Cascade Mountains; these are the Yakima, Pischous, and Entecatecome Rivers. The high prairie on the east of the Columbia has a few small lakes near its centre, which have outlets on the north into the Spokane, in which direction the country seems to fall, though the descent of the waters of the Columbia would lead to a different conclusion. This prairie country is covered with the native grasses, but is destitute of timber, except along the streams and its borders on the east.

The extreme northern portion of this section is occupied by a great number of rivers which enter the Columbia, the largest of these is the Okonagan; the country now again becomes timbered and will be able to supply the prairie land above spoken of with timber; from its broken character it can never be cultivated, but after its timber has been removed it will offer desirable positions for stock farms.

The third or eastern section extends from 42° to 53° N. and has an average width of 150 miles. It is volcanic in character, being rough and uneven, and traversed in all directions by spurs and transverse ridges between the two ranges which form its boundaries. There is no portion of the globe of equal extent to be found, where the rivers are so diversified or their courses so opposite to the usual flow of streams; these are all either the main sources of the Columbia or its tributaries, which in places expand into lakes surrounded in many cases by high and perpendicular mountains.

The peculiar character of the rivers of Oregon is more remarkable in this part, than in any other section, they flow here in many cases from five to fifteen hundred feet below the level of the surface, passing sometimes through cañons for many miles, which prevents the water from being reached.

The country may be divided into woodland and barren. Sal-

mon River being the line of separation; on the north lies the forest, on the south volcanic mountains and plains.

Cultivation in this section has not yet been attempted, except in the neighbourhood of Fort Hall, which lies in the southern division, and there with but little success even in the valleys; the northern part is thought to be unfit for agricultural purposes in consequence of the proximity of the snowy mountains, which render the climate so changeable, as to prevent the crops from maturing; it is, however, reported to be well adapted in many places for grazing, and it is said that the stock can even provide themselves with food during the winter months.

It appears necessary in speaking of Western America, that the northern portion or New Caledonia, now belonging to Great Britian, should claim a short description. The boundary line between it and Oregon (49° N. Lat.) strikes the Gulf of Georgia at Point Roberts, five miles south of the mouth of Frazer's River, thence passes through the Canal de Arro, until it intersects De Fuca's Straits, and then west to the Pacific Ocean.

It comprises about 9000 square miles, and is divided into two parts by the Cascade Mountains. The eastern half is drained by Frazer's River and its tributaries, many of which have their rise in lakes covering a large area, but having only a few feet water, so that many are not navigable even for canoes. The soil is not susceptible of cultivation, on account of the severity of the climate, produced in a great measure by the neighbouring snowy mountains; it is well covered with timber, and this in time will become valuable, the transportation being easy to the sea coast by the aid of its numerous streams. The western section includes a small portion of the main land, and the numerous islands on its coast, among which are those of Vancouver and Queen Charlotte; this section as well as the eastern half is well timbered and resembles it in other respects. The climate of Vancouver's Island is much milder than that of the main land, and is believed to offer great inducements for settlers. Coal exists on Vancouver's Island and in Broughton's Archipelago, from the cropings out the deposite is of some extent, it is bituminous and of a good quality. It has been highly approved of by the Hudson Bay Company, who have used it in their steamers and for smithing.

CHAPTER VIII.

RIVERS—OREGON.

The Columbia River and its valley is by far the most interesting and important part of Oregon, not only on account of the variety of soil, productions, and climate, but also from its being the great and only line of communication between the sea coast and the interior. The river is 750 miles long; that portion in the western section is 120 miles in length, and from three to five miles in width, it is navigable as far as the Cascades, during its lowest stages, for vessels not drawing more than twelve feet water. The tides rise and fall above Vancouver eighty miles from its mouth, but they cause no change of current beyond Oak Point; during the freshets the Columbia rises at Vancouver nineteen feet above the low water mark.

The Cowlitz discharges itself from the north, having its source in the Cascade Mountains, and is only navigable for boats during the spring and fall months. The lands on its banks (which are high) are fertile, and here a settlement has been made by the Hudson Bay company. The Willamette enters from the south, thirty miles above the Cowlitz; a particular description of its valley, &c., will be given hereafter.

The valley of the Columbia, as high as the Cascades, is divided into a high and low praries, the latter are not suitable for cultivation, on account of being overflown by the annual freshets; but they are admirably adapted for grazing-lands. The soil of the upper, or high prairie, is light and gravelly; it is well covered with pines, arbutus, oaks, ash and maples; and the hills that border it are generally volcanic. In passing up the river several low islands are met with; the soil on them is of the same character as the lower prairie; they are bordered by a thick growth of trees, cottonwood, ash, &c.

Vancouver is situated on the north bank of the river, and was formerly the head-quarters of the Hudson Bay Company: here they had large dairies, and six miles above are their grist and saw-mills.

The passage of the Columbia through the Cascade Range extends for two miles, and the river has a fall in that distance of forty feet, rendering it impassable for boats; and a portage of two and a half miles has to be made: the width is here reduced to four hundred and fifty yards, and the whole body of water rushes through with great velocity, causing high waves and whirlpools.

The country through which the Columbia passes, in the middle section, is volcanic and barren, with the exception of a few small tracts at the mouths of the rivers which empty into it (the best of these is near the Dalles, and has been occupied by a Methodist mission); the Cascade Range may therefore be termed the eastern boundary of tillable land.

Between the Cascades and Dalles, a distance of forty miles, the river runs nearly west, with but little current; and its banks are formed of nearly perpendicular rocks, like the walls of a crater; this whole distance is navigable, and the passage up is easily made by the aid of the strong westerly winds, which blow nearly every day.

The sand on the banks just below the Dalles, first begins to be movable, and is drifted into hills, &c., every day.

At the Dalles, the river is compressed into a narrow channel, 300 feet wide and half a mile long, between high basaltic rocks, flat on the top: the river descends fifty feet in two miles. The Dalles is situated in an amphitheatre, extending several miles to the north-west, which is enclosed by basaltic walls. Within this space is the tract before mentioned as occupied by the Methodist mission. The freshets cause a rise of sixty-two feet at this place. The country to the north of the river is of little value, being volcanic, and cut up by spurs from the Cascade Range. Though not precipitous, they are dry, and gradually rise as they recede from the river. On the south the land is undulating and covered with timber, has a better soil, and is less subject to droughts.

The perpendicular banks, mentioned below the Dalles, continue for thirty miles above; they then become low, and are composed of volcanic sand, destitute of vegetation. It is from the character of this portion that the whole country has been called barren. No streams of any consequence enter the Columbia

from the north, between the Cascades and Fort Wallawalla, a distance of 150 miles.

At Wallawalla the river changes its course, as will be seen on inspecting the map; and the country on both sides, for sixty miles, is entirely destitute of verdure, being covered with water-worn pebbles. This is the most barren part of Oregon, and covers an area of 600 square miles. The Saptin or Lewis River, the great south branch, enters fifteen miles above the fort, and will be spoken of in the sequel. The Yakima joins the Columbia from the west, five miles above the mouth of the Saptin, taking its rise in the spurs of the Cascade Mountains. Near its head-waters is a small valley of good meadow land, but destitute of timber; and some places may be found, along its course, suitable for farms.

The Pischous valley joins that of the Columbia, 100 miles above the Yakima: it is well watered and fertile. The same remarks will apply to the country through which the Catecome and Barrier Rivers flow.

The banks of the Columbia, between Wallawalla and Okonagan, continue high: the river has many bends, and three principal rapids, the Priest's, Buckland, and Ross; these, however, do not prevent the navigation by boats.

Fort Okonagan is situated at the junction of the river of the same name with the Columbia; and here the latter again changes its direction for fifty miles, and the banks become wooded; but the tillable land is still confined to the valleys, among which may be mentioned the Grand Coulée and the Spokane. The former contains some excellent land. It is five miles wide and sixty miles long, joining the Columbia below, at the Buckland Rapids. The latter lies along the river of the same name. The valley at this point again turns to the north, until the river receives the waters of the Kootanie or Flat Bow. Ten miles below its junction, the Flathead or Clarke's River enters the Columbia. Just below the Flathead, the Kettle Falls and Thompson's Rapids interrupt the navigation; and on the east bank, Fort Colville is situated. This point is 2200 feet above the sea.

At the Kettle Falls, the river passes over a tabular bed of quartz, which has suffered less abrasion than the rocks either

above or below. The total descent is fifty feet; but in no place does it fall perpendicularly more than fifteen. The river is here a third of a mile wide. The land in this neighbourhood is superior, for cultivation, to any on the upper waters of the Columbia.

Above the Flat Bow, the river expands into a succession of lakes, and reaches the latitude of 52° N., where the navigation is again interrupted by the "Dalles de Mort." From Fort Colville to the southern lake, the country is covered with dense forests of pine and spruce. The northern shore is rather low, but the southern is high and rocky. The lower or southern lake is thirty-five miles in length, and four or five in breadth. Its shores are bold, and covered with a heavy growth of timber. The passage between the lower and upper lakes is called "the Straits:" they are narrow and rocky, and from four to five miles in length. The river has at this place a current "swift, whirling, and difficult to stem." The upper lakes are not so large as the lower, and are very similar in character. Thirty miles after leaving the northern lake, the Dalles de Mort is reached; and this is considered as the head of boat navigation, being the place where the trappers leave their boats to pass over the Rocky Mountains. The valley now turns to the south-east; and after a distance of 150 miles, through a country similar to that around the lakes spoken of, where the head-waters of this great river of the west take their rise, are found two small lakes. What is very remarkable about this portion is, that the Kootanie, which is a tributary of the Columbia, pursues nearly an opposite course for 300 miles, passing within a few miles of the lakes in which the main river has its rise.

The Flathead or Clarke's River discharges as large a volume of water as that part of the Columbia above the junction. It falls into the Columbia over a confused heap of large rocks. One hundred miles from its mouth the river expands into Lake Kullespelm, which is thirty-six miles long and eight wide. The country around is rich and beautiful, stretching to the feet of the snowy mountains which surround it. The land both above and below is covered with pines and spruces, with occasional spots of rich bottom land. Fifty miles above this lake the river is formed by two forks; the southern one has its

sources in the Rocky Mountains, near the "Grand Defile," the northern taking its rise in the Flathead Lake.

The Spokane River rises in the spurs of the Rocky Mountains, runs in a north-west direction two hundred miles, when it empties into the Columbia. About one hundred miles from its mouth it expands and forms Lake Cœur d'Alene, twenty-five miles in length and ten miles in width, around which is land suitable for grazing purposes. Between the lake and the Columbia there are many spots which could be cultivated with advantage, but the whole valley is better adapted for stock farms.

Okonagan River is the largest branch of the Columbia on the north. It originates in a lake of the same name. The land along its banks is mostly worthless, but near its junction with the Columbia are some prairies well covered with grass.

The Great South Branch of the Columbia or Saptin takes its rise in the northern part of the Wind River Mountains, near the Three Tetons, and from thence to Fort Hall follows a south-westerly course. Fort Hall is situated on the south bank, in latitude 43° 4′ N., on a low rich bottom fifteen miles in length, formed by the confluence of the Portneuf and Saptin. The country to the north of Fort Hall is a level plain extending to the Salmon River Mountains, a distance of eighty miles. This vast plain is covered with wild sage. The Three Butes rise in the centre of this plain, and are distinctly visible at the Fort, though forty or fifty miles distant. The Saptin at this place is 800 feet wide. Eighteen miles below the Fort are the American Falls, where the banks of the river assume a basaltic character, which extends with but little interruption to its mouth. One hundred and fifty miles farther down the river occur the Salmon Falls, which, as its name imports, is the principal fishery on this river. Between this point and the Salmon River on the north-east the country is entirely broken up and impassable, while on the south-west is a vast arid plain, on which there is not a single spot where grain or pasturage can be grown. This will give an idea of the utter worthlessness of this extensive tract. The river from these falls runs in a north-west direction seventy miles to Fort Boisé, where it is joined by the Owyhee from the west, and Reid's River from the

east. The Blue Mountains to the north of this fort begin to show signs of improvement in soil, and are sparsely covered with trees; these, after passing the Burnt River, become densely wooded to their termination at the western turn of the Saptin. The course of the Saptin, from this to its junction with the Kooskooskie, is nearly north a distance of one hundred and fifty miles, and one hundred miles from Fort Boisé it receives the waters of the Salmon River, which rises in the Rocky Mountains near the head waters of the Missouri. This is the most important tributary of the Saptin, is two hundred miles in length, and has but few branches, which is very remarkable in this country, and is thought to offer the most feasible route for communication with Oregon, avoiding most of the difficulties which are now experienced on other routes. At its head waters there is a tract better adapted for cultivation than any other part of this section.

The Kooskooskie joins the Saptin at its turn to the west. It has its sources in the spurs of the Rocky Mountains. Its length is 130 miles, and, unlike the Salmon River, it has many small streams which flow into it. This is the river on which Lewis and Clark, after crossing the mountains, embarked. From the mouth of Kooskooskie the Saptin turns short to the west, passing through the Blue Mountains, and, after flowing eighty miles in that direction, empties into the Columbia, its banks still retaining their basaltic character. It is only navigable in particular parts, in consequence of the whirlpools and rapids produced by its swift current.

The tributaries of the Columbia, between the mouth of the Saptin and the Cascade Range, have already been mentioned, and the country through which they pass described. They are not navigable, but offer opportunities for getting timber to a market. The country around the head-waters of the John Day's and Umatilla Rivers, on the western slope of the Blue Mountains, is fertile and offers every inducement for settlers. Connected with these lands is the "Grande Ronde," an extensive prairie within the Blue Mountains, which is well calculated for a large settlement. The route from the United States passes through it.

That portion of the country known as the Willamette Valley

lies to the south of the Columbia, extending to the Elk Ridge, where the river takes its rise. Mackenzie's Fork has its source in the Cascade Mountains, and after flowing thirty miles west, joins the main stream. The principal settlements of the country have been made in this valley, on account of its good soil and easy cultivation. It is divided into an upper and lower prairie; the first is adapted for pasturage and the raising of stock; the latter arable and productive land, on which all kinds of grain yield abundant crops. The southern end of the valley rises gradually into undulating hills, destitute of trees, except a few oaks, which are found on the banks of the streams. The soil is a red decomposed basalt. The Willamette river flows nearly north, in the middle of the valley, and has several small streams which empty into it. Fifteen miles below the valley the river falls about twenty-five feet, and at this place is 350 yards wide. These falls are thirty-three miles from its junction with the Columbia; and the river is navigable to the Klackamus, three miles farther down. The banks below the falls are high and basaltic, to within four miles of its mouth, when they become low and subject to be overflown. Its width varies, from there being many islands in it, which are covered with beautiful groves of oak. The freshets in this river take place in February and March, and by the sudden rise at times do great damage.

At the Falls is the principal settlement in the territory. It has received the name of Oregon *city*. Its location is very contracted, and ill adapted for trade. The principal advantage of its site is its suitableness for the establishment of mills, and its being one of the best salmon fisheries in the country.

There are two or three valleys parallel to the Willamette, which, although not of great extent, yet claim some notice from their fertility. The principal one is called Faulitz Plains, and is divided from the Willamette by the Yam Hills. These are clothed to their very tops with grass, and afford excellent pasturage. These valleys have streams passing through them emptying into the Columbia and Willamette.

The Elk Hills divide the valley of the Willamette from that of the Umpqua. They have a gradual ascent, and are covered with pines, spruces, and oaks, with a thick undergrowth. The

soil is hard and dry, the substratum being sandstone, which is finely developed on the banks of the streams. The grass is thin, and mixed with ferns.

The valley of the Umpqua runs east and west. It is watered by the Elk River, and the north and south forks of the Umpqua. The valley may be described as a succession of plains, of different altitudes, rising from the streams. The beds of the rivers are composed of sandstone and clay slate, among which occur a few nodules of lime-stone. The rocks contain a few fossils, and some seams of coal or lignite appear. Large deposites of the latter, it is thought, will be found in this neighbourhood. The width of the valley is about thirty miles, and extends from the sea to the Cascade Range, in which the north fork of the Umpqua has its source. The soil is very good, and produces fine crops of corn and wheat.

This valley is bounded on the south by the Umpqua Mountains, which divide it from the Shaste country. These are composed of talcose rocks, intersected by veins of quartz, masses of which are found strewn over the whole country to the south. Their greatest elevation is 1750 feet. Part of this ascent is gradual and easy; but towards the summit, on which is a grassy plain, they rise very abruptly. The whole of this range is thickly timbered with a variety of trees. The pinus lambertiani is here first met with.

The north branch of the Klamet or Tootootutna River flows through the Shaste country. It is a beautiful stream with a rapid current, and rises in the Cascade Mountains. The banks are low and overgrown with bushes for some distance. Two or three hundred yards from the stream the land rises suddenly ten feet, and again at the same distance beyond, when the hills ascend to the height of six or seven hundred feet. The soil on the banks of the river is poor and sandy; on the hills granitic sand. Granite of a light colour and fine grain is found here, admirably suited for building purposes. This valley, lying between the Umpqua Mountains and the Boundary Range, in lat. 42° N., is much encroached upon by the spurs, and in consequence there is little land fit for cultivation.

The Boundary Range rise to the height of 1200 or 2000 feet. Some of these summits have a mural front, giving them a

basaltic appearance. They are, however, of sandstone, and contain fossils, and boulders of granite and syenite occur. From the summit of this Range, a view of the broad valley of the Klamet, surrounded by hills covered with forests of evergreens, is obtained, through which the Tootootutna or Klamet River flows, and passes out on the west to the sea. In the centre of this valley is a remarkable isolated conical peak, which rises to the elevation of 1000 feet, and is destitute of trees, except at its very top. The river is about eighty yards wide, with low banks and pebbly bottom. The volume of water is about equal to the Umpqua. It takes its rise in the Klamet Lake, on the east side of the Cascade Range. In the eastern part of this valley, large masses of gray porphyritic lava forming conical hills, are very numerous. The Klamet valley is far inferior to any portion of the country north of it, and in comparison may be deemed barren, it is twenty miles in width, gradually rising towards the mountains. The Shaste Mountains, which separate this valley from California, have been already described in speaking of that country.

That portion of the western section north of the Columbia, which lies between it and Puget Sound, is watered by several streams, some of which flow into the Columbia on the south, others into the Pacific on the west, and others into the Puget Sound on the north. These all rise in the spurs of the Cascade Range, and drain this part of the country. The land between the Cowlitz and the Chickeeles is an extensive prairie, known as the Cammas Plains. The length of the Cowlitz River is thirty-five miles. It is not navigable during a large portion of the year, but in the freshets, discharges a large quantity of water into the Columbia, and so great are these floods, that it has been known at times to overflow its high prairie. About its head waters lie some of the finest land to the north of the Columbia, on which a considerable settlement has been already made by the Hudson Bay Company, called the Cowlitz Farm. Ten miles north of which, on the route to Nisqually, is one of the branches of the Chickeeles flowing to the west, where its width is thirty yards: its course soon changes to the north, passing round the only hill, rising some 500 feet above the level of the

plains, which exists between the head waters of the Cowlitz and Puget Sound.

The soil to the north of the Chickeeles is light and gravelly, while that to the south, including the Cammass Plains, is a rich clayey loom.

The Chickeeles finally takes its course to the west, and empties into Gray's Harbour; previous to which it is joined by many small streams, which have their sources in lakes.

The country from the seaboard to the Cowlitz is covered with a dense forest of spruce, pine, and hemlock. The soil is a brown or black vegetable earth, with a sub-stratum of clay. The patches of alluvial land bordering the Chickeeles River are fertile, and of some extent, studded with white-oaks, which would yield good crops of wheat, and are excellent sites for farms, having an abundance of fine water, and but a short distance from water communication.

The country in the neighbourhood of Puget Sound presents an inviting aspect, and with the exception of some bluffs, is undulating, and covered with trees of the species spoken of above. The soil of this forest-land is a thin brown stratum of sandy vegetable earth; the sub-soil of clay and gravel; the latter having the appearance of being water-worn. These are succeeded by the tract of prairie-lands in the vicinity of Nisqually, which are valuable as pasture-lands for flocks of sheep and dairy-cows. These prairies have a very extensive range in a south-east direction, and connect with the valley of the Cowlitz on the south towards the Cascade Mountains, intersected by strips of forests. Within this district are numerous ponds or lakes, surrounded by rich meadow-land; furnishing luxuriant crops of nourishing herbage. No part of Oregon is better adapted for dairy purposes than this; and wheat, rye, barley, oats, &c., come to perfection.

The peninsula of Cape Flattery, north of the Chickeeles, between Puget Sound and the Pacific, is rough and mountainous, and covered with a dense forest. The principal trees are hemlock, spruce, and arbor vitæ. The high ridges which jut in all directions from Mount Olympus leave but little space for tillage, except along the western side of Hood's Canal. Little, however, is known of the interior of this portion.

It will be seen from the foregoing description, that the western section, although the smallest, is better adapted for cultivation and the subsistence of man than the others; and even the latter are by no means so barren and worthless as they have been represented; a larger portion being well suited for grazing, and in places also for agriculture.

CHAPTER IX.

CLIMATE OF OREGON.

The climate of the three sections may be classed as mild, temperate, and severe; that of the western comes under the first class, having neither the extremes of heat during the summer, or of cold during winter; this is probably owing to the prevalence of the south-west winds, and the mists which they bring with them from the ocean. The winters are short, lasting from December to February, and may be termed open. Snow seldom falls, and when it does, lasts but a few days. Frosts are, however, early occurring in the latter part of August, which is accounted for by the proximity of the snowy peaks of the Cascade Range, a mountain or easterly wind invariably causing a great fall in the temperature. These winds are not frequent; and during the summer of 1841, they were noted but a few times. The wet season lasts from November till March; but the rains are not heavy, though frequent. The climate during winter is not unlike that of England, and as to temperature is equally mild with that of 10° lower latitude on our eastern coast. The fruit trees blossom early in April.

The weather at Nisqually between the middle of May and the middle of July, may be inferred from the following statement of winds:

Dir.	*No. of Days.*	*Dir.*	*No. of Days.*
South-west	21	North-west	2
South	16	Calm	8
North	19	East	2

The mean temperature during the same period was 67°, maximum 98°, minimum 39°; the barometer 30.04 in.

From June to September, at Vancouver, the mean temperature was 66°, maximum 87°, minimum 51°; out of 106 days, 76 were fair, 19 cloudy, and 11 rainy.

The second or middle section is subject to long droughts, the summer is much drier and warmer, and the winter colder, than the western section; its extremes of heat and cold are more frequent and greater; the mercury at times rises to 108° in the shade in summer, and falls as low as —18° in winter; the daily range of temperature is 40°. The atmosphere is, however, extremely pure and healthy. In summer the air is cooled by the strong westerly winds, mentioned as prevailing daily on the Columbia, which flow in to fill up the void produced by the heated prairie grounds. No dew falls in this section.

The climate of the third or eastern section is extremely variable, the temperature during the day differing 50° to 60°, renders it generally unfit for agriculture. In each day all the changes incident to spring, summer, autumn, and winter occur: this is true for nearly all seasons of the year.

CHAPTER X.

SOIL AND PRODUCTIONS.

For the following brief notices of the soil and productions of Oregon, I am indebted to the observations of Mr. Brackenridge, the Assistant Botanist and Horticulturist of the Expedition. These, as coming from one whose practical and scientific knowledge is well known, must have an additional value, and impart such information as will be of use to the emigrant, and no doubt of high interest to those who are desirous of obtaining a full acquaintance with the country and its capabilities. He believes that the success which has followed the cultivation of the fruits and vegetables that have been introduced, will go far to show what may be accomplished in Oregon, where both soil and situation appear to be admirably adapted to almost every want of a civilized people.

The lands around Gray's Harbour, clear of timber, are flat and wet, being for the most part salt marshes, and therefore of minor importance in an agricultural point of view. Fresh water is scarce near this harbour, and only to be had at low water in the centre of the creeks, up which the tide flows several miles, by wading into them two or three feet deep in blue mud, so tenacious in its nature that cattle once in it could not well extricate themselves.

Near the coast inside of Point Adams, at the confluence of Young's River with the Columbia, exists some good land. Above this the shores of the Columbia, as far as the mouth of the Willamette, are chiefly steep and rocky, with occasional patches of alluvial deposit. The hills on both sides are covered with stately timber, belonging mostly to the family of the *Coniferæ*. Majestic trees of Cotton Wood (*Populus tremaloides*), Maple (*Acer macrophylla*), and *Arbutus procera*, with occasional belts of Oak (the latter by no means a common tree here), line its shores and islands, and occupy the alluvial patches above mentioned.

In the neighbourhood of Fort Vancouver, on both sides of the river, the country presents a more encouraging aspect to the farmer. Close to the Fort, rich and extensive tracts have been cleared and are now in a high state of cultivation. The best Wheat lands are of a deep rich brown loam, originally of a very tenacious consistency, but now become friable by being tilled and cropped for a succession of years. The Woodlands are of a brown sandy nature, and when cleared produce good crops of peas, oats, barley, rye, potatoes, and turnips.

On the opposite side of the Columbia, near its junction with the Willamette, there are fine undulating prairie lands, which have been rightly designated "the Garden of Oregon." The depth and richness of the soil will stand comparison with the finest lands in the United States. The soil on the flat lands consists of a deep, dark coloured loam, which bears from five to seven good crops of wheat in succession without the benefit of manures. On the rolling portions of this country are tracts of brown sandy loam, red gravelly light earth, with occasional beds of black sandy vegetable mould. Portions of all these kinds of lands lie under cultivation. For any kind of green

crops, as turnips, etc., these light lands are admirably adapted, and the wheat grown on the low deep loamy lands will stand comparison with that grown in any other quarter of the globe. The cultivation of corn (*Zea Mays*) has proved a failure on the Willamette, if we except that variety called the "sugar corn," and even this kind has not been grown to any extent. This failure may be attributed to the coolness of the nights in this part of Oregon.

Although no forests of oaks exist in Oregon, yet a large number of detached trees of white oak stud the rolling prairie lands. There are also two kinds of maple (*Acer cercinatum* and *Acer macrophyllum*), with a stately dogwood (*Cornus Nultallii*): these are valuable kinds of hard wood for machinery and agricultural implements. The oak trees are well adapted to form knees for ship-building.

The country from the Willamette to the Umpqua is rolling prairie land. The more elevated of these swells or hills being crowned with oak trees of larger growth than are found near the Willamette. Between these hills, glades of meadow lands, and lakes and streams of fresh water, are fallen in with frequently. The herbage in many places is luxuriant, and there is sheep pasturage of the finest kind in abundance. *Hosackia*, a plant having the habit of Lucern, abounds in this country, on which cattle feed greedily.

The land on either side of the Umpqua River, between the mountains and the coast, is fertile; but as you approach the coast, large tracts of salt marsh continue along it, as far at least as the mouth of the Klamet River. The country, again, beyond the Umpqua as far as lat. 42°, is for the most part mountainous, and clothed with heavy timber; the famous Lambert pine (*Pinus Lambertianii*) was first met with on the Umpqua mountains, which is its northern limit. Frequent open valleys present themselves in these woodlands, but the soil in most cases is poor and gravelly. In the valley of Klamet River, numerous large rocks, with scraggy buckthorns and arbutus (*Arbutus tomentosa*) bushes, impart to this locality an arid and rugged aspect. For the rearing of neat cattle, and flocks of sheep, this section of the country is better adapted than for any other purpose. Independent of the general sterility of this country,

there are still small patches of good land to be found, sufficient at least to produce grain enough for a scattered population, whose principal business would be to attend to the herds of cattle.

The middle region of Oregon has been represented as barren and unprofitable; but, from a careful survey, and observations on its natural productions, its real value has been much underrated. The meadow lands which skirt the Wallawalla, (a small river which takes its rise in the Blue Mountains,) are little, if any, inferior to those in the valley of the Willamette. The heavy crops of wheat, peas, barley, oats and potatoes, on a small farm near the Fort, and also on a farm of the Mission, are to be regarded as positive proofs of the fertility of the soil in this quarter; and a vast field, of equally good land as that we have reference to, awaits the enterprising emigrant, along the plains which flank the Blue Mountain Range.

To the south and eastward of Fort Wallawalla there exists a very considerable tract of sandy useless land, which bears little else than a species of wormwood (*Artemisia*), and a prickly pear (*Opuntia*). But in taking a line of route, so as to strike the Lewis River where it receives the Koos-kooski, you will have passed the barren region above mentioned, when about ten or fifteen miles from the fort; then begins a rolling prairie-land, clothed with luxuriant herbage, consisting of various kinds of grasses, and a red clover, having very much the appearance and habit of that cultivated in the United States; also several species of dwarf vetches; here is also found, in great abundance, the prairie-wheat. This wheat is a species of grass belonging to the genus *Elyncus*, found growing in tufts or bunches, principally in the vicinity of marmot villages. In rich grounds it attains the height of four to five feet, but we have often seen it on poor land not higher than two; its general appearance, so far as habit goes, is much like that of the cultivated wheat. Horses and neat cattle are very partial to this grass as feed.

Of wood there is none; it is particularly wanting in the vicinity of the places where the pasture is finest; but the Blue Mountains not being far distant, enough of that article could be obtained for all domestic purposes.

From the Koos-kooski to the Spokane River is an extensive

rolling prairie-land, which produces fine pasture. There is also a section of fine arable land, lying about twenty to twenty-five miles northward of the Koos-kooski. A belt of pine and spruce trees grow near, in an east and west direction. Nor is this the only district where the lands may be considered as arable, or worthy of culture. There are several tracts of land, though of minor extent, to be found over this vast prairie.

From the banks of the Spokane, fifteen or twenty miles, the land is rocky and sandy, with a considerable number of pine and other trees scattered over its surface; the woods near the river partake of the character of a forest.

Although portions of this country are well adapted for cultivation, yet, on the whole, it is better for pasture near the Spokane and Koos-kooski rivers, where there is wood and water: herds of cattle and flocks of sheep could be led out on either side so as to occupy the majority of this extensive prairie. The want of water in this quarter is the greatest defect; but sheep do not require much where there is abundance of a fine succulent grass, and neat cattle could be confined to those sections where water is in abundance, or to the neighbourhood of the Spokane, where there are several fine lakes; or to the belt of wood, as mentioned above, towards the Koos-kooski. These are desirable situations for farmers to locate themselves. These pools are generally surrounded by willow; and wherever these kinds of bushes are found on the prairie, water can be found on the surface, or can be had by digging.

The valley of Chimikame extends from the banks of the Spokane to Fort Colville, a distance of sixty miles. A good deal of the land in this valley is inclined to be wet or marshy, producing excellent grass.

At Fort Colville wheat is the grain most cultivated, being considered more profitable than oats, barley, or rye. Indian corn (*Zea Mays*) succeeds here admirably; and it is somewhat remarkable that at the Willamette its culture has proved almost an entire failure. The sheltered situation of Fort Colville precludes the possibility of the cold, biting, nocturnal winds injuring it, whereas, on the Willamette, little attention has apparently been paid to selecting a sheltered and warm exposure for the corn-field; and the low temperature here during the night must

be attributed to the presence of several lofty snow-capped mountains in the neighbourhood, by the chilling influences of which the climate around Colville, by its greater distance from such mountains, is not so much affected, independent of its embosomed position in a woody, hilly country. Cattle increase rapidly here; a single bull and cow were brought to Colville in 1825, and the head of cattle from that stock alone amounted, in 1845, to 196. The stock is becoming very much improved by crossing the Kentucky with the Californian breed; the latter yielding the best beef, while the former, being better milch cows, are selected for dairy stock. Pork also thrives here. There is a flouring-mill on a small river a few miles from the fort.

From Colville to the junction of the Spokane River with the Columbia, the country is of a gentle hilly nature, covered thinly with timber of the pine and spruce kinds. The soil is light and sandy, and may be considered rather a poor country; the pasture being very thin and not of the finest kind, although there were a few ravines, whose sloping banks are pretty well lined with good grasses. The forest approaches close to the Columbia, whose sloping gravelly banks are here and there broken up by rugged projecting rocks.

From the upper end of the Grand Coulée, and following the Columbia as far down as the mouth of the Wallawalla, there is very little timber within a convenient distance of its banks on the north side, and none inland on the south. What little there is, consists of a few scattered pine trees along its shores; but the quantity is altogether too small to prove of any consequence to settlers.

The surface of the prairies, on each side of the Grand Coulée, and down towards Okanagan, is 1000 feet above the bed of the river. Considerable patches of what has the appearance of old *lava* lie on these prairies; they are most common near the Grand Coulée. In the neighbourhood of such patches the pasture is meagre and thin; but, on the whole, this country produces very fair pasture, particularly for sheep. Water is rather scarce, and what there is of it is generally found in shallow pools, and has a brackish taste. There is a considerable quantity of muriate of soda in it, which, in dry weather, is found encrusted on the surface of the earth, and has very much the appearance of

hoar-frost. The horses relish this salt very much. The want of water is the greatest disadvantage in the Okanagan district; and the grazier would have to avoid this difficulty, there, by taking a position where a good range for the cattle would be had, in a circuit around the watering places.

Of that sterile and unprofitable tract of country which lies below the mouth of the Piscous River, all along the north side of the Columbia, down to the Cascades, and as far back as the termination of the mountain spurs which set out from Mounts St. Helen and Rainier, little can be said for its agricultural capacity. Its aridity is not exceeded by any portion of Oregon. It is a tract of sandy desert, like that between Fort Nez-percés and the Lewis River: the Columbia only separates the two waste districts. The Yakima River flows through the main body of this tract, which is characterized by its scraggy bushes of wormwood (a species of *Artemisia*), with solitary tufts of various kinds of *Eriogonurus*, and batches of prickly-pears (*Opuntia vulgaris*). The grasses hereabout are generally very thin, except in creeks of alluvial deposit on the Yakima. Its soil for the most part is sandy, mixed with fragments of scoria or cellular lava of a reddish colour. No timber exists on the Yakima, if we except a few indifferent pine, poplar, willow, and alder trees, a little below where it receives the waters of the Shanwappum (Spipen). A few miles above the junction of these rivers, the character of the country changes, rising in hills, which are thinly covered with pine and fir trees. These hills increase in height, and the timber on them becomes a dense forest, as they approach the Cascade Range.

The valley of the Yakima, within the line of forest, is wide, flat, and free of timber, save a few straggling trees and bushes on its flat banks. On each side, the meadow or flat lands were clothed with fine pasture; and on higher lands in its vicinity, the prairie wheat, before mentioned, was found in abundance; and farther up the river, towards the base of the high mountain range where it takes its rise, good pasture and arable lands exist.

The mountain ridges between the Yakima and the Columbia, near the entrance to the Piscous River, were thinly wooded, often leaving openings of good grazing lands; but many of these

are so elevated and cold, that the grass in June was only a few inches high. Birch timber in Oregon is very scarce.

At Fort Vancouver the soil is of a light gravelly nature, but, by judicious management and stimulating manures, it produces good crops. Apple trees thrive, and, in the summer of 1841, were loaded with so heavy a crop of fruit, that many of the branches had to be supported by props. The most of the kinds which were growing, had been raised from apple-seeds imported from England. Few of the kinds were good dessert fruits; they were better suited for culinary purposes, or the making of cider. A number of young trees had been introduced. Scions of these, engrafted on the native crab-apple, would produce good fruit.

A variety of European grape vines, for several years after their introduction here, produced good crops of fruit. They were grown as espaliers, or against board fences. The results of this experiment with the European kinds of grapes, furnish sufficient proof of the future success, if attended to, of the cultivation of the grape vine in Oregon. A great many soils and situations are to be found on the shores of the Columbia River, between the sea-coast and the Dalles, suitable for the cultivation of the grape vine to a considerable extent. In the portion of country to the south of the Umpqua River, along the banks of the Klamet, where the finer European varieties would unquestionably succeed, a kind of fox-grape is found indigenous.

Peaches, nectarines, apricots, cherries, and plums thrive well at Vancouver. It is believed, that the deep rich soils in the valley of the Willamette are much better adapted to the growth of such fruits. Pears, and the English gooseberry, with the black, red, and white currant, all produce good crops. The raspberry and strawberry are found growing indigenous in woods and along banks of streams. Water and cantelope melons, with pumpkins, gourds, squashes and cucumbers, are grown. The melons are inferior in flavour to the same kinds of fruit produced in the state of Virginia, but equal to those of New Jersey, New York, or Pennsylvania.

The vegetables cultivated are the following: beans, kidney or French, bush, Lima, long pod, and Windsor; peas, several varieties; cauliflowers and broccoli; cabbages in variety, among them the Savoy; asparagus, carrots, parsnips, beets, turnips,

radishes, lettuce, endive, onion, leeks, shallots, and scorzonera, with a variety of pot-herbs of the more common kinds.

The soils on the Willamette are admirably adapted to the growth of esculents, as the onion, carrot, and cabbage; the former a very profitable article for exportation, the two latter as good winter feed for cattle.

Towards the Umpqua the more tender kinds of vegetables would attain greater perfection. In the interior of Oregon, where settlements have been made, some opportunities have been presented to demonstrate with what success horticulture in this part of the country can be practised. At these, most culinary vegetables succeed. All efforts have failed in the growing of apple trees; a species of marmot burrows under the trees and eats the roots, and is one of the evils incident to this region.

The following indigenous fruits, roots, &c., are used as food by the Indians of Oregon:

Camassia esculenta, vernac., camass. This is a kind of squill, having a bulb which resembles very much a small hyacinth root. The plant is found in greatest abundance in meadows of the prairie country above Fort Nezpercés: it is also common in alluvial lands on the margins of rivers and streams.

The tubers of several species of *Umbelliferous* plants belonging to the genus *pencedanum*. The vernacular name of one of these, which grows near the Koos-kooski, is "cowess."

Bulbs of various species of *calococtus* are also eaten by the Indians, but the roots being small, they do not form a very important article of food. They are found in the greatest abundance on dry prairies near the frontier of California. A few are also obtained in northern Oregon.

The roots of the *lupinus littoralis*, called by the natives *schomachtan*, taste very much like liquorice. The Indians are quite fond of it, and use it to sweeten their cammass roots. It is principally found on the low sand hills between Gray's Harbour and Chinook Bay.

The root of the *Lewisia rediviva*, Spatulam of the Indians, when macerated in water, forms a substance resembling starch. It is found only in the dry sandy districts of the interior.

In time of scarcity the *Sagittaria sagittifolia* also becomes

an article of food, but in plentiful seasons is seldom used by the Indians.

The stalks of the following *Herbaceous* plants are also eaten:

Typha, sp. of cat's-tail. The lower and blanched part of the leaves of this plant are crisp, succulent, and pleasant to the taste. It is a favourite vegetable (if vegetable it can be called) with the Chinook tribe. It is commonly found in swampy places, and along the banks of streams.

Ocnanthe sarmentosa. The Indians peel off the outer covering of the young shoots of this plant, and eat the crisp and internal part, which has a flavour somewhat similar to celery, though not as pleasant. It is found in great abundance over the whole country, in small streams and moist places in forests.

Huacleum, sp. of hemlock. The Indians strip off the bark of these plants, on which rest the poisonous glands, and in this manner do not suffer any bad effects from eating the inner part of the stem, which is crisp and succulent.

Nuts and seeds used by the Indians:

Pinus lambertiana. This tree grows to a great size on the Umpqua Mountains. The Indians collect the nuts or seeds, and store them away for winter consumption. Great quantities of hazel nuts are also collected, and are to be found in all the woods and thickets of Oregon.

The seeds of the sunflower, madias, and those of numerous other annual and perennial plants, are collected in great quantities, and are generally scalded with hot water before being eaten.

There are numerous fruits which are indigenous to Oregon. Among them are to be found the following, viz:

Gaultheria shallow. It ripens in August. The berries are produced on long racemes, of a black colour, and sometimes covered with a light bloom. They have a sweet and pleasant taste when they have received the sun, but those procured in forests are insipid. They are abundant in the forests near the coast, on the margins of streams, and in open glades.

Fragana chilensis, sp. of Strawberry. The fruit is rather smaller than that grown in the United States, but the flavour is quite as pleasant, although the small villous hairs that cover the pulps render it rather disagreeable to the mouth. It is

found in the interior as far as Fort Colville, but is most abundant on the banks of the Columbia, near Vancouver, on Puget's Sound, and in the Willamette Valley. It ripens in June and July.

Rubus spectabilis, "Yellow raspberry." The fruit is a yellowish, sometimes a rosy tint, of an oblong form, and somewhat translucent, taste watery; but by cultivating this plant in a good exposure, it might be much improved. The plant is found in the lower section of Oregon, in rich soil, on the margins of streams, and in shady woods.

Rubus strigosus. This and the former are called by the Indians "Uholay." The fruit is smaller than the yellow, and of higher flavour. There is also a third species, bearing a black berry.

There are several different species of "blackberries," gooseberries, currants, and whortleberries, many of which are dried by the natives, and put aside for winter stores.

Amelanchier Canadensis, "Service tree." The fruit, when ripe, is a blackish-purple, and about the size of a large pea. It has a sweetish taste, ripening in July and August, and at this season forms the principal food of the Indians in many parts of the country. The bush grows, to the height of eight or ten feet, along the banks of streams in the interior.

Pyrus rivularis, "Crab apple." The fruit is about the size of a small cherry, of a yellow colour when ripe, but often tinged with red. The flavour is a little tartish, but pleasant; the Indians generally roast them before eating. This tree grows about twenty or thirty feet, and would answer very well to graft improved kinds of apples on, as it is very hardy, and a native of the soil. The wood is very hard, and is used by the Chinooks for wedges.

Prunes, sp. "Red plum." The fruit is oval, about three-quarters of an inch in diameter, of a purplish colour, very juicy, and agreeable to the taste. It grows fifteen or twenty feet high, and is found in thickets on the margins of streams, between the Willamette and Umpqua Rivers. It would make excellent stocks to bud or inoculate peaches, plums, or apricots on.

The Indians in Oregon make use of the dried leaves of the

Arbutus Uva-ursi to mix with imported tobacco, which they smoke. No tobacco is cultivated in Oregon; but one species is said to be indigenous to the country near the southern boundary of this territory,

CHAPTER XI.

HARBOURS OF OREGON.

Oregon offers, for its extent of sea-coast, a distance of 400 miles, but few harbours which can be entered with safety at all times.

The first, north of Cape Mendocino, is Trinidad Bay: this was visited by Vancouver, and described by him; there is a small sunken rock between two islets, which escaped his observation; plenty of good water may be had at this place; during the strong westerly winds, however, the bay is unprotected. The anchorage is situated in lat. 41° 04′ N. and long. 123° 55′ W.

Thirty miles north of Trinidad Bay is the mouth of Smith's River, on the bar of which there are three fathoms water. The land on the north is high and abrupt, but on the south a narrow neck of dry sand projects, with a perpendicular rock on the extreme point. The current sweeps out of the river with great velocity, causing heavy breakers on the bar, which at most times prevent vessels from entering. The soundings outside are regular, and there are three sunken rocks about a mile distant from the sandy point.

St. George's Bay, in lat. 41° 44′ N. and long. 124° 00′ W., has good anchorage, and is protected from the north-west winds by several rocky islets: no fresh water can be obtained.

Pelican Bay is very spacious, and secure during the north-west gales: there are several small rocks close to the shore, near which a stream discharges itself; from it water can be procured in boats.

The Klamet or Tootootutna River has a very narrow entrance, with a low shingle beach on either side, by which it may be known. There are two fathoms water on the bar, and inside from four to five for a quarter of a mile; the flats then begin,

and the overfalls extend for several miles; the tide rises six feet. Wood and water can be had in any quantity. The mouth is situated in lat. 42° 26′ N. and long. 124° 11′ W.

The entrance to the Umpqua River is between two sand spits; the northern one is a mile and a half long; on the southern spit is a small rock. There are two fathoms water on the bar, which lies outside of the spits; between them, six and seven, and inside, eleven fathoms. The river, for the distance of ten miles, admits vessels not drawing more than twelve feet.

Between Cape Mendocino and Columbia River there are several small rivers which empty in the ocean; viz. the Sequalchin, Cotamyts, Coquils, Cahoos, Sciistium, Aleyco, Cowes, Zasatish, and Iconic; most of these can be entered with boats in fine weather, and fresh water obtained.

The mouth of the Columbia River has been long known for its dangers, and the difficulties of entrance. These have not been exaggerated; and it may be truly said to offer very few advantages as a port. The land near it is well marked. Cape Disappointment, the northern point, is high, with several lofty spruce and pine trees on its summit. Point Adams on the south is low and sandy. A sand-spit makes out from each cape; that from Point Adams projects to seaward of the other, being nearly at right angles to it. The distance between them is one mile. These have been formed by the deposit of the sands brought down by the river, or washed by the abrasion of the sea from their respective capes. The *bar* lies outside, and on it there is no particular danger unless the sea is heavy, when breakers form on it, and a vessel would be subjected to risk in passing. The least depth of water is twenty-eight feet. The breakers on both spits are usually heavy, though at times there is little or no break on them. The *south end* of the *north* spit has to be closely approached, and is the point of greatest danger. Here most of the wrecks have occurred.

The principal dangers in the entrance of the Columbia are the cross tides, their velocity, and the influence of an undercurrent, together with the heavy swell. These become greater from the distance of the leading marks for the channel, and their indistinctness when the weather will permit entrance. It is necessary to use them, in consequence of the compass bear-

ings being of little or no use. I have inserted the sailing directions in a note below.*

* It is safest to enter on the ebb-tide, with the usual north-west wind, which sets in about ten or eleven o'clock, A. M., during the summer months. The entrance should never be attempted with a flood-tide and north-west wind, unless the Clatsop channel is followed, and the sea is smooth.

After making Cape Disappointment, which is easily distinguishable by the dark hummocks and tall pines, trimmed up, with the exception of their tops, you may lead in for it on a north-east bearing, if to the southward; if to the northward, you may run in until you have that bearing on. A hummock, or saddle-hill, to the northward, on with the outer part of the cape-land, will give you notice that you are on the bar, in 4½ or 5 fathoms water: in ordinary weather, the outer line of the north spit is readily perceived by the rollers breaking; the inner line is always perceptible. When Young's Point is open with dead trees on Point Adams, you will be to northward of the end of the north spit, and may run down along it until those two points are on range; then haul in for Point Ellice, or the green patch on Chinook hill, if intending to take the channel by the cape. When *Leading-in cliff* is well open with the inner point of the cape, haul up for the latter and steer in; you will then have doubled close round the north breaker, in 7 fathoms water; and it is better to keep the north spit aboard if the wind is not so scant as to oblige you to beat up for Cape Disappointment: on opening Green Point, you must go about; it is not safe to go nearer the middle sand. On ordinary occasions, there will be scarcely ever a necessity to tack; the ebb-tide on your lee bow will keep you sufficiently to windward.

The cape will be required to be passed close aboard, in order to avoid the *sand-spit* making off from the *middle sands* towards the cape: the two outer bluffs of the cape, in range, will strike it. After you have passed this range, you may steer into Baker's bay, and, having passed an opening in the wood on the cape, you may anchor in from 7 to 10 fathoms. In passing the cape, care must be taken not to be becalmed by it; if this should happen, the only resource is to down anchor at once, and wait a favourable tide. The current will be found very strong. It sometimes runs from 5 to 6 knots an hour — a perfect mill-race — and no boat can make way against it when at its strength.

If desirous to proceed up to Astoria, and one of the native pilots is not to be had, the only precaution necessary in proceeding up is to keep the small islet in the *cove* of the cape open until you have the *dead trees* nearly S. S. E., (compass,) and then steer over for them, as it will be probably young flood. It is necessary to keep the starboard or sand island side of the channel, and if near high water, this island, in running up, must be kept open on the starboard bow; otherwise, the approach to it would be too near for safety. On reaching the Clatsop channel, steer up for Young's Point, keeping in 5 or 6 fathoms water. The sand shoals on either side are very bold. When abreast of Astoria, moor with an ebb and flood anchor, with open hawse, to the northward and westward.

There is little doubt that the spits are undergoing constant change, and are both increasing. This is corroborated by those who have had the most experience. In the memory of many, Cape Disappointment has been worn away some hundred feet by the sea and the strong currents that run by it. The *middle sands*, which lie within the two spits, and occupy a great extent of the bay, are subject to still greater changes. In the course of two months a large portion of what was dry sand was washed away. The sea usually breaks on the western edge of these sands. Two vessels have been wrecked here within the last

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If the intention be to take the Clatsop channel, the same directions are to be observed in passing the north spit. When the Leading-in cliff is open, instead of hauling up for the cape, steer direct for the Clatsop village on Point Adams, which will take you into fair channel way; the breakers on each side will be visible: keep in the middle and steer up for Young's Point, following the directions as before given.

In coming out, the state of the bar may be distinctly seen from the top of the cape, but due allowance must be made for the distance. The surf beating on the cape is a good guide; if there is much of it the swell will be very heavy and sharp between the north and south spits, if it does not actually break: the best time is with a north-west wind and about half ebb; you will then have tide enough to carry you to sea.

I look upon it as always dangerous to drop anchor in the channel between the cape and the end of the north spit; if it is done, it should only be in case of absolute necessity, and not a moment is to be lost when possible to proceed out or in. If the ship gets off with only the loss of an anchor, she may consider herself fortunate. The sea breeze or north-west and westerly winds blow at times very fresh; a sure indication of them is a thick hazy bank in the west, to seaward.

In entering the river the following cautions should be attended to:—1. The entrance should never be attempted when the passage between the north and south spits is not well defined by breakers; it is equally dangerous, whether it be concealed by the sea's breaking all the way across, or so smooth as not to show any break.

2. The wind generally fails, or falls light, in the passage between the north and south spits, if it blows but a moderate breeze, and leaves a vessel at the mercy of a strong tide and heavy swell.

3. The best time to enter and depart is after half ebb and before quarter flood; the tide then runs direct through the channels, and is confined to them. With the prevailing westerly winds, for those intending to take the north channel, the best time to enter is after half ebb, though the wind may be scant; yet the ebb tide, acting on the lee bow, will enable the vessel to keep to windward and avoid the spit on the middle sands.

year; the barque Vancouver, one of the Hudson's Bay company's vessels, and the whale ship Maine, both totally lost.

After passing the spits, the *old* channel leads to Baker's Bay, the usual anchorage for vessels awaiting an opportunity for departure. This bay is by no means well sheltered during the stormy months, being exposed to the south-east. Good water and wood can be procured. The *new* or *Clatsop* channel leads directly to Point Adams. Changes in both the channels are said to have taken place since the surveys made by the Exploring Expedition. The alteration in the former is caused by the accumulation of sand about the wreck of the Peacock; that in the latter by the greater deposit of sands from the failure of the common spring freshets. I am led to believe that neither is of the extent reported, and I feel satisfied that the Clatsop channel will be kept open by the action of the current of the river, and ought to improve in depth. Before any degree of reliance can be placed on these reports, an accurate survey of the river ought to be made, which will serve to show the changes that have occurred since that made by the Exploring Expedition; and a comparison of the two surveys will point out the causes that may be at work to effect it, and the probable remedies that may be used to prevent the change, or arrest its progress.

Astoria is situated six miles distant from Point Adams, above the junction of Young's River with the Columbia. Its site is ill adapted for commercial business, the channel at this place being narrow, and only able to accommodate a few vessels. The river is three and a half miles wide, but the middle is occupied by extensive sands, with only a few feet water on them.

Shoal-water Bay lies on the north side of Cape Disappointment. It is a deep indentation in the coast, but from its exposure to the north-west can be of little use for the protection of vessels. It is surrounded by a low sand beach.

Forty miles to the north of the Columbia is Gray's Harbour, at the mouth of the Chickeeles. The points to the north and south are composed of low sand hills, and from both of these project sand-spits somewhat similar to those of the Columbia. On the northern is Eld's Island, with several hillocks, which appear as

one from seaward. The channel is narrow though deep, and is two miles in length. This harbour is easy to enter, the wind being usually fair, and it is only necessary to keep clear of the breakers on either side; but the same cause makes it very difficult to depart from. The bay is capacious, but the extensive mud and sand banks confine the anchorages and channels to very small space. The land about it is low, with the exception of Brackenridge Bluff on the north, and Stearn's on the south. These are both covered with pines; the latter bearing S. 85° E., and on with the south side of Eld's Island, will lead into and through the channel.

There are some few small bays between Gray's Harbour and Cape Flattery, a distance of ninety miles;—one at Point Grenville, off which are some rocks,—and small streamlets discharge into them. Destruction Isle is one of the dangers to be avoided. It may readily be known by a perforated rock near it. This coast offers anchorage the whole distance, and ought not to be approached nearer than the depth of 15 fathoms. The currents set towards the land. The Flattery rocks are ten miles south of Cape Flattery and stand four or five miles from the land: they are from fifty to one hundred feet high, black, and pillar-shaped. During the fine season vessels may anchor on any part of the coast, from Cape Flattery to Cape Mendocino, in from twenty to thirty fathoms water without danger.

The Straits of Juan de Fuca, including the waters of Admiralty Inlet, Hood's Canal, and Puget's Sound, with the Archipelago of Arro, up to the 49th parallel, were all accurately surveyed by the Exploring Expedition, and the charts have now been published by Congress, and may be had at all the custom-houses; the whole is unsurpassed by any estuary in the world: they comprise very many fine harbours and safe anchorages, and are entirely free from dangers; they cover an area of about 2000 square miles: the country by which these waters are surrounded is remarkably salubrious, and offers every advantage for the accommodations of a vast commercial and military marine, with conveniences for docks, and a great many sites for towns and cities; at all times well supplied with water, and capable of being provided with every thing by the surrounding country, which is well adapted for agriculture.

The Straits of Juan de Fuca are ninety-five miles in length, and have an average width of eleven miles; at the entrance (eight miles in width) no dangers exist, and it may be safely navigated throughout. The winds blow for the greater part of the year from the westward, and at times strongly. The shores of the strait are bold, and anchorage is to be found in but few places; at some parts no bottom can be obtained, even within a boat's length of the shore, with sixty fathoms of line.

The north shore (Vancouver's Island) is rocky, and composed of conglomerate, and a reddish granite. On this side there are several inlets, in which there are anchorages, among them Port San Juan and Victoria. Victoria is a snug harbour, and has been lately surveyed and taken possession of by the Hudson Bay Company; it lies on the south-eastern part of Vancouver's Island. This harbour is one of the most important positions contiguous to our territories, and the only one where a naval depôt can be made of any strength or convenience in the territory now belonging to England; there is an inner and outer basin, sufficiently commodious for large ships of war. The Hudson Bay Company have already made it their depôt for furs, and the harbours being perfectly safe, may be visited at all times and during all seasons of the year; its position is an important one, and must, in the event of its being occupied by the British government as a naval station, produce much irritation, and may eventually lead to serious difficulty. Vancouver's Island rises abruptly, and is very much broken by mountain ranges, but well covered with timber. It is 240 miles long and 30 miles wide.

Neah or Scarborough Harbour, lying on the south side of the strait, just within Cape Flattery, is but a small indentation in the coast, which is partly sheltered on the north-east by Neah Island. This is the position where the Spaniards attempted to establish themselves in 1792, and the remains of the old fort can still be seen. Water is to be obtained here in some quantity, and a small vessel would have no difficulty in being supplied. It offers a tolerably safe and convenient anchorage, though exposed to north-west gales.

New Dungeness is a safe roadstead, and lies eighty miles from Cape Flattery, E. by S., true; the trend of the strait being E.

by S. and W. by N., nearly. The point of New Dungeness is well adapted for the position of a light-house: it projects into the strait, and would be seen a long distance, both up and down; the water close to the point is deep: a vessel may approach to within a quarter of a mile, and after turning it, safe and secure anchorage may be had in from ten to fifteen fathoms water; it is extensive enough to accommodate a very large fleet. The chart of this bay, and that of Budd's Harbour, adjoining, by the Exploring Expedition, will point out the facilities they offer, as well as that of Port Discovery; an abundance of wood, water, and fine fish, may be obtained there.

Budd's Harbour lies adjoining it, and is connected with the roadstead of New Dungeness by a narrow channel, which has a depth of two and a half fathoms, and may be easily deepened if necessary; it is a fine and very capacious harbour, being four miles long and one and a half miles wide, and perfectly secure at all times for repairs.

Port Discovery, seven miles to the south-east of New Dungeness, is very easy of access, and a well protected harbour; but the depth of water, and the high precipitous banks, will almost preclude its being made the seat of a settlement. The anchorage is close to the shore, in twenty-seven fathoms water.

The name of Port Discovery was given by Vancouver; it is seven miles long, one and a half miles average width, and its points, which terminate in low sandy projections, interlock each other. Protection Island covers it completely to the north, and would render it easily defensible against a formidable attack. The only objection to it as a harbour, is that already spoken of, the great depth of water, which in the middle is nowhere less than forty or fifty fathoms, and is often as much as sixteen close to the shore.

The Indians who dwell here are of the Clalam tribe. They occupy a few miserable lodges on one of the points, and are a most filthy race, so much so that the appearance of their lodges is absolutely disgusting.

There are few places where the variety and beauty of the flowers are so great as they are here; the general character of the soil around this harbour is a thin, black, vegetable mould, with a substratum of sand and gravel. The trees grow so

closely, that in some places the woods are almost impenetrable. The timber consists principally of pine, fir, and spruce. Of the latter there are two species, one of which resembles the hemlock-spruce of the United States: it has a very tall growth, and puts out but few, and those small, lateral branches. Some maple-trees grow in the open ground and on the banks, but they are too small to be of any service to the settler.

Port Townsend lies at the entrance of Admiralty Inlet; it is a fine sheet of water, three and a quarter miles in length, and one and three-quarters in width. On the west side is an extensive table-land, free from wood, which would be a good site for a town. This bay is free from dangers, and is well protected in the direction from which stormy winds blow. It has anchorage of a convenient depth, and there is abundance of fresh water to be had; the best anchorage is on the north side. The soil in this place is a light sandy loam, and appears to be very productive; it was covered with wild flowers and strawberries, in blossom, in May. From this place, Mount Baker is distinctly seen to the north-east, and adds a beautiful feature to the landscape, when its conical peak is illuminated by the setting sun.

Port Lawrence is just at the junction of Admiralty Inlet and Hood's Canal; it is a convenient anchorage, and is separated from one of the arms of Port Townsend by a narrow strip of land.

Passing the entrance to Hood's Canal, and up Admiralty Inlet, there are several anchorages where a vessel may await tide, in beating up; such as Pilot's and Apple-Tree Cove.

Port Madison is the first harbour, and affords every possible convenience for shipping; it is on the west side of the inlet, and communicates on the south, by a ship channel, with Port Orchard.

Port Orchard is one of the most extensive and beautiful of the many fine harbours on these inland waters, and is perfectly protected from the winds. The only danger is a reef of rocks, nearly in the middle of the entrance from Admiralty Inlet. It includes three arms, the most northern of which, though entered by a narrow channel, is from a half to one and a half miles in width, and extends for a distance of six miles. The water is deep enough for the largest class of vessels, with a bold shore and good anchorage.

MAP

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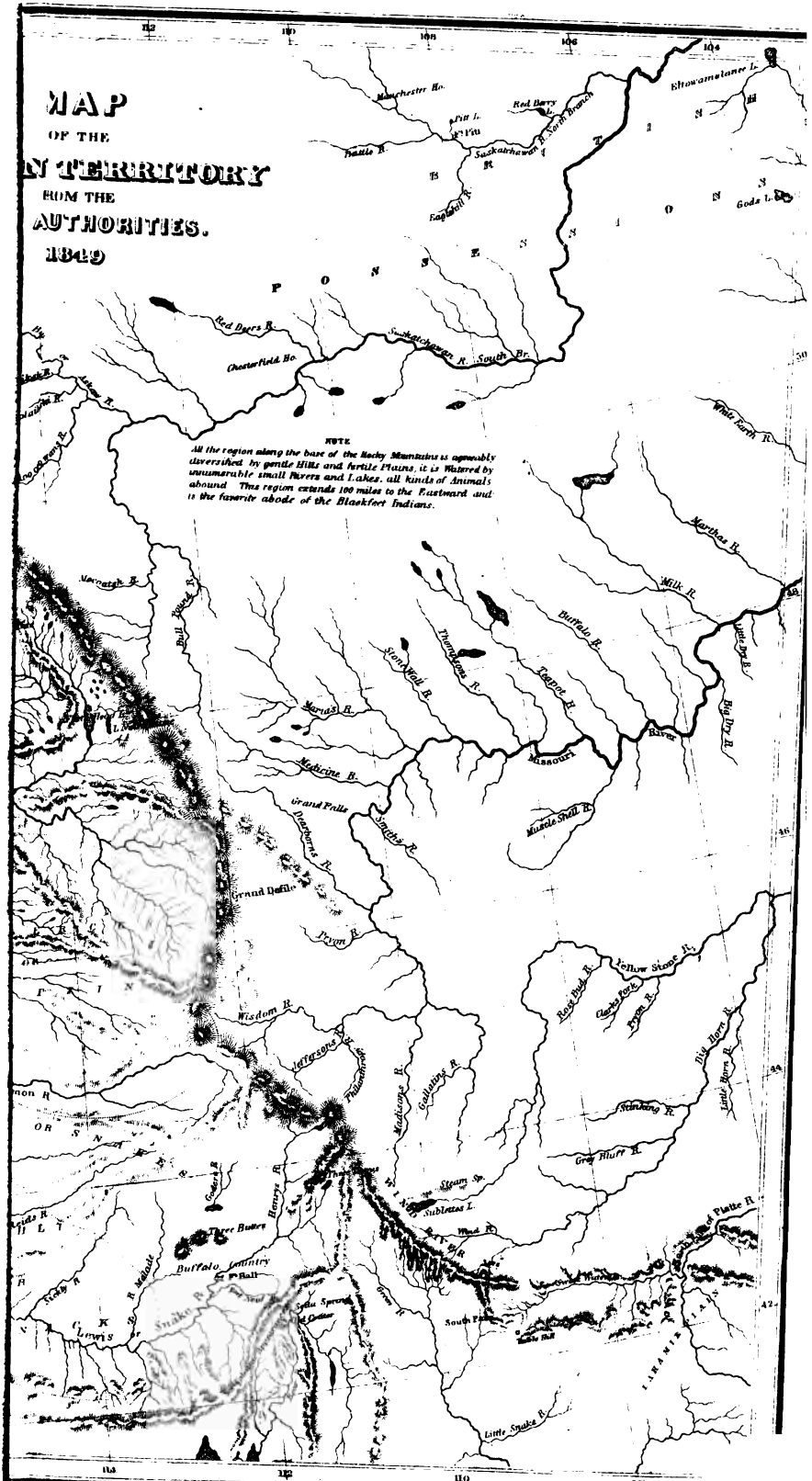

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The shores are covered with a large growth of trees, with here and there a small prairie; the soil is superior to that of most places around the sound, and is capable of yielding almost any production of the temperate zone.

Vashon's Island lies in Admiralty Inlet, above Port Orchard, and there is a ship channel on both sides of it; the best one is on the west; the two again unite just before entering the narrows leading into Puget's Sound.

Commencement Bay lies at the bottom of Admiralty Inlet, on the east channel: it affords good temporary anchorage, and a supply of wood and water can be obtained. There is a small stream emptying into it, called, by the Indians, Puyallup.

The Narrows, which connect Admiralty Inlet with Puget's Sound, are a mile in width and four and a half miles long; the tide here runs with great velocity, causing many whirlpools and eddies, through which a ship is carried with great rapidity, the danger appearing to be imminent. The banks rise nearly perpendicular, and are composed of sand-stone; a great variety of shrubs grow along their base. This narrow pass seems as if intended by nature to afford every means for the defence of Puget's Sound. Point Defiance, on the east, commands all the approaches to it.

Puget's Sound may be described as a collection of inlets, covering an area of fifteen square miles, the only entrance to which is through the Narrows, which, if strongly fortified, would bid defiance to any attack, and guard its entrance against any force.

The Inlets, in the order in which they come from the entrance, have received the names of Carr's, Case's, Hammersley's, Totten's, Eld's, Budd's, and Henderson's; they are united by passages, which form several islands and peninsulas. All these inlets are safe, commodious, and capacious harbours, well supplied with water, and the land around them fertile. On many of the islands and peninsulas are to be found slate and sandstone, which, though soft and friable in some places where it has been exposed on the surface, will be found suitable for building purposes.

Nine miles distant from the Narrows is Nisqually. Here the anchorage is very much contracted, in consequence of the rapid

shelving of the bank, that soon drops off into deep water, and only a few vessels can be accommodated. The shore rises abruptly to a height of two hundred feet, and on the top of the ascent is an extended plain, on which Fort Nisqually is built. On the hill-side is a well-constructed road, of easy ascent. Fort Nisqually, with its outbuildings and enclosures, stands back about half a mile from the edge of the table land. It is constructed of pickets, enclosing a space about two hundred feet square, with a bastion at each corner. Within this enclosure are the agent's stores and about half-a-dozen houses, built of logs and roofed with bark. Its locality is badly chosen, on account of the difficulty of obtaining water, which has to be brought a distance of nearly a mile.

In the garden at Nisqually, on the 12th of May, peas were a foot high; strawberries and gooseberries in full bloom, and some of the former nearly ripe, with salad that had gone to seed, three feet high and very thrifty.

The hill at Nisqually is an insuperable objection to the place ever becoming a deposit for merchandize, as it would very much increase the labour and expense of transportation. Water, however, can be obtained for vessels with great ease from a small stream that flows in abreast of the anchorage. The harbour is also exposed to the south-west winds.

Better sites than Nisqually, for the location of a town, are to be found in this neighbourhood. There is one, in particular, just within Kitron Island, about two and a half miles north of the Nisqually anchorage, where the shore has a considerable indentation, and, although the water is deep, vessels would be partially protected from the south-west, south-east, and north-west winds, which blow with great violence, and also from any sea. Water can be obtained with as much facility, and the hill is not so precipitous.

Case's Inlet extends to within two miles of the waters of Hood's Canal. Between these there lies Kellmsu pond. The communication might be easily made between them.

Hood's Canal extends for a distance of forty miles in a south-south-west direction, and then turns to the north-east for ten miles, approaching the waters of Puget's Sound, as above stated, with an average width of two miles. It contains several good

harbours, viz: Port Ludlow, Port Gamble, Suquamish and Scabock Harbours, and Dabop Bay, of all which surveys were made, and are published.

The banks of Hood's Canal, as far as Tskutska Point, do not exceed one hundred feet in height, and are formed of stratified clay, with a light gravelly soil above it, thickly covered with a species of pine. This is the character of the eastern shore, for the whole extent of the canal; but the west and north shores above this point become more bold and rocky, with a deeper and richer soil, formed by the alluvial deposits from the Mount Olympus Range.

On the east side of Admiralty Inlet, as well as at the head of De Fuca Straits, and the waters within the Gulf de Arro, as far as Point Roberts, in lat. 49° N., there are many fine harbours and bays formed by the islands and projecting headlands. Some of these are more extensive than others, but they will all in time become places of resort for vessels. Situated on the east side, they are more accessible for trade than those on the peninsulas on the west side; from having a larger area of country lying around them, susceptible of improvement, they must become more thickly and densely populated.

These bays and harbours are the following, viz: Commencement Bay, Elliot Bay, [Port Gardner, Port Susan, Holmes' Harbour, Penn's Cove,] Hornet's Harbour, Strawberry Bay, Billingham and Birch Bays. Those within the brackets lie within Whidby's Island. The charts of the Exploring Expedition now published, together with the Hydrographical memoir, will give all the particulars relative to their situation, advantages, &c., and those desiring such information are referred to them.

The Naval Archipelago between the Canal de Arro and Ringgold's Channel, offers many fine anchorages. The islands composing it afford large quantities of sandstone and granite for building purposes, which, from its nearness to water transportation, may be easily taken to any locality within these waters. Reference is also made to the charts of the Exploring Expedition for a more particular description of this locality. The Gulf of Georgia and Johnson Straits are not well adapted for navigation, in consequence of the rapidity of the tides and the

many sunken rocks at the northern outlet. The harbours within them, both on the main land and Vancouver's Island, are useless on account of the great depth of water and the perpendicular banks.

Nothing can exceed the beauty of these waters, and their safety. Not a shoal exists within the straits of Juan de Fuca, Admiralty Inlet, Puget's Sound, or Hood's Canal, that can in any way interrupt their navigation by a seventy-four gun ship.

The shores of all the inlets and bays are remarkably bold, so much so that in many places a ship's side would strike the shore before the keel would touch the ground. Some few of them have creeks running into them with water sufficient to turn mills. These creeks all have extensive mud-flats at their mouths, with fertile prairies at their heads and along their banks. The spring tides rise eighteen feet, those of the neap twelve feet, affording every facility for the construction of dry-docks, &c.

The country on all these salt water inlets is thought to be remarkably healthy; the winter is represented to be mild, and but of short duration, and the channels and harbours are never obstructed by ice.

CHAPTER XII.

FISHERIES AND GAME—OREGON.

In the rivers and sounds are found several kinds of salmon, salmon trout, sturgeon, cod, carp, sole, flounders, ray, perch, herring, lamprey eels, and a kind of smelt, called shrow, in great abundance; also large quantities of shell-fish, viz. crabs, clams, oysters, mussels, &c., which are all used by the natives, and constitute the greater proportion of their food. The shrow, though resembling the smelt, belongs more properly to the salmon tribe; they formerly visited the Columbia in great numbers, but are now seldom caught there; the Indians take them in immense quantities in the northern waters. This little fish is so fat, that when dried without salt and set fire to, it burns like a torch.

The salmon fishery begins in May, and lasts until October.

Whales in numbers are found along the coast, and are frequently captured by the Indians in the mouth of the straits of Juan de Fuca.

Abundance of game exists, such as elk, deer, antelopes, bears, wolves, foxes, muskrats, martens, beavers, a few grisly bears, and sifflems, a kind of rat which are eaten by the Canadians. In the middle section, or that part of it known as "rolling prairie," no game is found; in the eastern section, buffalo is met with.

The fur-bearing animals are decreasing in number yearly, particularly south of the parallel of 48°; this is owing to their being hunted without any regard to season: indeed, it is very doubtful whether they are sufficiently numerous to repay the expense of hunting them.

In the spring and fall, the rivers are literally covered with geese, ducks, and other water-fowl.

Buffalo are hunted by the Oregon Indians, as well as the Blackfeet; but the former not possessing as many horses, are not so successful as the latter.

CHAPTER XIII.

INDIAN TRIBES.

As the Indian tribes have been very fully treated of in the Ethnographical Remarks of Mr. Hale, Philologist of the Exploring Expedition, I prefer to give some extracts from his work relative to these tribes, rather than revise my own observations respecting them: these can be referred to in my Narrative of the Expedition. I feel much gratification in being able to give the observations of this gentleman a wider circulation, and to call attention to his volume of Ethnography and Philology, which, it is to be regretted, has as yet scarcely met the public eye, in consequence of the number of copies published by Congress being limited to one hundred, most of which have gone abroad, or been deposited for safe-keeping in the State libraries.

"The Indians west of the Rocky Mountains seem to be, on

the whole, inferior to those east of that chain. In stature, strength, and activity, they are much below them. Their social organization is more imperfect. The two classes of chiefs, those who preside in time of peace, and those who direct the operations of war,—the ceremony of initiation for the young men,—the distinction of clans or totems,—and the various important festivals which exist among the eastern tribes, are unknown to those of Oregon. Their conceptions on religious subjects are of a lower cast. It is doubtful if they have any idea of a Supreme Being. The word for *God* was one of those originally selected for the vocabulary, but it was found impossible, with the assistance of the missionaries, and of interpreters well skilled in the principal languages, to obtain a proper synonym for this term in a single dialect of Oregon. Their chief divinity is called the *Wolf*, and seems, from their descriptions, to be a sort of a compound being, half beast and half deity.

"The mode of life of the Oregon Indians, especially those of the interior, is so peculiar, that it is difficult to determine how it should be characterized. They have no fixed habitations, and yet they are not, properly speaking, a wandering people. Nearly every month in the year they change their place of residence,—but the same month of every year finds them regularly in the same place. The circumstances which have given rise to this course of life are the following:

"1. The territory of Oregon abounds, beyond example, in esculent roots, of various kinds, which, without cultivation, grow in sufficient quantities to support a considerable population. More than twenty species, most of them palatable, and obtainable, generally, with little labour, are found in the different parts of this territory. At certain seasons, the natives subsist almost entirely upon them. As the different species come to maturity at different times, the people remove from one root-ground to another, according to the time when experience has taught them to look for a new crop.

"2. Several kinds of fruits and berries are found, at certain seasons, in great abundance, and offer another cause for a temporary change of place.

"3. At a particular period of the year, the salmon ascend the rivers to deposit their spawn, and then the Indians assemble in

great numbers on the banks of the streams, for the purpose of taking them. Two months afterwards, the fish appear again, floating in an exhausted condition down the current, and though by no means so agreeable for food, are yet taken in large quantities, principally for winter stores. These two seasons of fishing are the occasion of two removals.

"4. The tribes of the interior depend, in part, for their clothing, on the buffalo skins which they obtain, either by barter or by hunting. And for both these purposes it is necessary for them to visit the region near the foot of the Rocky Mountains, frequented by that animal. This, however, does not, except with some of the Shoshonees, give rise to a general removal of the tribe, but merely an expedition of the principal men, their families being left, in the mean time, encamped in some place of safety.

"The tribes near the coast remove less frequently than those of the interior. Some of them spend the summer on the sea shore, and the winter in a sheltered nook on the banks of an inland stream. Others do not change their place of residence at all; but at the approach of summer, they take down the heavy planks of which their winter habitations are made, bury them in the ground, where they will be out of the way of injury, and having put up a temporary dwelling of bark, brushwood, and matting, feel no apprehensions at leaving it for two or three weeks at a time, to fish, hunt, collect roots, and gather fruit."

Mr. Hale divides the tribes inhabiting the country from the Esquimaux, on the north, to the Peninsula of California on the south, into four divisions for the convenience of description, viz:

1st. Northern Division.

2d. North Oregon Division.

3d. South Oregon Division.

4th. Californian Division.

They differ, not only in idioms, but in personal appearance, character, and usages. These classes have been formed from the resemblance they have to one another in certain general traits.

The Northern Division. "The tribes of this class inhabit the coast between the peninsula of Alaska, in latitude 60°, and

Queen Charlotte's Sound, in latitude 52°. * * * They are fair in complexion, sometimes with ruddy cheeks; and, what is very unusual among the aborigines of America, they have thick beards, which appear early in life. In other respects, their physiognomy is Indian,—a broad face, with wide cheek bones, the opening of the eye long and narrow, and the forehead low.

"From the accounts received concerning them, they would appear to be rather an ingenious people. They obtain copper from the mountains which border the coast, and make of it pipe-bowls, gun-charges, and other similar articles. Of a very fine and hard slate they make cups, plates, pipes, little images, and various ornaments wrought with surprising elegance and taste. Their clothing, houses, and canoes display like ingenuity, and are well adapted to their climate and mode of life. On the other hand, they are said to be filthy in their habits, and of a cruel and treacherous disposition."

The North Oregon Division. "All the tribes north of the Columbia, except those of the first section, and some of the Wallawallas, belong to this division, as well as three or four to the south of that river. It includes the Carriers, Qualioguas, Tlatskanies, Umpquas, Soushwaps, Flat-heads, Chickeeles, Cowlitz, and Killamukes, with the Chinooks, the Yacones, and, in part, the Calapuyas. The Nootkas, and other tribes of Vancouver's Island, also belong to it.

"The people of this division are among the ugliest of their race. They are below the middle size, with squat, clumsy forms, very broad faces, low foreheads, lank black hair, wide mouths, and a coarse rough skin, of a tanned, or dingy copper complexion. This description applies more particularly to the tribes of the coast. Those of the interior (the Carriers, Soushwaps, and Selish,) are of a better cast, being generally of the middle height, with features of a less exaggerated harshness. In the coast tribes, the opening of the eye has very frequently the oblique direction proper to the Mongol physiognomy; but in the others this peculiarity is less common.

"The intellectual and moral characteristics of these natives are not more pleasing than the physical. They are of moderate intelligence, coarse and dirty in their habits, indolent, deceitful,

and passionate. They are rather superstitious than religious, are greatly addicted to gambling, and grossly libidinous. All these disagreeable qualities are most conspicuous in the tribes near the mouth of the Columbia, and become less marked as we advance into the interior, and towards the north. It is also at the same point (the mouth of the Columbia) that the custom of compressing the head prevails to the greatest extent. The Chinooks are the most distinguished for their attachment to this singular usage, and from them it appears to have spread on every side, to the Chickeeles on the north, the Wallawallas and Nez-pérces on the east, and the Killamukes and Calapuyas on the south; the degree of distortion diminishing as we recede from the centre.

"It is not a little singular that all the tribes of this division (except the Calapuyas, who seem to hold a middle position) speak languages which, though of distinct families, are all remarkable for the extreme harshness of their pronunciation; while those of the division which follows, are, on the contrary, unusually soft and harmonious."

The South Oregon Division. "To this belong the Nez-pérces, Wallawallas, Cayuses, Moleles, Snakes, Bonnaks, Shastes, and Palaiks, and probably other tribes towards the south and east. They approach, both in appearance and in character, the Indians east of the Rocky Mountains, though still inferior to them in many respects. They are of the middle height, slender, with long faces and bold features, thin lips, wide cheek-bones, smooth skins, and the usual tawny complexion of the American tribes. They are cold, taciturn, high-tempered, warlike, fond of hunting and of all exercises requiring boldness and activity. To one ascending the Columbia, the contrast presented by the natives above and below the Great Falls (the Chinooks and Wallawallas) is very striking. No two nations of Europe differ more widely in looks and character than do these neighbouring subdivisions of the American race."

The Californian Division. "The natives of this class are chiefly distinguished by their dark colour. Those of Northern or Upper California are a shade browner than the Oregon Indians, while some tribes in the peninsula are nearly black. In other respects they have the physiognomy of their race, broad

faces, a low forehead, and lank, coarse hair. They are the lowest in intellect of all the North American tribes, approaching to the stupidity of the Australians. They are dull, indolent, phlegmatic, timid, and of a gentle, submissive temper."

The Carriers inhabit the country north of the Oregon territory, termed by the English New Caledonia; for the extent of this region, see map. The country is well watered by streams and lakes, most of which discharge themselves into Frazer's River.

"The Carriers are divided into eleven clans, or minor tribes," * * * * * * * * * "The number of persons in each of these clans varies from fifty to three hundred persons. All speak the same language, with some slight dialectical variations.

"The Carriers, though a branch of the great Chippewyan stock, have several peculiarities in their customs and character which distinguish them from other members of this family. In personal appearance they resemble the tribes on the Upper Columbia, though, on the whole, a better-looking race. They are rather tall, with a tendency to grossness in their features and figures, particularly among the women. They are somewhat lighter in complexion than the tribes of the south.

"Like all Indians who live principally on fish, and who do not acquire the habits of activity proper to the hunting tribes, they are excessively indolent and filthy; and, as a natural concomitant, base and depraved in character. They are fond of unctuous substances, and drink immense quantities of oil, which they obtain from fish and wild animals. They also besmear their bodies with grease and coloured earths. They like their meat putrid, and often leave it until its stench is, to any but themselves, insupportable.

"The natives are prone to sensuality; and chastity among the women is unknown. At the same time, they seem to be almost devoid of natural affection. Children are considered by them a burden, and they often use means to destroy them before birth. Their religious ideas are very gross and confused. It is not known that they have any distinct ideas of a God, or of the existence of the soul. They have priests, or "doctors," whose art consists in certain mummeries, intended for incanta-

tions. When a corpse is burned, which is the usual mode of disposing of the dead, the priest, with many gesticulations and contortions, pretends to receive into his closed hands something, perhaps the life of the deceased,—which he communicates to some living person by throwing his hands towards him, and at the same time blowing upon him. This person then takes the rank of the deceased, and assumes his name in addition to his own. Of course, the priest always understands to whom this succession is properly due.

"If the deceased had a wife, she is all but burned alive with the corpse, being compelled to lie upon it while the fire is lighted, and remain thus till the heat becomes beyond endurance. In former times, when she attempted to break away, she was pushed back into the flames by the relations of her husband, and thus often severely injured. When the corpse is consumed, she collects the ashes and deposits them in a little basket, which she always carries about with her. At the same time, she becomes the servant and drudge of the relations of her late husband, who exact of her the severest labour, and treat her with every indignity. This lasts for two or three years, at the end of which time a feast is made by all the kindred, and a broad post, fifteen or twenty feet high, is set up, and covered on the sides with rude daubs, representing figures of men and animals of various kinds. On the top is a box, in which the ashes of the dead are placed, and allowed to remain until the post decays. After this ceremony, the widow is released from her state of servitude, and allowed to marry again. The Carriers are not a warlike people, though they sometimes have quarrels with their neighbours, particularly the tribes of the coast. But these are usually appeased without much difficulty.

"The Sikani, though speaking a language of the same family, differ widely from the Carriers in their character and customs. They live a wandering life, and subsist by the chase. They are a brave, hardy, and active people; cleanly in their persons and habits, and, in general, agreeing nearly with the usual idea of an American Indian. They bury their dead, and have none of the customs of the Carriers with respect to them."

The Tlatskanies and Qualioquas. "These are two small, isolated bands, neither of them comprising more than a hundred

individuals, who roam in the mountains on each side of the Columbia, near its mouth; the former on the north side, and the latter on the south side. They are separated from the river and from one another by the Chinooks. They build no permanent habitations, but wander in the woods, subsisting on game, berries, and roots. As might be expected, they are somewhat more bold and hardy than the tribes on the rivers and coast; and, at the same time, more wild and savage.

"The Umpquas inhabit the upper part of the river of that name. They are supposed to number, at present, not more than four hundred, having been greatly reduced by disease. They live in houses of boards and mats, and derive their subsistence, in great part, from the river. They differ but little from the Kalapuyas, except that they have not the head flattened.

"The Kitunahas are a small tribe of about four hundred people, who wander in the rugged and mountainous tract enclosed between the two northern forks of the Columbia. The Flat-bow River and Lake belong to them. They are great hunters, and furnish large quantities of peltry to the Hudson's Bay Company. In appearance, character, and customs, they resemble more the Indians east of the Rocky Mountains than those of Oregon.

"The Soushwaps possess the country bordering on the lower part of Frazer's River and its branches.

"'The name of Atnah is given to this people by the Carriers, in whose language it means stranger, or foreigner. The Soushwaps differ so little from their southern neighbours, the Selish, as to render a particular description unnecessary. By a census taken a few years since, the number of men in the tribe was ascertained to be about four hundred. The whole number of souls at present may be rated at twelve hundred.

The Selish, or Flatheads, singular to say, do not practise the distortion which their name refers to. They inhabit the country about the upper part of the Columbia and its tributary streams, the Flathead, Spokane, and Okonagan Rivers. They number in all about three thousand souls.

"A description of the habits of this tribe will give a good idea of the life of systematic wandering peculiar to the natives of Oregon. They derive their subsistence from roots, fish, ber-

ries, game, and a kind of moss or lichen, which they find on trees. At the opening of the year, as soon as the snow disappears (in March and April), they begin to search for the pohpoh, a bulbous root, shaped somewhat like a small onion, and of a peculiarly dry and spicy taste. This lasts them till May, when it is exchanged for the spatlam, or "bitter root," which is a slender, white root, not unlike vermicelli; when boiled, it dissolves, like arrow-root, and forms a jelly of a bitter, but not disagreeable flavour. Some time in June, the itwha or camass comes in season, and is found at certain well-known 'grounds' in great quantities. In shape it resembles the pŏhpoh, and when baked for a day or two in the ground, has a consistency and taste not unlike those of a boiled chestnut. It supplies them for two or three months; and while it is most abundant, in June and July, the salmon make their appearance, and are taken in great numbers, mostly in weirs. This, with these people, is the season when they are in the best condition, having a plentiful supply of their two prime articles of food. During this period, the men usually remain at the fishing-station, and the women at the camass-ground; but parties are continually passing from one to the other. August, during which the supplies from both these sources commonly fail, is the month for berries, of which they sometimes collect enough both for immediate subsistence and to dry for winter. The service-berry and the choke-berry are the principal fruits of this kind which they seek. In September, the 'exhausted salmon,' or those which, having deposited their roes, are now about to perish, are found in considerable numbers, and though greatly reduced, both in fatness and flavour, are yet their chief dependence, when dried, for winter consumption. Should they be scarce, a famine would be likely to ensue. At this season, also, they obtain the mesaui, an inferior root, resembling somewhat in appearance a parsnip. When baked, it turns perfectly black, and has a peculiar taste, unlike that of any of our common roots. This lasts them through October, after which they must depend principally upon their stores of dried food, and the game (deer, bears, badgers, squirrels, and wild fowl of various kinds), which they may have the good fortune to take. Should both these sources fail, they have recourse to the moss before mentioned, which,

though abundant, contains barely sufficient nutriment to support life. Such is their want of forethought and prudence, both in laying up and in consuming their provisions, that there are very few who do not suffer severely from hunger before the opening of spring. Indeed, like their horses, they regularly fatten up in the season of plenty, and grow lean and weak before the expiration of winter.

"As the different root-grounds and fishing-stations are at some distance from one another, they are obliged to remove from one to the other in succession, carrying with them, on their horses, all their property. This is easily done, as their articles of furniture are few and light, and their houses consist merely of rush mats and skins, stretched upon poles. In winter they seek out some sheltered spot, which will supply their horses with food, and they then make their dwellings more comfortable, by covering the mats with earth.

"The Selish can hardly be said to have any regular form of government. They live in bands of two or three hundred, chiefly for the sake of mutual support and protection. In former times there was much fighting among these bands, but they still looked upon one another as portions of the same people. Intermarriages between these bands are frequent, and in such cases the husband commonly joins the band to which his wife belongs. This proceeds, perhaps, from the circumstance that the woman does the most for the support of the family, and will be better able to perform her duties (of gathering roots, fruit, &c.) in those places to which she is accustomed. In fact, although the women are required to do much hard labour, they are by no means treated as slaves, but, on the contrary, have much consideration and authority. The stores of food which they collect are regarded as, in a manner, their own, and a husband will seldom take any of them without permission. The men, moreover, have to perform all the arduous labours of the fishery and the chase.

"They evince strong domestic feelings, and are very affectionate towards their children and near relatives. Unlike some other tribes, they take particular care of the aged and infirm, who usually fare the best of all. There is, however, one custom among them, which seems to evince an opposite disposition.

When a man dies, leaving young children who are not able to defend themselves, his relations come in and seize upon the most valuable property, and particularly the horses, without regard to the rights of the children. The natives acknowledge the inhumanity of this practice, and only defend it as an ancient custom received from their fathers.

"In every band there is usually one who, by certain advantages of wealth, valour, and intelligence, acquires a superiority over the rest, and is termed the chief. But his authority is derived rather from his personal influence than from any law, and is exerted more in the way of persuasion than of direct command. But if he is a man of shrewdness and determined character, he sometimes enjoys considerable power. The punishment of delinquents is, of course, regulated rather by circumstances than by any fixed code. Notorious criminals are sometimes punished by expulsion from the tribe or band to which they belong.

"They had formerly, it is thought, a vague idea of a Supreme Being, but they never addressed to him any worship. Their only religious ceremonies are certain mummeries, performed under the direction of the medicine-men, for the purpose of averting any evil with which they might be threatened, or of obtaining some desired object, as an abundant supply of food, victory in war, and the like. One of these ceremonies, called by them Sumash, deserves notice, for the strangeness of the idea on which it is founded. They regard the spirit of a man as distinct from the living principle, and hold that it may be separated for a short time from the body without causing death, or without the individual being conscious of the loss. It is necessary, however, in order to prevent fatal consequences, that the lost spirit should be found and restored as quickly as possible. The conjuror or medicine-man learns, in a dream, the name of the person who has suffered this loss. Generally there are several at the same time in this condition. He then informs the unhappy individuals, who immediately employ him to recover their wandering souls. During the next night they go about the village, from one lodge to another, singing and dancing. Towards morning they enter a separate lodge, which is closed up, so as to be perfectly dark. A small hole is then

made in the roof, through which the conjuror, with a bunch of feathers, brushes in the spirits, in the shape of small bits of bone, and similar substances, which he receives on a piece of matting. A fire is then lighted, and the conjuror proceeds to select out from the spirits such as belong to persons already deceased, of which there are usually several; and should one of them be assigned to a living person, he would instantly die. He next selects the particular spirit belonging to each person, and causing all the men to sit down before him, he takes the spirit of one, (i. e. the splinter of bone, shell, or wood, representing it,) and placing it on the owner's head, pats it, with many contortions and invocations, till it descends into the heart, and resumes its proper place. When all are thus restored, the whole party unite in making a contribution of food, out of which a public feast is given, and the remainder becomes the perquisite of the conjuror.

"The Skitsuish or Cœur d'alène tribe live about the lake which takes its name from them, and lead a more settled life than the other tribes of this region. As the salmon cannot ascend to their lake, on account of the falls of the Spokane, and as these natives seldom go to hunt the buffalo, their principal subsistence is derived from roots, game, and the smaller kinds of fish. Some of them have lately begun to raise potatoes, and it seems likely that the arts of cultivation will, before long, be common among them. Being out of the usual track of traders and trappers, their character has been less affected by intercourse with the whites, than is the case with the tribes on the great rivers. They number about 300 souls.

"The origin of the appellation by which this tribe is known to the whites deserves to be noticed, as an example of the odd circumstances to which these nicknames are sometimes due. The first who visited the tribe were Canadian traders, one of whom, it appears, was of a close, niggardly temper. The natives soon remarked this, and the chief at length gave his sentiments upon it, Indian fashion, observing that the white man had the "heart of an awl," meaning, a contracted, illiberal disposition — the term awl being used by them as we sometimes employ the word pin, to denote a very trifling object. The expression was rendered by the interpreter literally "un cœur

d'alène," and greatly amused the trader's companions, who thenceforth spoke of the chief who used it, as "the cœur d'alène chief," a soubriquet which came in time to be applied to the whole tribe.

"The Pischous live on the small river which falls into the Columbia on the west side, about forty miles below Fort Okanagan. They extend along the Columbia as far down as "the Priest's Rapids." This whole region is very poor in roots and game, and the natives who wander over it are looked upon by the other Indians as a miserable, beggarly people. They have, besides, the reputation of being great thieves.

"The Nisqually, Chickeeles, Cowlitz, and Killamukes all belong to the same family: the first inhabits the shores of Puget Sound; the second the middle of the peninsula which lies west of this sound and north of the Columbia; the third is settled on the banks of the Cowlitz; and the fourth is apart from the others, on the sea coast, south of the Columbia. They differ considerably in dialect, but little in appearance and habits. Their estimated numbers in 1840 were for the Nisqually, 600; the Chickeeles, 2000; the Cowlitz, 300; and the Killamukes, 700.

"The Saptin or Nez-pérces possess the country on each side of Lewis or Snake River, from the Peloose to the Wapticacoes, —about a hundred miles,—together with the tributary streams, extending, on the east, to the foot of the Rocky Mountains. They are supposed to number about 2000 souls. In character and appearance, they resemble more the Indians of the Missouri than their neighbours the Selish. They have many horses, and are good hunters, being accustomed to make long excursions, in summer, to the Rocky Mountains, for the purpose of killing buffalo. They formerly had bloody wars with the Shoshones, Crows, Blackfoot Indians, and other tribes, whose hunting grounds were in the same region; but of late these quarrels have become less frequent.

"The Saptin are the tribe who, several years ago, despatched a deputation to the U. S., to request that teachers might be sent to instruct them in the arts and religion of the whites. Their good dispositions have been much eulogized by travellers, and there seems to be no reason to doubt that they are superior

to the other tribes of this territory, in intellect and moral qualities. There are, however, certain traits in their character that have hitherto neutralized, in a great measure, the zealous and well-directed efforts which have been made for their improvement. The first of these is a feeling of personal independence, amounting to lawlessness, which springs naturally from their habits of life, and which renders it almost impossible to reconcile them to any regular discipline or system of labour, even though they are perfectly convinced that it would be for their advantage. Another trait of a similar kind, originating probably in the same cause, is a certain fickleness of temper, which makes them liable to change their opinions and policy with every passing impulse.

"The Wallawallas inhabit the territory bordering on the Columbia for some distance above and below the junction of Lewis River. They number in all about 2200 souls.

"They resemble the Saptins, to whom they are allied by language, but are of a less hardy and active temperament. This proceeds, no doubt, from their mode of life, which is very similar to that of the Selish. Their principal food is the salmon, which they take chiefly in the months of August and September. At this season they assemble in great numbers about the Falls of the Columbia, which form the most important fishing-station in Oregon.

"The Saptins and Wallawallas compress the head, but not so much as the tribes near the coast. It merely serves with them to make the forehead more retreating, which, with the aquiline nose common to these natives, gives to them, occasionally, a physiognomy similar to that represented in the hieroglyphical paintings of Central America.

"The Waillaptu inhabit the country south of the Saptin and Wallawalla; their head-quarters are on the upper part of the Wallawalla River, where they live in close connexion with a band of Nez-pérces, whose language they usually speak in preference to their own, which has nearly fallen into disuse. They are a small tribe, not numbering five hundred souls; but they are nevertheless looked upon with respect by the tribes around them, as being good warriors, and, what is more, as having much wealth. As their country affords extensive pasturage,

they are able to keep large droves of horses, one of their chiefs having as many as two thousand. They are much of the time on horse-back, and make long excursions to the east and south.

"The residence of the Molele is (or was) in the broken and wooded country about Mounts Hood and Vancouver; they were never very numerous, and have become nearly or quite extinct at this time.

"The country of the Chinooks extends from the mouth of the Columbia River to the Dalles, a distance of 150 miles. At the period of the visit of Lewis and Clark, this was the most densely populated part of the whole Columbian region; and it so continued until the fatal year 1823, when the ague-fever, before unknown west of the Rocky Mountains, broke out, and carried off four-fifths of the population in a single summer. Whole villages were swept away, leaving not a single inhabitant. The living could not bury the dead; and the traders were obliged to undertake this office, to prevent a new pestilence from completing the desolation of the country. The region below the Cascades, which is as far as the influence of the tides is felt, suffered most from this scourge. The population, which before was estimated at ten thousand, does not now exceed five hundred. Between the Cascades and the Dalles, the sickness was less destructive. There still remain five or six villages, with a population of seven or eight hundred.

"This people may be considered the type of what we have called the North Oregon division; being that in which all the peculiarities of this class are most conspicuous. Many of the characteristics of the Mongol race appear in their forms and features. They are short and square-framed, with broad faces, flat noses, and eyes turned obliquely upward at the outer corner. The resemblance is accidentally heightened by the conical cap which they wear, similar to that of the Chinese, and which they have probably adopted as a defence against the heavy and frequent rains.

"The Chinooks are less ingenious than the natives of the Northwest Coast, but are far superior to those of California. Their habits, like those of the northern coast-tribes, show a people accustomed to derive their subsistence from the sea, and averse to wandering upon land.

"The Callapuya possess the valley of the Willamette, above the falls,—the most fertile district of Oregon. It is included between the two ridges, known as the Coast Range and the Californian Chain, and is watered by numerous tributaries of the main stream; the natives were formerly numerous, but have been reduced by sickness to about five hundred. The Callapuya, like the Umpqua, hold a position intermediate between the wild, wandering tribes of the interior and the debased, filthy, and quarrelsome natives of the coast. They are more regular and quiet than the former, and more cleanly, honest, and moral than the latter.

"The Jacon is a small tribe, numbering six or seven hundred, who live on the coast south of the Killamsikes, from whom they differ merely in language.

"The Klamet Indians live on the head waters of the river, and about the lake of the same name. They are a warlike tribe, and frequently attack the trading-parties which pass through their country, on the way to California. They seem to be engaged in constant hostilities with their neighbours, the Shastes and Palaiks, one object of which is to obtain slaves, whom they sell to the Waillaptu and the Indians of the Willamette.

"The Shastes and Palaiks live, the former to the south-west, the latter to the south-east of the Klamets. Little is known of them, except that they lead a wandering, savage life, and subsist on game and fruit. They are dreaded by the traders, who expect to be attacked in passing through their country. Their numbers, however, as well as those of the Klamets, have been of late greatly diminished by disease; and all three tribes together are supposed not to comprise more than twelve hundred individuals. The women of the Shaste, and perhaps of the other tribes, are tattooed in lines from the mouth to the chin. In Northern California, the same fashion exists among the tribes of the interior.

"The country of the Shoshones proper is south of the Lewis or Snake River, and east of the Salt Lake. There is, however, one detached band, known as the Western Snakes, near Fort Boirie, separated from the main body by the tribe of Bonnaks. The Shoshones are generally at war with the Blackfeet Indians

and the Crows. The usual war-ground of the three nations is the country around the head-waters of the Snake, Green, and Platte Rivers. Some of the Shoshones have horses and fire-arms, and derive their subsistence from the chase and from fish. Others, to the north, have no horses, are armed only with bows, and live on acorns and roots; these the hunters call Diggers, and consider the most miserable of the Indians.

"The Shoshones and Bonnaks of the Columbia, the Yutas beyond the Salt Lake, the Camanches of Texas, and some other tribes along the northern frontier of Mexico, are said to speak dialects of a common language.

"The Blackfeet Indians are a confederacy of five tribes, occupying an extensive territory in and near the Rocky Mountains, between the head-waters of the Missouri, Saskatchawan, and the Columbia. The names of the tribes are the Blackfeet proper, the Blood Indians, the Pagan Indians, the Fall Indians, sometimes called the Gros Ventres of the Prairie, and the Sussees. Of the five tribes, the first three speak the same idiom, the fourth have a language of their own, and the fifth speak a dialect of the Chippewyan. At present, they count not more than fifteen hundred tents, or about ten thousand people."

Speaking of the Southern tribes, Mr. Hale says: "The statements which were received from Indians and trappers, concerning the tribes south of the Jacon and Umpqua, were, in general, consistent as regarded their names and positions, but differed much with respect to the number and affinity of their languages. Immediately south of the Jacon are the Saiústkla, upon a small stream of the same name, which falls into the sea just south of the Umpqua. Next to these are the Kiliwatshat, at the mouth of the Umpqua, and higher up the same river, the Tsalél. South of the Kiliwatshat are the Kaus, on a small river called by their name, between the Umpqua and the Klamet. On the lower part of the Klamet River are the Tototune, known by the unfavourable sobriquet of the Rogue or Rascal Indians. Beyond these, the population is very scanty until we arrive at the Valley of the Sacramento, all the tribes of which are included by the traders under the general name of Kinkla, which is probably, like Klamet, a term of Chinook origin. According to one account, the Saiústkla, Kiliwatshat, Tsalél,

and Kaus, speak one language; according to another, two; and a third informant gave to each tribe a peculiar idiom."

The next point at which we have any distinct information about the natives is on the plains of the Sacramento, about two hundred and fifty miles from the mouth of that river, and sixty miles south of the Shaste country. Mr. Dana, speaking of these Indians, observes:—"The natives seen on the Sacramento plains, resemble Shaste Indians in their regular features. They have thick black hair, descending low on their forehead, and hanging down to their shoulders. The faces of the men were coloured with black and red paint, fancifully laid on in triangles and zigzag lines. The women were tattooed below the mouth. They are a mirthful race, always disposed to jest and laugh, and appear to have had but little intercourse with foreigners. Their only arms were bows and arrows,—and in trading, they preferred mere trinkets, such as beads and buttons, to the blankets, knives, and similar articles in request among the northern Indians."

The Indians about one hundred miles from the mouth of the Sacramento, Mr. Dana says, "have the usual broad face and flattened nose of the coast tribes. The mouth is very large, and the nose broad and depressed. They are filthy in their habits, and stupid in their looks, like the Chinooks. Throughout the Sacramento plains the Indians live mostly on a kind of bread or cake, made of acorns. The acorns, after the shell is removed, are spread out and dried in the sun, then pounded with a stone pestle to a fine powder, and afterwards kneaded into a loaf about two inches thick, and baked. It has a black colour, and a consistency like that of cheese, but a little softer; the taste, though not very pleasing, is not positively disagreeable."

Mr. Hale gives five vocabularies of idioms spoken by the natives of California, who were formerly under the rule of the Roman Catholic Missions. The first he obtained at the Mission of San Rafael, on the north side of the Bay of San Francisco, in lat. 38° 10′; the second at La Soledad, in lat. 3°; the third at San Miguel, fifty miles to the south-east of the latter; the fourth was collected by the priests of San Gabriel, in lat. 34°;

and the fifth was obtained from San Juan Capestrano, twenty miles further down the coast.

"These five languages are only a few of those which are spoken in Upper California. It is a remarkable fact, that while the interior of the country west of the Rocky Mountains is occupied by a few extensive families, the whole coast, from the neighbourhood of Behring's Straits to Cape St. Lucas, is lined with a multitude of small tribes, speaking distinct idioms. A few of these are allied to the families of the interior, but the greater number are entirely unconnected, both with these, and with one another."

Mr. Hale concludes his statements concerning the Indian tribes by the following suppositions :—

"If we might suppose that the hordes, which, at different periods, overran the Mexican plateau, had made their way through this territory, we might conclude that the numerous small tribes there found were the scattered remnants of these wandering nations, left along their line of march, as they advanced from the frozen regions of the north into the southern plains. This conjecture acquires some weight from two facts, which, though of a dissimilar character, both bear upon this point. The first is, that such a progress is now going on, particularly in the interior plains, where, according to the testimony of the most respectable traders and hunters, all the tribes are slowly proceeding towards the south. The Shoshones formerly inhabited the country of the Blackfeet, and there are old men among the former who are better acquainted with the defiles and secret passes of that country than the Blackfeet themselves. At the same period, the territory east of the Salt Lake, now occupied by the Shoshones, was in possession of the Bonnaks, who have been thrust by them partially into the south-west desert. This movement is easily explained, as resulting from the superior energy and prowess of the northern tribes, together with the general desire of attaining a more fertile country and genial climate.

"The other circumstance alluded to, is the singular manner in which tribes speaking allied languages are dispersed over this territory, in a direction from north to south. Taking, for example, the Selish family, we have the Soushwaps on Frazer's

River, and at Friendly Village, in lat. 53° 30′; the Flatheads and Pichons on the Upper Columbia; the Nisqually about Puget's Sound; the Cowlitz and Chickeeles beyond them; and a single tribe, the Killamukes, quite separate from the rest, south of the Columbia, below 45° N."

Dr. Pickering, in his volume on the Physical History of Man, divides the tribes of Western America into the Mongolian and Malay races. The former includes all those north of the Sacramento Valley, and the latter, those resident on the sea coast of both Upper and Lower California. The progress of migration to the former has been from Asia, direct by the north; to the latter, from the Sandwich Islands and Japan.

Dr. Pickering's Races of Man contain a vast deal of interesting information, and I regret that the space allotted to this memoir will not permit me to give extracts. The work itself is referred to as being one of the most interesting volumes among the results of the Exploring Expedition.

CHAPTER XIV.

GOVERNMENT.

The following is a summary of the Act to establish Territorial Government in Oregon:—

The territory lying west of the summit of the Rocky Mountains, and north of latitude 42°, is hereby organized, the rights of the United States over the Indians and their lands being reserved, the titles to missionary lands (not exceeding six hundred and forty acres to every mission) confirmed, and the power of Congress to divide or annex the territory, or any part of it, stated.

Every white male inhabitant of the Territory, at the time of the passage of this act, twenty-one years old, who is a citizen of the United States, or has on oath declared his intention to become such, and who shall take the requisite oaths, may vote, or be chosen to office, at the first election; but the Legislature may prescribe further limitations. The Governor, Justices,

Secretary, Attorney, and Marshal, are appointed by the President and Senate.

The Governor holds office for four years, and until his successor is appointed and qualified; is removable by the President; is Superintendent of Indian Affairs; may grant pardons and respites against Territorial laws, and reprieves, until the President's will be known, for those against the United States.

The Secretary holds office for five years, is removable by the President, and, in default of the Governor, fills his place.

The Assembly consists of a Council and House of Representatives. The councillors, nine in number, have the qualifications of voters, are residents of their district, and are chosen, by a plurality of votes, for three years, one-third every year. The apportionment, and the entire control of the first election, are with the Governor, but shall afterward be fixed by law. No session shall continue more than sixty days, except the first, which may last one hundred days. Representatives, in number not fewer than eighteen, nor more than thirty, with the same qualifications of councillors, shall be chosen annually, by a plurality of votes. All laws are to be submitted to Congress.

No bank, or anything like a bank, shall be chartered, or permitted to exist in the Territory as a branch of an institution chartered elsewhere, or otherwise, and the Territory shall issue no scrip; neither shall it pledge its faith, or in any way borrow money. No member of any Legislature, except the first, shall be appointed to an office created or increased in pay during his term, or for one year afterward. Salmon must not be prevented from passing up and down the streams.

Three districts shall be created, in each of which a judge, appointed for four years, and until successors be appointed and qualified, shall hold a District Court, with law and equity powers, as may be regulated by statute; and the same three judges shall form the Supreme Court, to which cases not to be tried by a jury may be removed, by appeal from the District Courts. Writs of error, and appeals from the decisions of the Supreme Court, lie to the Supreme Court of the United States, as from the United States Circuit Courts, where the matter in dispute exceeds $2000, or where the Constitution or a treaty of the United States, or acts of Congress, are in question. In

cases arising out of the Constitution of the United States, or of Territorial laws, the District Courts have the same jurisdiction as the United States District and Circuit Courts.

The Secretary of the Treasury of the United States shall regulate all disbursements of money intrusted to the Governor or Secretary. The inhabitants shall enjoy the benefit of the Ordinance of 1787. Existing laws, compatible with the Constitution of the United States and with this act, unless repealed by the Legislature, shall remain in force, except those affecting the title to land, which are void.

A Delegate to Congress, who shall be a citizen of the United States, shall be chosen by a plurality of votes.

Sections 16 and 36 in every township are set apart for the benefit of schools.

All the ports, &c., of the main-land form the collection district of Oregon, and Astoria is made a port of entry. A port of delivery may be established on Puget's Sound, and one other elsewhere.

CHAPTER XV.

ROUTES OF COMMUNICATION WITH CALIFORNIA AND OREGON.

After the view thus taken of California and Oregon, we are prepared to speak advisedly of the routes which are to connect and bind these two portions with the eastern part of the United States, and with each other. Were this the only object in constructing a communication across the continent, it would even then claim the respect as well as consideration of the statesman; but, linked as it is with the project of revolutionizing the commerce of the world, it demands the attention of every one; many may regard this, at first, as somewhat chimerical; but as the mind becomes familiar with this vast undertaking, it readily leaps over all impediments, and, by a careful examination, concludes that it is possible; and what is possible, we believe can be accomplished by Americans.

Already a plan is proposed to change the direction of our commerce with the East Indies and Pacific Ocean, still by a circuitous but shorter route than by either of the capes; individual enterprise has already sought the aid of government to foster and protect this undertaking, made possible through a commercial treaty and by grants from a foreign government; and will, in part, accomplish this grand result; but it can only be a temporary route.

All and every communication that can be opened for commercial intercourse should be advocated; and no act of congress could promote the welfare and prosperity of our country so much as encouraging intercommunications between the shores of the two great oceans which now wash our territories. The benefits which arise in a moral, political, and commercial point of view are immense; it is an undertaking well worthy of our country; and one the more it is reflected upon the more we become satisfied of its practicability and results.

Many routes have been proposed; some in view of sectional, others to subserve private interests; and others, again, have been spoken of in connection with political views; but the magnitude and results of such works are beyond all these; sectional influences change annually, nay monthly; private interests fade away; and the expenditure is too vast, and the profits too far deferred, to suit politicians. The work is of such magnitude, that it requires the voice of the nation to impel it onwards, and determine that it must be done; what greater work could or can be undertaken by a nation than "bridging the continent?" When all the results to which it must lead are considered, it far exceeds any enterprise, either ancient or modern.

The routes over the Isthmus of Panama and Tehuantepec have occupied the attention of Europe for a long period of years; and numerous examinations and surveys have been made, and many charters have been secured by individuals of different nations, as well for themselves as under government patronage, to construct canals and railroads, all which have ended in failures: it is but recently that these schemes have been revived with any prospect of success, and this has grown out of the necessity which is felt to exist throughout the whole country of having an easy and rapid communication with our distant

territories. The discovery of gold in California has turned the public attention, as well as that of congress, more particularly to it; as a temporary measure for communicating with the coast of South America and our own possessions, its construction is to be desired, and this is all it can achieve; it can go no farther, commercially speaking, with reference to the countries more remote; such additional expenses would be incurred as entirely to overcome the benefits arising from a gain of time.

As I said before, I am in favour of all routes; but my examinations of the country have satisfied me that some of these are impracticable, obstacles being interposed by nature which even the energies of a great nation cannot overcome. It will now be my object to show which of the following are practicable and which are not.

1st. The northern route, with a terminus at Lake Michigan, or some point on the Mississippi.
2d. From some point on the Missouri.
3d. From St. Louis, by way of the Gila.
4th. From New Orleans, across Texas.
5th. By Tehuantepec, through a ship canal, or railroad.
6th. Over the Isthmus of Panama.

We shall speak of these in the reverse order.

Steam can be used only for the transportation of passengers to China by the way of Panama; the rates for freight would preclude the transmission of merchandize. The distances on the Atlantic side are not beyond those wherein steam can be used, but on the Pacific, depôts for coal would become necessary at either the Sandwich or Bonin Islands, the distance being over nine thousand miles, which would require, including stopping places, some forty days as the shortest time; the quantity of fuel to be used, the costs at the depôts, &c., would probably increase the expenses so much as to render the undertaking unprofitable. The route across the Pacific from Panama offers many difficulties to sailing vessels, in the prevailing winds, calms, &c.; Panama is, indeed, one of the worst ports on the western coast to arrive at or depart from; the seasons there are divided into the fine and the rainy; the former, or what is called summer, though in north latitude, is from December to May, and only during this period is it advisable to

approach this coast. In the rainy or winter season, from June to November, every part of it is liable to hard gales, tornadoes, or heavy squalls, succeeded by calms and deluges of rain, and the most dangerous lightning. Sickness begins at Panama as early as March, and continues until December; and with the exception of the fine season, the whole coast in its vicinity may be described as dangerous, and on every account to be avoided. From December to May, the prevailing winds are from the north and north-west, the remainder of the year they blow from the north-east, south-east, and the west; but are at all times uncertain, and calms frequently prevail; vessels may be detained on their passage, from these causes, so long as to make this route of greater length than that now followed by the China-trade.

As a means of communicating with the western coast of South America by the agency of steam, too much value cannot be laid upon the proposed railroad across the Isthmus. The obstacles and difficulties presented by the harbours and rivers on both the Atlantic and Pacific sides have long been known both to the English and French admiralties, and equally applies to both of these routes. There is another view of great force in a political light. The whole of the capital for construction will be drawn out of our own country, and we will be building up, by making these expenditures, commercial depôts to rival our own cities, and remove the channels of trade from us altogether, to the prejudice of our own country and its citizens. For ten years it may be advisable to use one of these routes, or until such time as the routes through our own territory can be completed and in operation; but it can never satisfy the wants of the nations, or preserve those advantages we should look forward to obtain.

Next in order is the southern route by railway across the country, by way of the Gila. The recognisance of the country through which this would pass has been fully made known to us by Colonel Emory, and his report shows that it would be nearly impossible for this purpose. The altitude of the mountains is in itself sufficient to decide the question; but if we grant that this can be overcome, the sterile country through which it would run brings conviction to the mind, that if it is

not impossible it is certainly unadvisable. It can never become an inhabited country, therefore one great object in the construction of a railroad would be lost. Again, if this last fact were not the case, the proposed terminus on the Pacific at the port of San Diego would never accommodate the trade, and half or two-thirds of the ships would not be able to enter. The port is inadequate for the commerce that such an intercourse would bring about; and the country around can never furnish the necessary supplies. The proposition for terminating it at San Francisco is equally objectionable, and amounts to an impossibility on account of the high mountain ranges which surround it.

Whether this road is to start from St. Louis or Texas is immaterial. The same route by the Gila is to be followed; and of course the same objections exist to both.

From the thirty-third to the forty-second parallel, there is no route by which the mountains can be avoided, and the great arid plains would also present insuperable obstacles. There are three ranges of high mountains traversing from north to south three parallels; the Anahuac, Wahsatch, and Californian, all equally impassable; and the last, in particular, shuts out all communication with the "El Dorado" and its port.

We now come to the last or most northern route. Nature here invites the enterprise. The distance is the shortest; it has few if any difficulties to overcome; the lands it would pass through are some of the best in the western country; and the greater part of the whole distance can become densely populated, and opens out an entirely new country, towards which our own population and the emigrants are even now wending their way in tens of thousands, seeking a quiet home from the troubles of the old world.

The northern route contemplated has a delightful climate, suitable for the full development of the human frame, and all the accompaniments of civilization. It has been found by examination to be practicable throughout the whole distance, and at its western terminus there are excellent ports. All the great barriers on other routes are on this line either modified into gentle hills or rent asunder, and the way is thus made clear for the undertaking. The construction of this road across the

head-waters of all the great rivers, touching the limits of their navigation, will at once satisfy any one of the advantages to be derived from it, adding to the inland commerce by transporting the products brought on this "iron river" from the remotest ports of the globe to all the cities, towns, and landings on the vast waters of the Mississippi and its tributaries. At the same time it would connect with all our sea-ports by the railroads that are now constructing towards its northern and eastern terminus, while it would also be the means of furnishing the whole extent of our Atlantic coast, including even Canada, with all they desired of the productions of the east, and carrying back in return their merchandize in exchange. It must be readily seen that all parts of our extended country would equally participate in its advantages, and none more so than the southern and western states, whose railroads and navigable waters would all be so many paths by which the trade that must flow through such a channel would circulate. The general Government would be equally benefited, by the increased value it would give to all the public lands on either side of it.

The terminus on Lake Michigan would enable the large supplies required for the persons employed, as well as the materials, to be forwarded with great economy as well as facility of transportation, and secure the necessary timber for the construction of the road. The country for the first eight hundred miles is admirably adapted for the purpose, offering no impediments whatever; and after this distance such a route will offer as to place the whole country on the eastern slope of the Rocky Mountains subservient to its use and support,—a portion of the country, from the accounts of those who have visited it, surpassed by none in fruitfulness or climate. The passage through the mountains is known to be without difficulty, and the course to the point of its destination almost a direct line until the lower waters of the Columbia are reached, when a short divergence brings it to a terminus on the waters of Puget's Sound,—as I before remarked, one of the most noble estuaries in the world; without a danger of any kind to impede navigation, with a surrounding country capable of affording all kinds of supplies, harbours without obstructions at any season of the year, and a climate unsurpassed in salubrity.

In looking beyond this continent, we find equal advantages existing in the communication with China and the eastern islands, not only by steam but by sailing vessels, the winds being favourable both ways. The passage to China would be made with the assistance of the *trades*, and the return voyage by the aid of the *variables* in higher latitudes. No country is so well situated to communicate with all parts of the Pacific Ocean as Oregon, and for advantages it is equal to any, whether considered under the head of agriculture, commerce, or manufactures. Oregon holds that position with regard to the Pacific and its islands which must ever make it a ruler of its commerce; and when once a direct communication with it has been opened from the eastern side of the continent, it must receive the aid, both in capital and emigration, to rise quickly into importance, and its weight to be felt throughout that ocean.

No one can entertain any doubt but that the road can be built. The number of miles of railroad that have been constructed within the U. S. in the last fifteen years is nearly 6000, on which have been expended upwards of 70,000,000 dollars. This alone would satisfy any one, and shows conclusively that the task is by no means difficult, and, with the experience we now have in their construction, one of easy accomplishment. The lands to be granted furnish the capital, and therefore there need be no delay or unnecessary expenditure of time to secure a direct intercourse with the extreme western portion of the United States.

Look but at the advantages to our country. The benefits to be derived from it would be equally shared by all parts of it. The commercial community would be benefited, by changing the current of the trade from the East Indies through our territory; our manufacturers, by having a speedy and safe transit for their wares; our agriculturists, by the interchange of their products, and receiving their supplies unincumbered with the amount of high freights they now pay; and from the facility and celerity of the intercourse, they would obtain articles of which they are now deprived by their distance from any seaboard. This alone would create an internal commerce that would be of great advantage to all parts of our extended country, and cause an interchange of feelings and associations that would be

highly beneficial in promoting intercourse and good will. The expense attending the lengthened cruises of our whalers would be materially lessened, and our supplies in the articles furnished by them would be drawn from the western coast; as this must become the point from which the fishery will be carried on, and where it can be done so much more effectually and economically.

The overland mode of transporting the mail and passengers strikes us as one of the most feasible to meet the immediate wants of the country, and will add many facilities to the operations of building the railroad, making us familiar with the difficulties and the best modes of obviating and overcoming them. It will open at once, or within the year, both a speedy and safe route to Oregon and California; much sooner than by any other way that has been proposed, and as a temporary expedient the best that could be adopted to open and keep up our communications with those territories.

The route from the Missouri by the Platte or Kansas through the South Pass is too sectional, and would pass through a country throughout nearly its whole extent uninhabitable. It would be below the head-waters of all the rivers, where there could be no bridging of the rivers, and the public lands could not suffice to build the road, neither would any portion of them be at all benefited by it; and the whole northern section of our country be deprived of any advantages to result from its construction, which would be almost equally the case with our south Atlantic states.

The northern route pointed out by Mr. Whitney, by whose energy and perseverance this great scheme has been brought before the country, has been well selected, and every consideration duly weighed relative to its practicability. The plan he proposes, and which by untiring assiduity he has presented to various legislatures of the States, has received the approbation of two-thirds of them, who have requested their delegations to vote for it. Various objections have been raised to his proposition, but most of them are of little or no force. In a novel undertaking of the magnitude of this, it is to be expected that opposition will be met with.

The question seems simply to be, Can the cost of the work

be defrayed by the sale of the lands? Many well-informed and prudent persons believe that it can, and numerous men of capital and enterprise are willing to embark in the undertaking.

The Government, by the bill reported in Congress, is fully protected in every way against loss or damage; so much so, that if Mr. Whitney or his copartners should fail to carry on the work, or not comply with the terms of the grant, (if grant it can be called, where valuable consideration is given in return,) that portion which has been completed would be forfeited to the Government.

The Committee, in their bill, provide that the Government shall receive ten cents an acre for the land, much beyond what it has cost the country, in the extinguishment of the Indian titles. The benefits to accrue to the public from the labours of the enterprising gentlemen who will embark in this work would, it appears to me, be ample remuneration for the lands, and entitle them to all they can earn, if the road is completed: the advantage to the Government in the increased value of the lands that would be brought under sale, will be more than an equivalent for those that are to be devoted to the construction of the road.

The route to be passed over is peculiarly well adapted for the construction of a railroad; there are but few rivers to bridge, and those that will require it, offer all the facilities needed. The distances and arguments in favour of this route have been so fully stated in Mr. Whitney's memorial to Congress, and in the several reports of the committees of that body, that it is needless to repeat them.

It has been suggested that this work ought to be undertaken by the Government itself. Private enterprise, in celerity, far exceeds any operations of the Government, and is much more economical and effective: if the Government undertook it, the sale of the lands would never meet the disbursements, and the work would linger on for years; the difficulties to be encountered by delays in appropriations, the transaction of the business at the seat of Government, and the precautions necessary in the construction of works by Government contracts, would alone retard its completion much beyond the period in which it ought to be finished. From the above remarks, I hope it will

not be supposed for a moment that the talent and energy of the distinguished corps of the army, to which such duties appertain, is called in question; it is the system alone under which they are obliged to construct the public works that causes such delays. The only true way for carrying out this work is by private enterprise, under the protection of Government.

Some may doubt the practicability of transporting merchandize across a railroad at sufficiently low rates to make them cheap to the consumer; but that this can be done at the present rate of toll is, I think, entirely settled by the experience we have had in this country on many of our roads; and it is admitted that the minimum cost of transportation is not yet reached: there, therefore, can be little doubt that a road which seeks alone to be reimbursed for management and repairs, and whose tolls will be under the control of the nation, will be able to transport as cheap, if not cheaper, than any which is expected to pay a dividend. The speed of transportation of passengers and freight is now well ascertained; the transit of both can no longer be considered doubtful; it must result in economy and ease; so much so that the journey to the shores of the Pacific will be made both for business and pleasure; and they may be reached in as short a time as those of the Gulf of Mexico from our northern cities.

No one can fail to see the necessity of some communication being opened by land between Oregon and California. In examining the routes, nature seems to have placed considerable barriers to such a communication in the mountain ranges, which cross the country between the two territories at right angles, creating a series of ridges which rise to the height of 1000 or 2000 feet, which are often so steep as to render it difficult for the Indian trails to be followed. Such communication can only be opened by the government: there are two routes which offer; one is on the west side of the Cascade Mountains, and the other on the east; the former has greatly the advantage in point of climate, as it would seldom be interrupted by snow; but towards its junction with the Sacramento valley, the country is so rough that it would be difficult to construct a wagon-road. The route on the east side lies through the middle section, between the mountain slope and the course of the Chûtes, or Fall

[illegible] might be travelled part of the way by wagons, [illegible] difficulty; in crossing the branches of the river, which run in deep chasms, these could, however, be easily bridged. The country rises towards the south, to the high table-lands of the Great Basin, and would not be passable for several months in the year, from the snow and frosts. It will be many years before these routes are needed. The communication between Oregon and California by sea is much less difficult, and shorter, and is practicable throughout the year; and the line of mail steamers recently established on the north-west coast will effect all that the commercial and postal arrangements may require for some time to come. The distance between Puget's Sound and San Francisco is not much greater than between New York and Savannah, and may be easily accomplished in four days. The hazard and uncertainty of crossing the bar of the Columbia, even by steamers, prevents it from being used.

CHAPTER XVI.

GEOLOGICAL STRUCTURE OF OREGON AND UPPER CALIFORNIA.

Believing it will prove satisfactory to many, I gladly avail myself of the volume of "Geology of the Exploring Expedition" by Mr. Dana, just issued from the press; it is replete with information upon the geology of Oregon and California, and gives many facts to show the structure of that portion of the United States; the more so as this valuable work is destined to have but a very confined circulation, only a small number of copies having been printed. This, I hope, will be the means of its becoming more extensively known; those who are desirous of a more intimate knowledge, I refer to Mr. Dana's volume on the Geology of the Exploring Expedition, printed by Congress. Mr. Dana was one of a party from the Expedition that travelled from the Columbia to the Bay of San Francisco, through the Sacramento valley. The party did not pass within forty miles of the locality where gold has been lately discovered;

but his account of the formation of both territories will throw much light upon the subject of auriferous rocks.

"The most striking peculiarity in the geological structure of Oregon is the abundance of basaltic or volcanic rocks over its surface, both in the vicinity of the lofty cones of the Cascade Range, and elsewhere through the territory. The region more especially thus characterized, includes the greater part of the inner section, and the Columbia River, Willamette, and Cowlitz districts in the coast section. But beside basaltic rocks there are, in the districts last mentioned, tertiary sandstones and shales, and basaltic conglomerates, prevailing to a very large extent, and continuing some distance—the limits yet undetermined—up the Columbia. There are also granite and allied rocks along with serpentine, besides some ancient conglomerates and shale in the Umpqua and Shaste regions, and in different parts of the Cascade and Coast Range at a distance from the volcanic peaks.

"The tertiary rocks are first seen on the Columbia in the vicinity of Astoria. They occur along the shores of this river for twenty miles from the sea, though occasionally interrupted by basalt, as at the settlement Astoria. They are met with over the country of this part of the Columbia towards Swalalahos;* but among the sandstone hills of this region are others of basalt; and Swalalahos itself is the remains of an ancient volcanic mountain or crater, consisting principally of volcanic conglomerate. These sedimentary deposits prevail to the north of the Columbia, and upon the shores of Puget's Sound.

"Above the lower twenty miles of the Columbia, the banks are mostly basaltic; and in some places these rocks constitute a long wall or palisade, nearly bare, from one to three hundred feet high. Basalt continues to be the rock of the river, except where the shores are alluvial, as far as the forks, though for a portion of the distance it is interstratified with basaltic conglomerate or tufa. Alluvial shores occur for a long reach above the mouth of the Willamette. Twenty miles east of Vancouver the basalt begins again to line the river, and six miles beyond it stands out in needles and slender cones, forming what

* A mountain lying about twenty miles east of Astoria.

is called Lower Cape Horn. At the Cascades, forty-five miles from Vancouver, the basalt is very cellular, and in some places a scoriaceous lava. Both here and at the Dalles the basaltic rocks are associated with basaltic conglomerate. Thirty-five miles above the Dalles, commences a flat country, which continues for sixty miles to the Grand Rapids. Ledges of basaltic rock crop out at intervals along these low shores; and at the Grand Rapids, they stand in high broken walls, peaks and needles, on both sides of the river. These rocks cease again at Wallawalla, twenty miles beyond.

The rock of the banks of the south fork of the Columbia are basalt as far as the Koos-kooski, and the Snake River Range is characterized by the same basalt, either cellular or compact, and basaltic conglomerate, with intervals of basaltic leaves.

A party from the Expedition crossed the Cascade Range to the north of Mount Rainer, and observed granite twenty miles from Nisqually; pebbles of granite and porphyry were also seen in the streams. Near the summit of the Cascade Range the rocks are trachytic, and contain black crystals (probably hornblende).

The rocks on the line from the head of the Spipen to the Columbia, at the mouth of the Pischons, consist of basalt, much of which is very cellular. The underlying rock on the west side of the Columbia is a fine-grained granite, where the basalt was observed overlying on the east side, of a thickess varying from one to four hundred feet. Basalt extends over the great portion of this interior part of Oregon; it has been observed beyond the Grand Coulée, on the borders of De Smet's Lakes, near the centre of this extensive prairie. The Grand Coulée shows the structure of the country: at its northern end granite is the underlying rock, and the basalt is above, whose thickness is equal to that on the Columbia.

The country north of the Columbia, as it trends east from Okonagan, is mostly composed of granitic rocks, and this appears to be the line where the eruption of basalt ceases.

Granite has also been traced to the east, sixty miles south of Colville and the Spokane, and to the west, on the north side of the Strait of De Fuca.

Quartz rock, containing a little mica, is seen at Kettle Falls,

near Colville, and granular limestone is reported as occurring at the mouth of the Spokane River.

Between the Spokane, Koos-kooski and Lewis Rivers, nothing was discovered but basalt; this is also the prevailing rock to the north of the Columbia, as far as the Dalles, and along the course of the Yakima.

Specimens of rocks from the north-west coast, and New Caledonia, were seen at Vancouver by Mr. Dana, but the particular localities were not known: he characterizes them as "garnet in trapezohedral crystals two-thirds of an inch in diameter, of pyrites in cubes, chalcedony, opal, kyanite, graphite, oxides of manganese and iron, besides different varieties of granite, serpentine of light and dark shades, calc spar, argillite, and compact and porphyritic basalt.

"At the Willamette Falls, the rock is a cellular lava, in some parts nearly scoriaceous. Over the plains and rolling prairies to the Elk Mountains, the tertiary sandstone and shale are intermingled, as near Astoria, and the same rocks constitute these mountains at the pass, and the country onward to Elk River. Between the Elk and Umpqua Rivers, basalt and tertiary sandstone occur in alternate hills.

"At the Umpqua River, the first granitic series of rocks is met with, in passing from Oregon to California. Talcose rock is largely developed, and is the principal surface rock on the way to the Umpqua Mountains. A considerable region of an older secondary conglomerate—a siliceous pudding-stone—is found on the south fork of the Umpqua. The Umpqua Mountains consist of talcose rock, some portions of which are slaty.

"Twenty-five miles south of the Umpqua Range, we passed a region of hornblende rocks and syenite. Twelve miles farther south, as we approached the Shaste, the rock was granite, and the same was found on the south side. We here deviated from our southerly course, and for fifteen miles followed the banks of the river eastward, passing soon into a region of hornblende rocks, some of which were imperfect syenite. After making about twelve miles of easting, we again turned south, and twenty miles beyond reached a wide prairie. A few outcropping basaltic rocks were crossed as we entered it, and hills, apparently basalt, were seen to the eastward; but, in our

course, after travelling ten or twelve miles, we reached a region of granitic hills. A short distance farther south, we crossed what we designated the Boundary Range; it consisted of basaltic sandstone or conglomerate, and what appeared to be the Astoria tertiary sandstone, containing fossils. Southward, the basalt and sandstone run side by side nearly to the Shaste Mountains. Fronting the Shaste Peak, the plain is covered with hillocks of a porphyritic lava, while the hills to the westward consist of sandstone, and then change to serpentine and syenite.

"Entering the Shaste Mountains, we travelled for twenty miles over trachytic rocks, then passed to granite, which graduated into syenite, hornblende rock, hyperstene rock, protogine, talcose rock, and talcose slate. The talcose rocks constitute the greater part of the ridges along the upper part of the Sacramento valley. During one day in the Shaste Mountains, we passed over a formation of shale, sand-stone, and pudding-stone of early origin.

"On the plains of the Sacramento, nothing but alluvial deposits are met with, until reaching the Sacramento Bute, eighty miles north of San Francisco, (or about one hundred and fifty miles by the river.) The Bute is an ancient crater, and consists of trachyte and trachytic porphyry.

"Near the head of the bay of San Francisco, the rocks are composed of a soft sand-stone, like that of Astoria. From this point to Sausalito, and from thence to the sea, the hills consist of red and green chert and shale, which are subordinate members of the talcose rock formation. Some beds of soapstone and talcose slate, with actinolite, and an impure serpentine, exist on the borders of the bay."

After this general description of Oregon and the route travelled over by him, Mr. Dana describes the mineral character, &c., more particularly.

"The granite of the Shaste region is mostly albitic; it is very light-coloured, and along the beds of streams, often has the whiteness of chalk.

"In the Shaste Mountains it is a fine-grained rock, containing colourless quartz along with the albite, besides scales of mica, which are black in the common variety, though occasion-

ally silvery. At other localities, the mica is wholly wanting, and the rock is a granular mixture of albite and quartz. Albite and feldspar were contained together in much of the rock; the former being easily distingnished by a flesh-red colour, while the latter is white. This feldspar is usually in coarse crystals, measuring sometimes half an inch by an inch and a half. This rock is therefore an albitic granite porphyritic, with feldspar.

"True granite, containing no feldspar, occurs sparingly in the Shaste Mountains, and more abundantly near the Shaste River, where some of it is coarsely porphyritic, with but little mica and quartz. The mica of the rock is in wedge-shaped scales.

"These granites are handsome, durable rocks, and have no trace of a schistose structure. A gneissoid variety, passing into a gneissoid mica slate, was, however, met with in the granite ridge fifteen miles south of the Boundary Range. The granite at this place is almost purely a mixture of feldspar and quartz. No true gneiss was seen in the Shaste Mountains.

"Not less common than either of the above varieties is a granite containing small grains or crystals of hornblende in addition to the mica. The hornblende is in some cases very sparsely disseminated, and there is an imperceptible gradation from this kind to a fine-grained syenite, in which the mica is wholly replaced by hornblende. Both feldspathic and albitic granites show these transitions. This syenitic rock contains the hornblende in large shining crystals, an inch or two long, near the entrance to the Shaste Mountains, about twenty miles north-west of the peak. The light and dark green crystals, contrasting with the white albite, make a handsome rock. Many of the syenitic rocks contain little or no quartz.

"In the Shaste Mountains, a fine-grained, nearly compact, porphyritic rock is met with, of a grayish colour, formed of an intimate mixture of albite and quartz speckled with points of hornblende, and spotted white with crystals of albite a fourth of an inch long. This grayish rock, hardly granular in texture, has little resemblance to the other syenites or granites, though intimately associated with an albitic granite.

"A rock consisting wholly of greenish-black crystals of hornblende was occasionally met with in the Shaste Mountains; and

also a variety containing acicular crystals of white hornblende or tremolite.

"There are other compact hornblendic rocks, black and uncrystalline, which are but a step removed from the syenites, although very unlike in appearance; for we find the transition through a variety in which the hornblende is partially crystallized. The rock is tough, and looks somewhat like certain compact basalts, but is much harder, and breaks with sharper edges. It gives extremely rough features to the landscape. This rock occurs upon the Shaste River, near where the party diverged from it to go southward. It is much fissured and cracked, without any appearance of regularity of structure; and owing to this peculiarity, the action of the weather or of water, instead of smoothing down the points and crests, only makes them more rugged. A slaty structure is only imperfectly developed in a few isolated spots of small extent.

"The syenites and compact hornblendic rocks also pass into a compact hypersthene rock, which is abundant along Destruction River (the head waters of the Sacramento), in the Shaste Mountains. It occurs of various shades of gray, green, and brown; and the worn masses appear spangled with the pearly crystallization of the light grayish-green hypersthene. Hypersthene and hornblende are different varieties of the same mineral, the former having a pearly or sub-metallic lustre.

"The talcose rocks of this region have seldom the usual schistose structure; they are generally compact, and irregularly fissured, like the hornblendic rocks above described. These compact varieties contain little talc, or graduate into a siliceous homogeneous rock, breaking with a smooth surface, consisting probably, for the most part, of feldspar and silica, or of silica alone, excepting some included clay.

"A fissile variety, having imperfectly the lustre of talc, occurs in some of the ridges of the Umpqua Range; it is a grayish-green, or grayish-white rock, too fragile and soft to break out in slabs. It occurs along with the hard compact rock alluded to. This compact rock has a grayish or olive-green or brownish colour, with none of the greasy feel of talc, and breaks into angular fragments, four or five inches through. No trace of crystallization could be distinguished, except in the quartz veins,

which thickly intersect it. It contains little or no talc, excepting as colouring material, and it is possible that the colour may be owing to a trace of hornblende. Other portions of the rock are nearly pure silica.

"In the Shaste Mountains, there is a talcose slate of a dark grayish-black colour, breaking into thin slates with a fine surface, and but slightly greasy in feel. This slate graduates into a compact rock, resembling that just described. The colours of the latter, besides those stated, are often light bluish-green, and greenish-white or grayish-green; and when forming the bed of a river, the waters have consequently the same mellow tint. Veins of milky quartz are common. This greenish rock would be called prase, in hand specimens, and is often more or less translucent, with a smooth conchoidal fracture. It is very siliceous, consisting probably of silica and feldspar, with a trace of colouring material; yet the feldspar is nowhere in crystals or grains, and in much of the rock must be sparingly present. We may distinguish it as *pyrasoid rock*, for it is abundant wherever the talcose formation occurs. Fragments of handsome prase are occasionally met with in these regions, which have sometimes the oily surface of tale.

"A light greenish variety of this rock, near San Francisco, is associated with red and yellow jasper; some hills consist wholly of the latter material, while in others both the green and red rocks are associated, showing, by their gradations, the close relation between the jasper and the prase rock.

"A variety resembling bloodstone is also met with at times; it has a dark greenish colour and jasper-like fracture, though no specimens were seen with the red spots of true bloodstone.

"From the transitions here pointed out, it appears that the jasper and prase rocks are closely connected with the talcose series, and that the translucent prases and bloodstones here found are only varieties of its condition.

"A *chloritic* rock occurs on the northern declivities of the Umpqua Mountains, closely associated with the talcose varieties, and forming part of the same series. It is a granular olive-green rock, and is speckled white with feldspar. It resembles some greenstones. It is rather soft, and breaks readily with a rough surface. Isolated masses of foliated chlorite some-

times occur in this rock, and are generally associated with interlaminations of quartz. A prasoid variety, in the same region, has a light grayish-green colour, compact texture, and smooth fracture; it contains disseminated grains of quartz. The quartz may be seen gradually disappearing or blending with the mass, and the transition may thus be traced to a green jasper or prase.

"No granular steatite of good quality was observed in place. An imperfect soapstone was occasionally met with, and fragments of a purer kind occur in the Shaste Mountains, leaving little doubt that large beds may yet be discovered. These fragments were of a grayish-green colour, and had the usual characters of this rock. On the north shores of the Bay of San Francisco, near the prominent point in the straits, just east of Sausalito Harbour, there is a steatitic rock intermediate between three steatite and laminated talc. It is a fragile, soapy rock, breaking irregularly into curved or lenticular laminæ, apparently indicating an approach to a concentric structure. The colour is gray or grayish-green, sometimes mottled with darker shades of green. Round and semiangular masses of a dark green rock, resembling serpentine, are imbedded in the bank of talc rock; they are harder than ordinary serpentine, yet have the same features and fracture. Large portions of the bank, in some places, consist of this impure serpentine. The talc rock near by on the shores passes into a talcose state, very evenly fissile. The slates have the greasy feel of talc, and are of various colours, as white, gray, green, brown, and dull black; they have a speckled appearance, owing to the dissemination of talcose spots of a lighter shade than the colour of the slates. Some of the slates contain actinolite in slender crystals, and large nests of this mineral are not uncommon near the first locality mentioned, presenting radiated and fanlike crystallizations.

"A *protogine* or *talcose granite* is another of the varieties connected with the talcose series. It was met with in the Shaste Mountains, having milk-white and grayish colours. One variety consisted of quartz and albite, with sufficient talc to give the rock a greasy lustre. Another variety, resembling much a granite, was composed of white quartz and yellowish feldspar

in rather coarse grains, with spots of chlorite or olive-green talc. The rock is not durable, owing, in part, to some iron in its composition, which rusts on exposure, and colours the rock red. This protogine may be seen passing into the common talcose or prasoid rock, with which it occurs, and not into granites. It occasionally contains yellowish or greenish-white pieces of a compact material, appearing like an imbedded fragment of indurated clay.

"Much of the hornblende schist in the Shaste Mountains contains talc, and specimens of both hornblende and talcose rocks may be collected, in some instances, from the same square rod. Some portions of the diallage rocks are also talcose.

"Serpentine is largely developed in high ridges to the northwest of the Shaste Mountains, where it has the softness and translucent edges that usually characterize this mineral. The general colour is a dark green; but it is sometimes mottled with a light grass green, and green diallage is abundantly disseminated through certain portions of this rock. There are also seams of amianthus or asbestus. This rock is also found in the Shaste Mountains, but where examined by the writer it was a harder variety; it may be traced in its passage into the ordinary talcose rock. Its colours are often varied like verd antique marble.

"From the above descriptions it is obvious that all the rocks enumerated, from the serpentines to the granites, belong to one and the same series. In the Shaste Mountains, the pure albitic and feldspathic granite may be detected receiving at first a mere sprinkling of hornblende points among the scales of mica. These pass into syenites, and the syenites into hypersthene rock, and into a compact hornblendic rock which has no trace of crystallization. The passage to talcose rocks is equally distinct and gradual. Both the granite and hornblende rocks become, at times, very gradually talcose, so that it is often difficult to say whether the rock should be classed with the talcose series or not. The talcose rocks graduate as imperceptibly into the prase rock, in which the talc is nearly or wholly wanting; and this again into the red and yellow jaspers. The transition to serpentine from the hornblendic and talcose rocks has been mentioned. The diallage of the serpentine is nothing but horn-

blende, and seems to correspond to the hornblende crystals in the syenite. The mineral hornblende is common in most serpentine rocks, either as asbestus, actinolite, or diallage. We have described an imperfect serpentine in the talc near San Francisco, and mentioned that actinolite occurs abundantly at the same locality; indeed, the serpentine at this place appears to owe its hardness to an excess of hornblende in its composition. At the same localities, the green and red cherts, or jasper, occur along with the talcose slates.

"The talcose formation was first met with, travelling south from the Umpqua; next we came upon syenite, then true granite, upon the Shaste River. Leaving our southerly course, and travelling eastward on the Shaste, we passed again to the hornblende rocks, syenitic and compact. Returning to our southerly course, after twenty-five miles, we again fell in with granitic rocks, at first passing over gneiss, and soon after, granulate and some true granite. The granite continued to the Boundary Range, where it was syenitic.

"After passing a region of basalt and sandstone, in the vicinity of the Klamet, we crossed a prairie covered in many parts with pebbles from the talcose formation; then the foot of a ridge of serpentine; and then entered into a region of syenite at the foot of the Shaste Mountains. For twenty miles in these mountains, these rocks were interrupted by trachytes; yet a few pebbles or stones from the talcose formation were found in the narrow beds of small mountain streams. Leaving the trachyte, boulders of talcose rock and syenite occurred abundantly along the head waters of the Sacramento; and within a mile, granite boulders were intermingled. A mile beyond, granite became the prevailing rock; and at the centre of the granite region, lofty pinnacles and needle peaks peered above the forests around, to a height of three thousand feet. From granites and syenites we next passed successively to hornblende rocks, talcose and prasoid rocks, with protogine and some serpentine. The rocks of the talcose series constitute the greater part of the ridges about the head waters of the Sacramento, to the emergence of the stream from the mountains. The protogine in the talcose region was met with about fifteen

miles before reaching the Sacramento plains. Talcose rocks and slates were again met with near San Francisco.

"In this route we three times passed from talcose, through hornblendic regions, to granite, or its next akin, syenite; and as many times returned again, nearly in the same order, to compact talcose or prasoid rocks.

"The great preponderance of talcose rocks, and others related, having a prasoid character, is another fact of interest; it is but part of a still more general fact,—the great preponderance of this part of the Plutonic series over the globe. Although we have not specific facts and localities, we have sufficient evidence, from specimens examined, that it is abundant in New Caledonia to the north of Oregon. The serpentine, soapstone, and the material, carved into pipes by the Northwest Indians, appear to come from this formation. The greenstone, usually called jade, used for ornaments, and also in making hatchets, probably has a similar origin.

"The relation of serpentine to other rocks of the series, is also placed beyond doubt by the facts observed.

"The hornblendic and talcose rocks are rarely schistose; and when this structure is apparent, it is seldom retained long enough to show the direction of the layers. The cleavages of the talcose argillite in the Shaste Mountains were often vertical, with numerous windings and contortions, and they varied from perpendicularity to a dip of sixty degrees.

"The structure of the jaspery rock of San Francisco is worthy of description. The green, red, and yellow varieties occur in the same vicinity; they form a series of layers, averaging two inches in thickness, and varying from half an inch to four inches. The layers are very distinct, and are partially separated by open seams, and on the fronts of bluffs or ledges the rock has consequently a riband-like appearance. The layers often coalesce and subdivide, without regularity, though uniformly parallel. They are frequently twisted, and thus change, at short intervals, from a vertical position to a dip of twenty degrees. The colours, red and yellow, are often mingled, and sometimes appear as parallel bands. In some instances the surface is red, while the rock is yellow beneath: this has resulted from the burning of a tree on the spot; for by

heat the yellow variety readily changes to red. A small specimen of the green variety had an agate-like structure, as if it had been formed from an aqueous solution.

"The granitic regions of South Oregon are mostly covered with a dry gravelly soil or fine sand, from the granulation of the material instead of its decomposition. The sterile sands near the Shaste River, and over the country for fifteen miles north of the Boundary Range, arise from the disintegrated granitic rocks. The contrast of granitic and basaltic soil was strikingly displayed in the latter region: we passed abruptly from the unproductive sands of the feldspathic granite to a mellow loam, arising from a basaltic dike. The dike was half a mile wide; and on leaving it, the transition was as abrupt again to granitic sands.

"The compact horneblende and talcose rocks undergo slow change, and give a rough, bristly appearance to the country, owing to the many projecting points of ragged rocks. The plains in the vicinity of these rocks are strewed with pebbles they have afforded, among which there is a large proportion of milky quartz, from the veins or seams. The soil from these works is at once distinguished by its harsh gravelly character, and a pale brick-red colour. The semi-translucent prase on exposure becomes opaque-white, showing that, although nearly as hard as quartz, there is still some other mineral, (probably feldspar,) in its composition.

"With regard to the *mineral productions* of the rocks described, we have only the negative fact that nothing of interest has yet* been discovered within the limits of Oregon and California. The talcose and allied rocks of the Umpqua and Shaste districts† resemble, in many parts, the gold-bearing rocks of other regions: but the gold, if any there be, remains to be discovered.

"The ancient sandstone, shale, and conglomerate, were found associated with the ancient Plutonic rocks, and the coarser varieties consist of materials derived mostly from the talcose and prasoid beds.

"The largest beds of these conglomerates and sandstone were

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* Written in 1846. † Mr. Dana here means to include also the Sacramento.

found in the Shaste Mountains, where no other deposits of any kind were seen excepting the Plutonic and metamorphic described. Following down Destruction River, we travelled for eighteen miles over this formation, and left it again for talcose and prasoid beds, about thirty miles before reaching the Sacramento plains. On the south fork of the Umpqua, the formation was observed with the same characters, and associated with similar talcose and prasoid rocks.

"The *sandstone* is a fine-grained rock, hard and gritty, yet argillaceous in its appearance, and presenting brownish or bluish-black, and grayish-green colours. Though dull, it glistens faintly with minute scales of mica or talc, and with a lens, grains of quartz may be distinguished. In the bluffs, the sandstone is divided into distinct layers of deposition, of varying thickness, from a few inches to several feet. These layers are very irregularly fissured or cracked, and break into wedge-shaped and rhombic fragments. Some of the layers are imperfectly schistose, and others pass into a *slate rock*, which splits easily into thin plates. The latter resembles the talcose argillite already described; but the laminæ are less smooth and shining, and, moreover, the rock contains the same glistening scales as the sandstone.

"The *puddingstone** of the Shaste Mountains is a very hard, compact rock, composed of pebbles of quartz, flint, jasper, and others from the talcose and prasoid rocks. The pebbles are often smoothly polished, and of various fancy colours: black, red, rose-red, green, and gray of various shades, are the more common tints. Coarser conglomerates contain rounded stones, five or six inches in diameter.

"The puddingstone of the Umpqua is very similar to the rock just described. The pebbles averaged half an inch in diameter, and were mostly quartzose, some of them like flint.

"A conglomerate and shale, the latter resembling somewhat the rock of the Shaste Mountains, occur near the Bay of San Francisco, and probably pertain to this formation. I observed them on the shores of the harbour of Sausalito.

"These rocks give very rough features to the landscape, re-

* Similar to the Brazilian and other gold regions.

sembling much the features of the talcose regions. On Destruction River, deep holes, roughened with points, had been eroded by the action of the stream on this rock, and jagged ridgelets and miniature peaks were left standing along the shores. Where the puddingstone prevailed, the country was covered with pebbles, and the soil was nearly as unproductive as the bare sides of the rock itself.

"The slate appears to be the lower member of the series in the Shaste Mountains, and the puddingstone the upper. The latter occurs in thick deposits between layers of the compact and schistose sandstone, and also constitutes steep ridges seven or eight hundred feet high. Numerous veins and seams of quartz intersect the rock, as in the members of the talcose series.

"The dip and strike of these layers are constantly changing, and show that there have been great displacements and contortions. The angle of dip is commonly between thirty and sixty degrees; yet it varies from thirty degrees to verticality often within a distance of twenty yards. The layers are sometimes twisted around and folded over on themselves. The general direction is north and south, though there are frequent oscillations of forty-five degrees either side. Along Destruction River the rock dipped sixty degrees to the southeast. A short distance off the layers inclined sixty-five degrees to the northwest and north-northwest, varying from this to verticality. Still lower down the stream, the layers dipped from thirty-five to seventy degrees to the southeast and east-southeast, the smaller dip occurring along side of a fissure four or ten inches wide, which was filled with fragments of schistose rock; receding from the fissure, the layers were curved, and the dip increased to seventy degrees in the course of thirty feet."

THE END.

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