

valuable localities in search of something better, always hoping that deposits of unheard-of richness would be developed. Occasionally a kind of frenzy would seem to seize on them, and thousands would flock to some new and perhaps distant locality, on the strength of newspaper reports, where many would perish from disease and starvation, the rest returning in poverty and rags. Thus, in 1855, the Kern River fever raged through the State, at least 5000 miners going to that distant region of the Sierra, only to find that the gold deposits were limited in extent, and already worked out. In 1858 the "Fraser River rush" occurred; and this was more disastrous to California than the most deadly pestilence would have been; for it caused a terrible amount of suffering. Nearly 20,000 men left the State for that remote region, where few met with even moderate success, while all suffered great privations, and many died, the survivors coming back in a state of complete destitution. The shallow "placer diggings" of California are now pretty well worked out, and the gold at present is chiefly obtained from the hydraulic mining operations and from the quartz veins. The deep or high gravels, as they are indiscriminately called, and which are worked by the hydraulic process, lie chiefly in Nevada, Placer, and Sierra counties, in the region extending between the branches of the American and Yuba rivers. These gravels are usually associated with heavy deposits of volcanic materials, and, indeed, they are often entirely covered by immense flows of lava, under which the workings are carried by means of tunnels.

All the operations connected with the exploitation of the large hydraulic "claims" are usually on a grand scale. As much as twenty-five, or even fifty, tons of powder are sometimes used in a single blast to loosen the gravel, so that it can be acted on with ease by the jet of water thrown from the "pipes." To give an idea of the force of the agent thus employed, it may be stated that, when a six-inch nozzle is used, under a head of 300 feet, as is sometimes done, not less than 1600 cubic feet of water are discharged in one minute, with a velocity of 140 feet per second. The water, as it thus issues from the nozzle, feels to the touch like metal; and it retains its cylindrical form unbroken until it strikes the gravel bank at a distance of a hundred or more feet. The detritus, thus powerfully acted on, crumbles rapidly, and the disintegrated material is carried by the current into the sluice-boxes, where it leaves its auriferous particles in the "rifles," which are chinks or cavities between the bars or blocks of wood or stone with which the bottom of the sluice are lined. Gold-mining in the solid rock—or quartz-mining, as it is usually called, because the gangue or vein-stone which carries the gold is almost exclusively quartz—is also extensively carried on in California, having been begun as early as 1851. The mines are scattered over the State from San Diego to Plumas counties; but the most important and productive ones are in Amador and Nevada. The distribution of the gold in the veins is exceedingly irregular, and, consequently, the business of quartz-mining has been, in most cases, a very uncertain one. A large number of the principal workings are on, or in the neighbourhood of, what is known in California as the "Great Quartz Vein," or the "Mother Lode," an immense development of quartz, which has been traced from Mariposa County to Amador, over a distance of eighty miles,—not continuously, but in a series of nearly parallel belts, or lenticular masses, with barren intervals between them; these have very nearly the same direction, and are parallel with the axis of the Sierra. It is on the Great Quartz Vein that the celebrated Mariposa mines are situated; which, however, have not, on the whole, proved successful. In the same position are the mines of Amador County, among which the one formerly called the Hayward Mine is

the best known, and for a long time one of the most profitable. The mass of quartz worked in this mine was of great size, although of low tenure in gold. It was, for some years, the deepest mine in the country; but several of those on the Comstock Lode in Nevada have now attained a considerably greater depth.

Silver-mining has been attempted in many localities in California, and much money spent in trying to develop the argentiferous lodes which have from time to time been discovered. A few years ago, there was a great excitement on the very summit of the Sierra in regard to supposed valuable silver-bearing veins, and particularly at a locality called Meadow Lake, in Nevada County. Quite a number of mining camps and towns were built up, one of which had for a time several thousand inhabitants. Nothing permanently valuable was discovered, however, and the region was soon entirely abandoned. The most persistent efforts have been made, for the past ten years, to work argentiferous deposits in the volcanic rocks near the summit of the Sierra, in Alpine County, and near Silver Mountain. Although it does not appear that any mine in this region has been successful, the expenditure is still kept up. Slate Range, a little to the east of Owen's Lake, was the scene of considerable excitement some ten or twelve years ago, rich silver ores having been discovered there; but it was found that mining could not be made profitable in that distant region destitute of water and fuel. Quite recently, the Panamint Range, in the same vicinity, has attracted much attention. The only paying silver mines in the State seem, however, to be those in the Inyo Range, at Cerro Gordo, where the ore is chiefly galena, rich in silver, and also containing considerable gold. The yield of this district in the year 1872 was nearly a million of dollars in value, six-tenths of which was silver.

Quicksilver has been extensively mined in California, the mine of this metal at New Almaden, Santa Clara County, having been worked previous to the gold excitement. All the workable deposits of cinnabar thus far known to exist are situated in the Coast Ranges, and they are chiefly limited to the metamorphic Cretaceous group of rocks, in which they are associated with serpentine, imperfect jasper, hornstone, and chalcedony. By far the most important mines are those at New Almaden, a few miles west of San Jose. These produced, in their palmy days, during the years 1853 to 1857, and 1861 to 1869, from 2,500,000 to 3,500,000 lb of quicksilver per annum. In 1870, the production had fallen off to 1,000,000 lb. The total production of the New Almaden mines between 1850 and 1870 was a little over 40,000,000 lb. The New Idria Mine is in Monterey County, about ninety miles south of New Almaden. This has also been, for some years, a quicksilver-producing locality of considerable importance. Cinnabar also occurs in considerable quantity at numerous places north of the Bay of San Francisco, in Napa and Lake counties. The most important mine in this region is the Redington, near Knoxville, in Lake County. The export of this metal from California was, in former years, very large, reaching, in 1868, the amount of 44,506 flasks, or 3,404,709 lb; in 1870, it was only 6,359 flasks, although the production for that year was estimated at 28,600 flasks, or 2,187,900 lb, of which 12,000 were the product of the New Almaden mine, 7600 of the New Idria, and of the remainder, about one-half was from the Redington, and the rest from various smaller mines north of the Bay of San Francisco.

Copper ores occur in a great many localities within the limits of the state of California, and at some of these a large amount of work has been done, although at the present time there does not seem to be a single locality where the ores of this metal are now mined. Quite large masses of nearly pure native copper, mixed with the red oxide have

been found in the north-western corner of the State, and also farther south in the Coast Ranges. No permanent mine has, however, yet been developed at any point on the west of the Great Valley. In the foot-hills of the Sierra, at a place known as Copperopolis, in Calaveras County, there is a very extensive deposit of copper ore, which was actively mined some ten years ago, producing very largely for a time. The mass of ore here was, in places, as much as 30 feet wide, although not of high grade. In 1864 the value of the shipments of copper ore from California was a little over a million dollars; this was almost all from one mine, the Union, at Copperopolis. Tin has been discovered at one locality in the southern part of the State, in the Temescal Range, about forty miles south-east of Los Angeles; and mining was attempted here, but the locality has been for some time abandoned. Zinc and lead occur, in the form of the sulphuret, in a great number of the quartz veins of the gold-bearing belt; they are generally present, however, only in small quantity, and have not been made the object of mining enterprise. Iron ores are also found, in several localities, in large quantity; the want of suitable cheap fuel has prevented these ores from being utilized, and all the iron consumed on the Pacific coast comes from the Atlantic States or from Great Britain. Coal of the true Carboniferous period does not occur anywhere on the North American continent west of the eastern base of the Cordilleras; but there are, at various points, extensive deposits of lignite and imperfect coal; in some of these, the woody structure is entirely obliterated, and the substance may with propriety be called coal. It is rarely the case, however, that it does not contain a large percentage of water. These deposits are both of Tertiary and Cretaceous age; but at the localities extensively worked in California and on Vancouver Island, the beds belong exclusively to the last-named group. The only mines of coal of any consequence in California are those of Monte Diablo, so called because situated on the north slope of that mountain, and a few miles from the entrance of the San Joaquin River into Suisun Bay. The coal raised at these mines is of tolerably good quality for domestic use; but it cannot be used for ocean steaming or for making gas, as it contains a large amount of sulphur, and from 10 to 12 per cent. of water. These mines have yielded of late about 175,000 tons per annum. There is also a large deposit of about the same quality, and the same geological age, on Eel River, in Mendocino County. This is too far from navigable water to be utilized at present, as it cannot compete with the more accessible deposits on Vancouver Island, and at Bellingham and Coos bays, or with those more recently opened near Seattle in Washington Territory. Petroleum was thought likely, at one time, to become of great importance as a product of California, and several millions of dollars were expended in boring and searching for it, but almost entirely without success. The great bituminous slate formation, of Miocene age, which stretches along the coast from Monterey to Los Angeles, does, indeed, contain a large amount of combustible matter, which may at some future time become of economical value. At present there seems to be no immediate prospect of this; and it is certain that the geological conditions are such that flowing wells, like those of Pennsylvania, will not be found on the Pacific coast. Borax is one of the mineral productions of California, which is becoming of some importance. The value of the exports of this article from San Francisco in 1873 was over \$400,000. Of this, however, a considerable portion came from the adjacent State of Nevada. Sulphur has been mined in several localities, to some extent, for the manufacture of sulphuric acid. Marble occurs in many places in the Sierra Nevada, and is quarried for ordinary architectural purposes. Granite and freestone are abundantly distributed: the former exists in inexhaustible

quantity on the line of the Central Pacific Railroad, the latter near San Francisco and in many other places in the Coast Ranges.

**Fauna.**—Somewhat over a hundred species of mammalia have been found in California. Among the most interesting are the grizzly bear (*Ursus horribilis*), formerly very common, but now only met with in out-of-the-way localities; they are especially abundant in the Coast Ranges south of Monterey—the Santa Lucia Range. They are savage and powerful animals, but do not care to attack men unless suddenly intruded upon, or when with their young. The black bear (*U. americanus*), is still pretty common in the higher parts of the mountains; and the so-called cinnamon and brown bear are supposed to be varieties of this species. The sea lions (*Eumetopias stelleri*) are of little value commercially, but they excite a great deal of interest on account of their size, their strange gambols and extraordinary noises; they abound on the coast, and especially on the Farallones. Visitors to San Francisco from abroad rarely fail to go to the beach opposite Seal Rock, an isolated point near the city, and almost always crowded with these animals, whose curious habits can be watched from the mainland at a short distance. The beaver (*Castor canadensis*) was formerly very common in the State, and many are still left. The spermophiles, or ground squirrels, are extremely abundant, and great nuisances; the ground is often honey-combed for miles with their burrows. The large hare-squirrel and the tiny pine-squirrel are common in the mountains. Gophers are very troublesome to the farmers; there are five species of them, the largest (*Thomomys bulbivorus*) being abundant in the central portion of the State near the coast. The elk (*Cervus canadensis*), formerly found in great numbers in California, is now almost exterminated, unless it be in the northern counties, in the recesses of whose forests they may be still occasionally seen. The deer (*C. leucurus*) is quite common, at a distance from settlements, and especially in the southern High Sierra. A few antelopes are still met with; but when the Americans first entered California, these animals were seen in immense herds all over the plains of the San Joaquin and Sacramento valleys. The mountain sheep (*Ovis montana*) is also nearly exterminated. Of birds, over three hundred and fifty species have been described as occurring in California. Some of the most characteristic of this State are the road-runner (*Geococcyx californianus*), nearly allied to the cuckoo, but like a pheasant in its habits of running and inability to fly; the California woodpecker (*Melanerpes formicivorus*), which has the curious habit of boring holes in the bark of trees and filling them with acorns, which fit most accurately and closely in the cavities thus made. The object of this arrangement appears to be, to allow the grubs to fatten inside the acorns, which thus in time are found to contain a nice meal for the provident bird. The California vulture (*Cathartes californianus*), the largest flying bird in North America, is not limited to this State, but is common there. The sage hen (*Centrocercus urophasianus*) is a fine game bird, found in abundance on the east slope of the Sierra, among the "sage-brush." Two species of quail are very abundant, and very characteristic, in the State,—*Oreortyx pictus* and *Lophortyx californica*. They both have elegant crests of long narrow feathers, in one species turned backwards, in the other forwards. Fish are very abundant on the coast; salmon are caught in great numbers in the Sacramento River, and are an important article of food especially in Oregon. Sturgeon are also abundant; and as their flesh is sold at a very low price, it is much eaten by those who are obliged to be economical. The salmon is also in this respect a very valuable fish. The so-called "rock fish" are among the fish most abundant in the San Fran-



cisco market, and perhaps the most characteristic. They belong to the genus *Sebastes*, and there are several species of different colours. Smelts are abundant; but they are not true smelts, and are inferior to them as an article of food. There are several fish of the flat-fish family, and called soles and turbot; although in no case are the species identical with those found on the Atlantic coast or in Europe. The Tom-cod is abundant in the winter months, and although small, it is one of the best of the fishes of the coast. The barracouta (*Sphyræna argentea*) is decidedly the best-flavoured fish found on the coast; but it is not at all common. The oysters of the Californian coast are small; but foreign ones are planted in the Bay of San Francisco, where they grow rapidly. Hard-shell clams and mussels are abundant, and are eaten in considerable quantity. The haliotis called *Abelone* is taken in great numbers, but eaten exclusively by the Chinese. Crabs, lobsters, and shrimps, are abundant on the coast; and they are used to some extent as food. The variety of species of the crab family is very great, and some of them are very large. Quite serious attempts have been made, under the auspices of the United States Fish Commissioner, to introduce some of the eastern fishes into Californian waters, especially the shad; but these trials have not yet led to any satisfactory results.

**Flora**—The vegetation of California has many features of interest. The great extent of the State and the varied character of its surface are strongly impressed upon its flora. A great number of botanists and professional seed collectors have visited California from time to time; but no general review of all the species has ever been made, although such a one is now in progress under the auspices of the Geological Survey. The entire number of species found in the State is estimated at about 2500. There is not so great a variety of forest-trees as would naturally have been expected; and many of the most useful varieties are entirely wanting. The forests have, in places, and especially along the Sierra, at an elevation of from 2000 to 6000 or 7000 feet, a character of grandeur hardly surpassed in any part of the world. Many of the trees are of gigantic dimensions. Coniferous trees greatly predominate in the densely wooded portion of the State. Of the pines, the sugar pine (*Pinus Lambertiana*) is perhaps the finest tree, reaching occasionally 300 feet in height. Its wood is valuable for inside work, and it is much used in the Sierra, where the tree is chiefly found. This, and the *Pinus Coulteri*, have cones of great size. *Pinus sabiniana*, the digger pine or nut pine, is the characteristic tree of the foot-hills of the Sierra, where it occurs associated with the black oak (*Q. sonomensis*), sparsely scattered over the hill-sides, and never in dense forests. This is the foot-hill arboreal vegetation. Rising a little higher, at an elevation of 3000 to 5000 feet, the pitch pine (*P. ponderosa*), the sugar pine, the white or bastard cedar (*Libocedrus decurrens*), and the Douglas spruce (*Abies Douglasii*) are the predominating and characteristic trees. Still higher, the firs come in, namely the *Picea grandis* and the *amabilis*, as well as the tamarack pine (*P. contorta*). This belt ranges at from 7000 to 9000 feet elevation in the Sierra, through the central portion of the State. The big tree (*Sequoia gigantea*) belongs to the same belt as the sugar pine, Douglas spruce, and pitch pine. This tree occurs in groves or patches from latitude 36° to 38° 15', nowhere descending much below 4000 feet in elevation, or rising above 7000. There are eight or nine of these patches of big trees, and by far the largest is that one which extends along the tributaries of King's and Kaweah rivers, about thirty miles N.N.E. of Visalia. This belt is probably over ten miles in length, the trees are, however, not grouped by themselves, but stand scattered among other species.

The tallest big tree yet discovered measures 352 feet in height. The circumference of the largest, near the ground sometimes reaches nearly 100 feet. Many are over fifty feet in circumference, at 6 feet above the ground. One in the Calaveras Grove, which was cut down, measured 24 feet and 1½ inches in diameter, without the bark, at 6 feet above the ground; this would probably have measured about 27 feet with the bark. Its age was a little less than 1300 years. As the big tree is exclusively limited to California and to the Sierra Nevada, so the only other species of the same genus, the redwood (*S. sempervirens*), is peculiarly a Coast Range tree. It is found chiefly in the counties north of San Francisco Bay, where it forms magnificent forests, exclusively limited to this one species. A few of these trees may be found beyond the line dividing the State from Oregon; but this species, as well as the big tree, is peculiarly Californian. The wood, although brittle and splintery, is durable, and much used for building purposes in San Francisco. In size, this tree is very little inferior to the *Sequoia gigantea*. It appears that this species cannot thrive except where it is frequently visited by the ocean fogs. Another characteristic Coast Range tree is the California laurel (*Tetranthera californica*), which has a beautifully grained wood much valued for cabinet-work. Some species of Coniferous trees occurring in the Coast Ranges are very limited in their range; as, for instance, the well-known ornamental tree, the *Pinus insignis*, which is found near Monterey, and the Cypress (*Cupressus macrocarpa*), of which there is a magnificent grove at Cypress Point, near Carmelo Bay. The *Abies bracteata* is another of these trees of singularly limited distribution. The Douglas fir, or spruce, on the other hand, is spread over a vast area in California, Oregon, Washington Territory, and through the Rocky Mountains. Of shrubs, the manzanita (*Arctostaphylos pungens*) is a very characteristic one, being found all over the Sierra Nevada in dry places; the California buckeye (*Æsculus californica*) is another low-spreading tree or shrub, abundantly distributed through the Sierra and in the coast valleys; and another shrub, called by the Spanish the chamiso (*Adenostema fasciculata*), is widely scattered up and down the Sierra and Coast Ranges. The chamiso and the manzanita, with a variety of shrubby oaks and other thorny plants, when combined together in a dense and sometimes quite impenetrable undergrowth, form what is called by the Spanish a "chaparral." If the chamiso occurs alone, the thicket is known as a "chamisal." The oaks are very characteristic trees of the California Valley, to which they often give by their graceful grouping in isolated clumps a wonderfully park-like character. The burr oak (*Q. lobata*) is the most striking of these trees, growing to a great size, and having peculiar, gracefully-drooping branches. The elm, the hickory, the beech, the chestnut, and many other of the most characteristic and useful trees of the Eastern States, are entirely wanting in California. One valuable variety of the ash occurs, but only in limited numbers, and there is no species of maple which is suitable for use. Indeed, there is no wood on the Pacific coast from which any part of the running-gear of a good waggon can be made; consequently there is a large importation into the State, from the Atlantic side, of timber for this and similar purposes; while, on the other hand, the ornamental forest-trees of California are already widely spread over the world.

**Agriculture**—The amount of land in California, which can properly be called tillable, cannot be stated with any approach to accuracy; and the estimates would vary, according as the peculiarities of the climate, and the possibilities of artificial irrigation, were taken into consideration. A large part of the State consists of barren deserts or precipitous mountains, either too rough, or too

elevated, or too dry for cultivation under any circumstances. A considerable portion of the Great Valley will not yield sufficiently to pay for cultivation, unless a thorough system of irrigation should be adopted. Extensive districts produce valuable crops when the season has been wet enough; and an excess of rain which is injurious in one part of the State is of great benefit in another. The number of acres of "improved land" in the state, as given by the census of 1870, was 6,218,133; but Mr Hittell, in the third edition of his *Resources of California*, published in 1867, estimates the amount of cultivated land at only 1,000,000 acres. The same authority says, "Not more than one acre in ten could now be tilled profitably." Allowing the census returns to be correct, the proportion of improved land would be about one-eighteenth of the whole. Owing to the peculiarities of the climate, and especially its mildness in winter, and the dryness of the summer, the whole system of cultivation is very different in California from what it is in the Mississippi Valley and the Eastern States. If the season is favourable, that is, if rain falls in abundance by November, so that the ground becomes soft enough to plough, then sowing is begun at once, and the best crops are raised when the "latter rains,"—as they are usually called,—which fall in March and April, are tolerably abundant, and yet not so much so as to cause inundations. June and July are the harvest months, and the grain can remain out of doors during the whole summer without injury, or until it can be conveniently carried away, barns being little used. Almost everything, except ploughing, in connection with agricultural work, is done on a large scale, with the help of machinery; and the profitable farms are usually of great size, comprising many thousand acres. According to the census of 1870, the amount of the principal productions of the soil was in that year as follows:—wheat, 16,676,702 bushels; barley, 8,780,490 bushels; wool, 11,391,743 lb; potatoes, 2,049,227 bushels; wine, 1,814,656 gallons; butter, 7,969,744 lb. Barley is the most certain crop raised, and wheat and wool are the most important for exportation. The Californian wheat is of the finest quality, and is largely shipped to foreign countries. In 1873, according to the statistics of the San Francisco *Commercial Herald*, the shipments of wheat and flour were as follows:—to Great Britain, flour, 245,708 barrels, and of wheat, 9,152,303 quintals; to China, flour, 125,891 barrels; to Central America, flour, 42,835 barrels; to Japan, flour, 9566 barrels; to Panama, flour, 12,777 barrels; to Australia, wheat, 22,400 bushels; with other smaller amounts to numerous ports in and about the Pacific. The total shipments for the years 1871–1872 were as follows:—

	Flour, barrels.	Wheat, quintals	Barley, quintals.
1871	232,094	1,311,679	12,371
1872	247,088	6,071,383	176,153
1873	479,417	9,175,960	260,890

Fruit is an item of great importance in the agriculture of California, the quantity raised being very large, and the quality excellent. The pear, plum, apricot, and grape are especially good; and large quantities would be sent to the Eastern States if the distance were not such as to make it difficult and expensive to transport this bulky and perishable commodity. A large amount of capital has been invested in the manufacture of wine. As early as 1861 a million of gallons were made in that year, and in 1870 the product was estimated at 2,500,000 gallons. The principal wine-producing districts are in the vicinity of Sonoma, north of the Bay of San Francisco, and in the region about Los Angeles. The value of the exports of wine has not increased much in the last three or four years; in 1873 it was \$356,373. The quantity of wine which might be produced in California, if there were a market for it, would

be very large; but the quality is not all that could be desired, although the persons engaged in this business are sanguine in the belief that, with time and experience, the difficulties will be overcome, and their products be largely in demand in the Eastern States where at present there is scarcely any sale for them.

California is a country particularly adapted to raising sheep, and the wool interest is a very important one. The winters are so mild that shelter for the flocks is not required, and they have no other food than that which they pick up for themselves on the lower plains in winter, and in the higher mountain valleys in the summer. The summit valleys of the Sierra are literally alive with sheep during the months of July, August, and September, countless herds being driven there from the parched-up plains at the base of the range. In 1873, according to the *Commercial Herald*, about 30,000,000 lb of wool were exported from San Francisco, and 3 000 000 lb consumed in the home manufactories.

**Manufactures**—The value of the manufactures of California is given, in the census report of 1870, at \$66,594 536 the increase having been rapid within the past ten years; previous to 1860 almost every manufactured article used in the State was imported from the East or from Europe. The great distance of the Pacific coast from the manufacturing districts of the world offers a heavy premium for the establishment of various industries, especially for those which furnish bulky and inexpensive products, such as wooden wares, agricultural implements, machinery, coarse articles of clothing, and vehicles. The drawbacks are, the high price of labour, where the Chinese cannot be employed; the absence of good coal, and the scarcity of other fuel; the distance of the water-power from the principal markets, and its high cost at all points, which is due to the necessity of building long canals, dams, and other appliances for storing and utilizing the water; and the absence of those woods which are most needed for the innumerable uses to which this material is put in manufacturing. There are certain articles, however, which have to be made in California, because the people of other countries find it difficult to ascertain exactly what is needed to meet the requirements of the Pacific coast. Thus, mining machinery is a very important article of Californian manufacture, and many improvements have been made in this department, called out by the peculiar wants of this State and of Nevada. The manufacture of heavy woollen goods, especially blankets, is an item of importance, there being three large establishments of this kind in San Francisco. Leather is tanned in considerable quantity in the coast counties, and the exports of this article amounted in value, in 1872, to the sum of \$258,692. Boots and shoes are manufactured in large quantity for home consumption and from native leather.

**Population**—The population of California is concentrated in and around San Francisco; and it becomes rapidly less dense as one recedes from the centre. The extreme northern and southern counties are very thinly inhabited. The central part of the State, embraced between the parallels of 36° 20' and 40° including only one-third of its whole area, contained in 1865 over ninety-five per cent. of the population. A region of 4000 square miles adjacent to the Bay of San Francisco includes probably half of the entire number of inhabitants in the State,—San Francisco alone, by the last census, having 38 per cent. of the whole. The reasons of this concentration around the bay are not difficult to find; the climate is more agreeable and healthier, and the valleys which open out to its waters are the most delightful and most fertile portions of the state. The desire of concentration is strongly felt in a region where the country is so thinly settled, and where the facilities



of communication are not great, and schools and churches far apart, or wanting altogether. Those who have made fortunes in mining come to "the Bay" to spend them; those who have lost their all, or become "strapped,"—to use the miner's phrase,—go to the great city to find employment. And San Francisco is not only the metropolis of California, but of the whole Pacific coast. There is not another city or town having one-tenth of its population anywhere from Alaska to Panama. It has the only really good harbour along the entire line of coast from Lower California north to Puget Sound, that of San Diego excepted, and this has a desert region behind it, where settlements cannot be made. The population of San Francisco, by the census of 1870, was 149,473, having increased to that number in the previous decade from 56,802, the gain of the city being relatively considerably greater than that of the State itself. Sacramento city, the capital, is the only other town in California which has as much as one-tenth of this number. It is claimed, indeed, that the present (1876) population of San Francisco is not less than 250,000, the increase having been unusually large during the past year, which has been, on the whole, a very prosperous one for the State. The other large towns are—Sacramento, 16,283; Oakland, 10,500; San Jose, 9089; Grass Valley, 7063; and Los Angeles, 5728,—all these figures being those of the census of 1870. The population of the whole State, according to the same authority, was, in 1870, 582,031, an increase of 53 per cent. since the previous census of 1860. The growth of California has not been in the years from 1860 to 1870 as rapid as in the decade preceding that, when the increase amounted to 310 per cent. Remarkable as has been the development of this State, it does not equal that of some of those of the Mississippi Valley during the same period. Thus Iowa gained more between the years 1860 and 1870 than did California, although having only one-third of the area of that State; and in the decade previous to that her gain was relatively nearly equal to that of the Golden State, and actually twice as great. The actual increase of population in Massachusetts, with its area of only 7800 square miles, was greater in the years 1860-1870 than was that of California.

The brilliant discoveries of metalliferous deposits in Nevada, wholly developed within the past fifteen years, have added much to the wealth and resources of California, for the ties of business are nearly as strong between the two States as if there were no political line of division between them. Nearly all the capital invested in the region at the eastern base of the Sierra came from the Pacific side of the mountains, and most of the machinery used there has been constructed in San Francisco. Nevada takes a large amount of the surplus agricultural products of California, and gives bullion in exchange, that being the only thing she produces for exportation.

The Chinese element in California is a peculiar and

**CALIGULA, CAIUS CÆSAR**, the third of the Roman emperors, was the son of Germanicus and Agrippina, and was born in 12 A.D. He was brought up in his father's camp among the soldiers, and received the name Caligula, from the *caligæ*, or foot-soldiers' shoes, which he used to wear. In 32 he was summoned to Tiberius, who was then living at Caprea, and did all in his power to ingratiate himself with the tyrant. Perhaps about 35 he married his first wife, Junia Claudia, who died in the following year. Caligula seems then to have resolved upon obtaining the succession to the empire. For this purpose he leagued himself with Macro, commander of the prætorian guards,

interesting feature. By the last census there were 49,310 of that race in the State. They are settled in great numbers in San Francisco, where they are house-servants, and operatives in the manufacturing establishments, which could not be successfully carried on with white labour. They also work the abandoned placers, although the amount of their gains in this operation must usually be very small, as they are only allowed to occupy spots supposed by the white men to have been quite worked out. "The white miners have a great dislike to Chinamen, who are frequently driven away from their claims, and expelled from districts by mobs. In such cases the officers of the law do not ordinarily interfere; and, no matter how much the unfortunate yellow men may be beaten or despoiled, the law does not attempt to restore them to their rights or avenge their wrongs" (Hittell, in *Resources of California*, 3d ed. p. 375).

**General Considerations.**—Finally, California has in its favour its immense extent of area, its variety of physical configuration, the fertility of a portion of its soil, and, above all, the mildness and attractiveness of its climate. Its position on the Pacific is one which justifies the confident expectation that the commercial interests of San Francisco will continue to increase in magnitude, since it must always concentrate the trade of an immense area. There are some conditions which may eventually operate powerfully to retard the development of this State. Of these the most important is, perhaps, the wastefulness of the present method of agriculture, by which crops are continually taken from the soil, and nothing restored to it. Another serious matter is the constant wholesale destruction of the forests going on in the Coast Ranges and in the Sierra; there is reason to fear that this will eventually have a disastrous effect on the regimen of the rivers, causing inundations in the spring and excessive droughts in summer. The danger from earthquakes has already been alluded to; and there is no question that it has had and will continue to have an influence in retarding the growth of the State, as there is not the least doubt that it similarly affects the whole South American Pacific coast. The facility with which the legislature can be manipulated, and brought to sanction schemes fraught with injury to the people, is not a circumstance peculiar to California; although, in several instances, heavy blows have in this way been struck at the prosperity of San Francisco. The distrust of the legislature often leads the people to reject that which is good, from the fear that an undertaking which looks well at the start may be so managed as to result in ruin. Thus, it seems impossible to carry out any general system of irrigation, or of forest culture and preservation, desirable as these things may be, because the people have no confidence in anything which has to be managed by the legislature, or which can be interfered with by that body at any time, and diverted to the subservience of private ends, to the injury of the public. (J. D. W.)

whose wife he had seduced, and there can be no doubt that the death of Tiberius was hastened by one or both of them. The senate conferred the imperial power upon Caligula alone, although Tiberius, the grandson of the preceding emperor, had been designated as co-heir, and he entered on his first consulship in July 37. For an account of his reign and character see **ROMAN HISTORY**.

**CALIPH, or KHALIF**, the sovereign dignity among the Mahometans, vested with an almost absolute authority in all matters relating to religion and civil polity. In the Arabic it signifies *successor* or *vicar*, the caliph bearing the same relation to Mahomet that the pope, in

the estimation of Roman Catholics, bear to St Peter. It is at this day one of the titles of the grand seignior or sultan, who claims to be successor to Mahomet, through the line including Abu-Bekr, Oman, and Othman (the Sunnite view), and also of the Sophi or Sufi of Persia as claimant through Ali (the Shiite view). The history of the rule of the Sophis may occasionally remind the student of the saying current respecting Russian autocracy some fifty years ago, that it was "despotism tempered by assassination." When Louis XIV. was one day, in the presence of some courtiers, extolling the government of the Sophis as something approaching to an almost ideal excellence, the Marshal d'Estrees replied, "But, sire, I have seen three of them strangled during my lifetime." One of the chief functions of the caliph, in his quality of imam or chief priest of Islamism, was to begin the public prayers every Friday in the chief mosque, and to deliver the *khoobta* or sermon. In after times they had assistants for this latter office; but the former was always performed by the caliph in person. The caliph was also obliged to lead the pilgrims to Mecca in person, and to march at the head of the armies of his empire. He granted investiture to princes and sent swords, standards, gowns, and the like, as presents to princes of the Mahometan religion, who, though they had thrown off the yoke of the caliphate, held of it as vassals. The caliph usually went to the mosque mounted on mules; and the Seljukian sultans, though masters of Baghdad, held their stirrups and led their mules by the bridle some distance on foot, till the caliph gave them the sign to mount on horseback. At a window of the caliph's palace there always hung a piece of black velvet 20 cubits long, which reached to the ground, and was called the *caliph's sleeve*; this the grandees of his court kissed daily with great respect. After the destruction of the caliphate by Hulagu, the Mahometan princes appointed a particular officer in their respective dominions to sustain the sacred authority of caliph. In Turkey this officer is called *mufiti*, and in Persia *sadne*.

The successions of caliph continued from the death of Mahomet till the 655th year of the Hegira, when Baghdad was taken by the Tatars. After this, however, there were persons who claimed the caliphate, as pretending to be of the family of the Abbassides, and to them the sultans of Egypt rendered great honours at Cairo, as the true successors of Mahomet; but this honour was merely titular, and the right allowed them only in matters of religion; and though they bore the sovereign title of *caliph*, they were subjects and dependents of the sultans. In the year of the Hegira 361, a kind of caliphate was erected by the Fatimites in Africa, and lasted till it was suppressed by Saladin. Historians also speak of a third caliphate in Yemen or Arabia Felix, erected by some princes of the family of the Jobites. The emperors of Marocco assume the title of *grand scherifs*, and pretend to be the true caliph, or successors of Mahomet, though under another name. For particulars concerning the caliph and caliphate see works bearing on Mahometan rule, such as Ockley's *History of the Saracens*; Gibbon's *Decline and Fall*, chap. li.; Von Hammer, *Histoire des Ottomans*; and for a brief survey, Freeman's *History and Conquests of the Saracens*, Oxford, 1856. See also articles **ABBASSIDES** and **MAHOMETANISM**.

**CALISTHENICS.** See **GYMNASTICS**.

**CALITRI**, a town of Italy, in the province of Principato Ulteriore and district of Sant' Angelo de' Lombardi, about 40 miles S.E. of Benevento. It is situated on an eminence near the River Ofanto, and is supposed to occupy the site of an ancient town called *Aletrium*. Its principal buildings are the parish church and a Benedictine convent. Population, 6629.

**CALIXTUS**, the name of three different popes or bishops of Rome. Little is known of **CALIXTUS I.**, bishop of Rome from about 220-226 A.D., during the reigns of Heliogabalus and Severus. **CALIXTUS II.**, Guido of Vienne, was elected in 1119, after the death of Gelasius II. In 1122 he concluded with the Emperor Henry the important treaty of Mentz, by which the mutual rights of the church and the empire were definitely settled. He died in December 1124. **CALIXTUS III.**, Alphonse de Borgia, was raised to the Papal chair in 1455 at a very advanced age. He was feeble and incompetent. The great object of his policy was the excitement of a crusade against the Turks, but he did not find the Christian princes responsive to his call. He died in 1458.

**CALIXTUS, GEORGIUS** (1586-1656), a celebrated Lutheran divine, born at Middleburg in Holstein in 1586. After studying at Helmstadt, Jena, Giessen, Tübingen, and Heidelberg, he had an opportunity of travelling through France and England, where he became acquainted with the leading Reformers, and saw the different forms which the Reformed church had assumed. On his return he was appointed professor of divinity at Helmstadt by the duke of Brunswick, who had admired his abilities in a contest which he had when a young man with the Jesuit Augustine Turrianus. After becoming a master of arts he published a book, *Disputationes de Præcipuis Religionis Christianæ Capitibus*, which provoked the hostile criticism of several learned men; and on his elevation to the professorship he published his *Epitome of Theology*, and soon after his *Epitome of Moral Theology*, which gave so great offence as to induce Statius Buscher to charge him with a secret leaning to Romanism. Scarcely had he refuted the accusation of Buscher, when, on account of his intimacy with the Reformed divines at the conference of Thorn, and his desire to unite them with the Lutherans, a new charge was preferred against him, principally at the instance of Calovius, of a secret attachment to Calvinism. The disputes to which this gave rise, known in the church as the Syncretistic controversy, lasted during the whole lifetime of Calixtus, and distracted the Lutheran Church, till a new controversy arose with Spener and the Pietists of Halle. Calixtus died in 1656. There is a monograph on Calixtus by Henke, 2 vols. 1853-56; see also Dorner, *Gesch. d. Protest. Theol.*, pp. 606-624.

**CALLAO**, the chief port of Peru, lies 8½ miles from Lima, the capital city, in 12° 4' S. lat., 77° 13' W. long. It is built on a flat point of land in the recess of a spacious and well-sheltered bay, which is partly enclosed by the islands of San Lorenzo and Fronton, and affords the best anchorage on the Peruvian coast. The modern town lies half a mile north of the site of an older city, destroyed by an earthquake and invasion of the sea in 1746. It consists mainly of houses built of wicker-work and plastered with mud, stronger buildings being dangerous from the frequency of earthquakes; but a walled quadrangular fortress, built by the Spanish Government between 1770 and 1775, extends over about 15 acres, and is now used for the custom-house offices and stores. There are also several forts mounting cannon, and among the public buildings are the military and naval Government offices and barracks, three Catholic churches and a Protestant chapel, two clubs, a hospital, and four banks. Several newspapers are published in the town. Callao is the headquarters of the Pacific Steam Navigation Company in South America (incorporated in 1840), and the works in connection with their large fleet of steam-vessels—foundries, carpenters' shops, flour-mills, bakeries, and gas-works—occupy a large area near the custom-house. A large steam sugar-refinery is also in operation. Harbour works, consisting of sea walls of concrete blocks, and docks, with