most conspicuous within the limits of the United States,—but also for its minerals, its climate, its peculiar geological features, its remarkable forests, its scenery, and the comparative density of the population along its western flank. Its importance and interest are still farther enhanced if (as on the whole seems a reasonable thing to do) we consider the Cascade range as being a continuation. The Sierra Nevada proper forms the western edge of the widest and highest portion of the Cordilleras, or that portion which lies east of the State of California. It is especially conspicuous from the western side, because on this side it falls nearly to the level of the sea, while on the other side it sinks only to the general plateau level. It does not, however, border the Pacific directly, since there is, all along its course, a lower system of mountains, rising directly from the coast—the so-called Coast ranges. With these the Sierra Nevada and the Cascade range are so inosculated in certain portions of their extent that a topographical separation of them is impossible, but for a considerable distance both the Sierra and the Cascade range are distinctly separated from the Coast ranges by broad low valleys, the most extensive of these being the Great Valley of California (for which, as well as for the more important features of the Californian Sierra, the reader is referred to *Ency. Brit.*, vol. iv. pp. 696-8). The Sierra Nevada has been already shown to be made up of a core of eruptive granite flanked by rocks of Mesozoic age ; the development of these Mesozoic rocks increases towards the north, and in the region lying along the western declivity of the chain, in the central portions of the State, forms the auriferous belt of the Sierra. The gold-producing detrital deposits, formerly so extensively worked, are gravels of Tertiary age covered more or less completely by volcanic materials, which not unfrequently attain a thickness of several hundred feet. As in other portions of the Cordilleran region, the presence of eruptive rocks of Tertiary and post-Tertiary age is a fact of great importance. The volcanic materials in question are seen in places in large masses on almost the very highest portion of the Sierra, in its southern extension, in a region where there is very little of this material lower down on the flanks of the range, and where there are no slates and no mining or washing for gold of any importance. Just south of the Mount Whitney group, where the Sierra rapidly falls off in height between the two ranges of which the system is here comprised, there is a region—the valley of the Kern river—in which occur several volcanic cones, which have a very recent look, but which are not known to have been in eruption since the advent of the whites. This region, however, for several years in succession— from 1870 onwards, and perhaps from an earlier date—appears, on good evidence, to have been repeatedly and violently disturbed by earthquakes ; and this seems also to have been the portion of the Sierra which was most affected by the great earthquake of March 26, 1872. Midway in Owen’s Valley, on the east side of the Sierra, beginning about 30 miles north of Lone Pine, where this earth­quake was most disastrous in its effects, there is a region of volcanic cones and lava-flows, by which the river is crowded over against the Inyo range, at the foot of which it has only just room to flow. These cones are seemingly as perfect as they ever were ; and the flows of basalt have spread themselves out over the sage-brush slope in a manner indicative of a very recent date for their out­breaking. Yet all seem now to be entirely dormant. Even solfataric action is almost (if not quite) exclusively manifested at the present time at or near the summits of the highest volcanic cones of the Sierra and the Cascade range. Farther north more and more volcanic materials cover the western flank of the range ; and from about 39o 30' N. lat. much the larger portion of the older rocks is overlain and concealed by modern eruptive materials, through which the streams have worn channels, often of great depth, from the sides of which access is given to the auriferous gravels occupying the bottoms of the channels of the old Tertiary but now buried river-systems. In Lassen’s Peak, in 40° 30' N. lat., we have the first exhibition of the isolated volcanic cone rising high above the adjacent country, which makes so prominent a feature of the range farther north in California and through Oregon and Washington Territory. This volcanic mass is 10,537 feet in height, and there are abundant signs of recent volcanic activity on and near it. There are, in this vicinity, several localities where hot springs occur, and where the rock has been so softened by solfataric action as to have given rise to mud lakes, in which jets of hot water and mud are sometimes thrown to a height of several feet. One of these places, about 8 miles from the summit of the peak, is 5976 feet above the sea, and there is here a pool of hot water 600 feet long by 300 broad, in the midst of which miniature mud volcanoes are being constantly formed. There are no such striking indica­tions of dormant volcanic activity as are seen in the vicinity of Lassen’s Peak anywhere to the southward along the crest and flanks of the Sierra. Neither is it known that there has been anything which could be properly called an eruption, whether of lava or ashes, since the region was first visited by the whites, either from Lassen’s Peak or from the much grander volcano to which the name of Shasta is given. At Lassen’s Peak a great change takes place in the character of the range, which is here broken through transversely by a great fault, to the south of which we have the high ranges and deep canons often cut down through the volcanic strata, and sunk deeply into the underlying metamorphic rocks, while to the north is a great depression, comparatively level, and exclusively occupied by volcanic rocks, which stretch off to the north and north-east, in almost unbroken continuance, for many hundred miles, forming a portion of the northern plateau region already described. Seventy miles north-west of Lassen’s Peak rises Mount Shasta (14,440 feet), standing in remarkable isolation on a base between 10,000 and 11,000 feet lower than its summit. There are indications of former volcanic activity near the summit, but they are not so marked as those on and near Lassen’s Peak. There is a flat area about 400 feet below the summit, on one side of which are several orifices from which steam and sulphurous gases were constantly escaping at the time of the present writer’s ascent of the mountain (1862).

North of Mount Shasta the mountain mass now called the Cascade range maintains characters similar to those which it has between Lassen’s Peak and Shasta for a distance of fully 500 miles, or until we have passed the northern boundary of the United States. The principal continuous ridge is comparatively low, and on it at irregular intervals rise great volcanic cones, differing con­siderably from each other in elevation, but all much higher than the surrounding plateau-like base on which they are built up. Unfortunately no portion of the Cascade range has as yet been topographically surveyed. From Mount Shasta northwards there are several prominent peaks, which are apparently volcanic, but which have not the conical form, while others exhibit this peculiar feature in a high degree of perfection. Mount Pitt (9718 feet) is a well-defined cone, about 75 miles north of Shasta. Mount Jefferson, about 150 miles still farther north, is of a similar character; and between Pitt and Jefferson are various prominent peaks, especially the highly picturesque group of five sharp points, known as the Three Sisters, only three of them being visible from the Willamette Valley. All through this portion of the range evidences of comparatively recent volcanic action are present, in the form of regular craters and outflows of lava.- Somewhat less than 100 miles north of Mount Jefferson is the grand break made in the Cascade range by the Columbia river, which has cut entirely through the volcanic mass, down almost to the level of the sea,— the Dalles, on the eastern side of the range, having an elevation of only about 100 feet At the Dalles—so named on account of the great, broad, flat plates or sheets of lava which are there well exhibited on and near the river—is the beginning, in this direction, of the volcanic plateau of the Columbia. Near this point rise three of the best-defined volcanic cones of the range, two—Mount Adams and Mount St Helens—on the north side of the river, and one— Mount Hood—on the south. The last-named has been found by barometric measurement to be 11,225 feet; the other two seem to be of nearly equal height (about 10,500 feet). Mount Rainier (14,444 feet)—about 75 miles north of the Columbia river—is rivalled in the whole of the Cascade range by Shasta only. The views of Rainier from Puget Sound are magnificent. It is much less accessible than Shasta, as it lies in the midst of a dense forest, far from roads ; it is also very much more deeply covered with snow and ice. Still farther north than Rainier, and near the boundary line of the United States, is Mount Baker (10,755 feet), a prominent object in the grand panoramic view from Victoria, Vancouver Island. While evidences of comparatively recent vol­canic action are so conspicuous all along the range from Lassen’s Peak north to Mount Baker, it is not easy to reconcile the con­flicting evidence with regard to the present condition of the eruptive agencies. The present writer, during several years of exploration, found no evidence whatever of any recent outflow of melted lava, such as would harden into a solid rock on cooling, in any part of the Sierra Nevada or the Cascade range. The eruptive rocks of these ranges are mainly andesites; but the last outflow of molten rock appears to have been basaltic in character. This is certainly true for the Sierra Nevada, and prob­ably so for the Cascade range. Under the basalt we find, in the buried sedimentary strata, abundant remains of vegetation, pro­nounced by competent authority to be Pliocene in age, with a few species intermingled which have a decidedly Miocene character. The animal remains found under the basaltic lava are all of extinct species, with the single exception of man, whose bones or handi­work have been repeatedly taken from strata occupying this geological position. The age of the sedimentary beds under the basalt is therefore Tertiary, from the combined evidence of both plants and animals. There is no evidence that fragmental lava— ashes, cinders, and the like—has been emitted from any one of the volcanic cones of the Sierra Nevada since the region became known to the whites; but there is abundant evidence to this effect in regard to some of the high points in the Cascade range. Mount Baker seems to have furnished the most unquestionable proof of activity in recent times. The first known eruption of this volcano appears to have taken place in 1843. In at least three later instances Mount Baker has been seen in eruption by men of un-