Mauvaises Terres was applied by the fur-hunters. These Bad Lands, which lie south and south-west of the Missouri and along its tributaries coming in from that direction, may be considered as the precursors and representatives of lands which, from the agricultural and business point of view, are bad enough, but which to the geologist and lover of the picturesque are in the highest degree good, and which are perhaps, on the whole, more striking than anything which the continent elsewhere exhibits. The essential features of their unique and striking type of scenery (of which the Grand Canon of the Colorado is the grandest and most complete example) are these :—a heavy mass of stratified materials, several thousand feet in thickness, and covering many thousand square miles, has been cut into and eroded away, so as to give rise to a labyrinthine series of gorges, or “canons,” having a depth of from 1000 to 5000 feet, the walls of which are almost always extremely precipitous and in places perpendicular, and are by no means flat surfaces, but are worn and sculptured into forms almost always peculiar and striking, and often fantastic in the highest degree. And to a variety and complexity of form which seem to find a parallel nowhere on the earth is added the attraction of colour, the various groups of strata forming the canon walls presenting a gay adornment of tints of red, yellow, purple, brown, and grey, the depth and brilliancy of which surpass belief.

The region in which these wonderfully picturesque forms of landscape occur lies to the south and east of the Great Basin, between Great Salt Lake and the Colorado, to the west of the Green river branch of that river, extending west, with a gradual dis­appearance of its characteristic features, to near the border line of California. The Uintah Mountains may with convenience, although somewhat arbitrarily, be taken as the northern limit. But, in point of fact, the characteristic type of scenery begins to be developed in Colorado, where the Book or Roan plateau, which rises to a height of 9000 feet, is deeply cut into by the White river in the north and the Grand river in the south.

The south-westernmost portion of the region, or that portion which includes the Grand Cañon and its branches, has a length from north-east to south-west of about 180 miles and a breadth in the opposite direction of about 125 miles. On the west it has as its boundary a grand escarpment which marks the change from “the calm repose of the strata with horizontal surfaces to the turmoil of flexed beds and jagged mountain crests ” exhibited in the Sierra and the adjacent ranges on the south-east, in the deserts of southern California. The transition from one type of geological structure to the other on that side is said to be so abrupt that one “ might almost hurl a stone from one region to the other.” On the north the Grand Canon receives the drainage of four distinct plateaus, the Sheavwits, Uinkaret, Kanab, and Kaibab, east of which lies a fifth (the Paria), which drains into Marble Canon,—the prelude to the Grand Cañon. The Paria plateau differs from the others in that it lies at a lower level and is covered mainly by Triassic rocks, while the others present an almost unbroken expanse of Carboniferous strata. The southern boundary of the Grand Cañon district is a continuation of the western. The same great escarpment which overlooks the Sierra to the west stretches southward across the Colorado, preserving the same features for 30 or 40 miles. Slowly changing its course, it follows a south-easterly course through eastern Arizona, where its edge is known as the Mogollon Mountains. Passing this line to the south-west, the country descends at once from the horizontal platform into a lower country having apparently similar geological features to those presented in the Sierra country to the west. The following are some of the more interesting facts connected with the form and structure of the plateaus making up the Grand Canon district on the north of the Colorado. The Sheavwits has on its western side the so-called “ Great Wash,” a broad and deep valley to the north of the Colorado. The great escarpment of this plateau is a fault or break, along the course of which the country to the east has been raised several thousand feet. The Uinkaret plateau, which adjoins the Sheavwits on the east, is separated from it geo­logically by another great fault, the Hurricane Ledge, which marks a rise of the region to the east to the amount of 1600 or 1800 feet, and which is prolonged far to the north. On this plateau are numerous cones and flows of basaltic lava, some of which appear to be of very recent origin. Under some of these are beds of Permian age, lying over the Carboniferous, and preserved from erosion by the harder eruptive material with which they are capped. Another short fault separates the Uinkaret from the Kanab plateau on the east. The Kanab is the broadest of the four plateaus, and has a grand side cañon cutting deeply into it, and running to the Color­ado. The Kaibab plateau comes next on the east. Flat on the summit, and terminated by lofty battlements upon its eastern and western sides, this is much higher than the other plateaus to the west, being from 7500 to 9300 feet above the sea-level. Its surface is covered in part with forests, grassy parks intervening which in summer are gay with flowers of rare beauty and luxuriance. The total length of this plateau is about 90 miles, and its maximum width about 35. It is a block of ground raised by displacement between two great faults. Farther east and at a much lower alti­tude is the Paria plateau, “a terrace of Triassic strata scored with a labyrinth of cafions;” and farther north-east, again, is the Kaiparowits, which is nearly equal to the Kaibab both in size and altitude ; this is composed of strata of Lower and Middle Cretaceous age. Still farther north is a succession of plateaus, separated from each other by lines of dislocation, which, however, gradually close and become less conspicuous in this direction, the topographical features of the region being dependent chiefly for their existence on simple erosion, with the frequent occurrence of curious volcanic formations, and not so much on bodily uplift and depression of great masses of strata by faulting. On the southern side of the Colorado is another vast expanse of plateau land, underlain by nearly horizontal strata, which, with one unimportant exception, are not deeply scored with cañons as is the region to the north. “ Low mesas, gently rolling, and usually clad with an ample growth of pine, pifion, and cedar, broad and shallow valleys, yellow with sand or grey with sage, repeat themselves over the entire area. The altitude is greater than that of the plateaus north of the Colorado, except the Kaibab, being on an average not far from 7000 to 7500 feet. From such commanding points as give an overlook of this region one lonely butte is always visible, and even conspicuous, by reason of its isolation. It stands about 20 miles south of the Kaibab division of the Grand Cañon, and is named the Red Butte. It consists of Permian strata lying like a cameo upon the general platform of Carboniferous beds. The nearest remnant of similar beds is many miles away. The butte owes its preservation to a mantle of basalt which came to the surface near the centre of its summit. . . . Fifty or sixty miles south of the river rise the San Francisco Mountains. They are all volcanoes, and four of them are of large dimensions ; the largest— San Francisco Mountain, nearly 13,000 feet high—might be classed among the largest volcanic piles of the west. Around these four masses are scattered many cones, and the lavas which emanate from them have sheeted over a large area.” The length of the Grand Canon of the Colorado, following the meanderings of the river along the middle of its water-surface, is about 220 miles. Where the cañon is narrowest it is five miles across from the edge of one wall to the edge of the other. The general depth is 2000 feet ; but in the centre is a portion 3000 feet deeper, having a width about equal to its depth. The Kaibab division, or that part which has the plateau of that name on the north, is the most stupendous portion of the Cañon, a thousand feet deeper than any other, and far more diversified and complex in its structure.

The peculiar interest of the topography of this region is due in part to the manner in which great blocks of strata have been raised or depressed between long faults, which have given rise to differences of level amounting to thousands of feet, and in part to the extraordinary amount of erosion which the region has undergone, first over its whole surface where not protected by overlying masses of harder volcanic material, and, later, in the channels of the streams, which channels have been gradually grow­ing narrower with the lapse of time, the streams diminishing in volume, until during the present epoch they have either shrunk to nothing or have become absolutely insignificant in comparison with what they were in later Tertiary times. In fact, we have in this region the best possible illustration of the progress and effect of that stupendous desiccation of the climate which has long been manifesting itself all over the world, and of which the results may easily be traced far back in geological history. The contrast between the plateau region south and south-east of the Great Basin and that lying to the north—between the region of the Colorado and that of the Columbia—is a most striking one. In the north the volcanic outflows have filled the depressions in the corrugated and folded strata, covering over the whole of the lower portions of the region, from which the older mountain ranges project like islands from the great congealed sea of lava. The rivers could not subsequently cut very deep into these overflows, because the material is so hard and the general level of the region so low. In the Colorado region, on the other hand, the strata have not been crumpled, folded, and metamorphosed, but raised *en masse* to a high elevation, and not hardened so as effectually to resist erosion ; and, possessing just enough variety of lithological character to prevent uniformity of wearing away and give complexity to the resulting forms, they have, under the simple influence of eroding agencies, assumed the wonderful condition in which we now behold them. Here, too, volcanic agencies have been active ; but the molten material has been poured out from orifices at a great elevation, and has built up cones, some of which are of nearly as grand dimensions as the mightiest of the Sierra Nevada and Cascade range ; but the valleys and lower regions have not been filled up by them, nor have there been in the southern plateau region any such enormous overflows as those which characterize the northern volcanic district.

V. The Sierra Nevada may without hesitation be called the most important and interesting member of the Cordilleran system, not only as a long and elevated mountain chain,—on the whole the