

GEOLOGY ALONG THE TRAIL

Dark colored rocks and small stones along the trail are not local. They have been “imported” from San Marcos and Escondido, where the Southern California Batholith outcrops, and are commonly used in making roadbeds. This rock is an intrusive igneous rock (cooled underground), having visible interlocking crystals, and is commonly called granite. It is actually a granodiorite, closely related to granite, but lacking one of the key minerals of granite. It is also quarried in a disintegrated state (naturally weathered into very small pebbles), and is commonly called D.G. It underlies the trail.

Looking South across the lagoon at Signpost 6, the almost-flat hilltop is one of the many wave-cut terraces seen in San Diego County. It was a beach 200,000 years ago, and was elevated by movement of the land. It sloped gradually down to the sea level of the time, just as today’s beach does. The terrace cuts across a red-brown formation, deposited in shallow water. Iron minerals rusting during deposition of the silts and muds cause the color. This deposit sits on a much older rock, the Scripps sandstone; the contact between them is called an unconformity, and represents a long period of erosion. About 45 million years of rock is missing here.

On the South side of the lagoon, near the freeway, is a cut in the hill to accommodate La Costa Ave. A small fault, which is not active, is visible in it. It does not cut through the formation at the top of the hill. It is difficult to pick out, especially when the vegetation gets some water. Look for the offset beige sandstone layer, higher on the right than the left. (6)

The rock wall we see along the trail at Signpost 6 is made of the 45 million year old Scripps sandstone of the La Jolla Group of formations. It was deposited as a sand bar or barrier island offshore. Note that the shoreline would have had to be significantly farther inland than this spot, and sea level way above our heads here. The orange coloration in several places is due to the oxidation of iron minerals in the sand (rust). The color doesn’t go all the way into the rock, as it is a recent addition. This layer was formed in water deep enough to have little free oxygen, so little rusting of the iron took place during deposition of the sand.

Erosion along the trail is evident in many places: along unauthorized “trails” up the hill, at the outcrop of the Scripps formation, and at the Kumeyaay trail near Signpost 7. Here there is a very small, alluvial fan developing as the eroded material is deposited at the base of the hill.

Farther East along the trail, at Signpost 13, note the tilted fine layers, called cross-beds, showing deposition of the sediment in changing currents. Above them, we see unconsolidated soil and silt, which sometimes contain cobbles of mixed sizes. The water bringing the fine material flowed fairly slowly over the area, but increased in velocity periodically, and was able to carry larger rock particles. These may represent a time of flooding.

At Signpost 24, below the East Lot, we find the Bay Point Formation, deposited along the sides and bottom of an earlier lagoon about 120,000 years ago, during the last ice age. This formation contains fossils of scallops and “pen” shells. *NO COLLECTING PLEASE!*