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SEQUOIA NATURE GUIDE SERVICE

The Nature Guide Service of the Sequoia National Park, in its lectures on the natural features of the Park, covers the subject of that great attraction, Moro Rock, in an intensely interesting style. The information given is so readable, and gives the layman such a non-technical story of the geology of the great mountain country of the Sequoia National Park, that it is considered well worth the time of our readers.

MORO ROCK

Moro Rock, elevation 6,719 feet above sea level, is one of the great granite outcrops of the Sierra Nevada Range. From its table top, reached by several hundred feet of stairway, one of the most magnificent panoramas of mountain canyon, forest and valley in America may be obtained. Three peaks over 13,000 feet; seven higher than 12,000 feet; and six over 11,000 feet are visible. Thousands of acres of forests of sequoias, pines, and firs are spread before one. The canyon of the Middle Fork of the Kaweah River is 4,100 feet below. The San Joaquin Valley spreads away to the horizon in the west. On a clear day the outline of the Coast Range, 60 miles away, may be seen above the valley haze.

GEOLOGY OF THE SIERRAS

Millions of years ago, long before the Sierra Nevada Mountains were formed, a high range of mountains extended approximately northeast and southwest through this region. During many centuries of weathering, these mountains were reduced to low, rounded hills. After long quiescence, a series of violent upheavals, earthquakes, and volcanic activity occurred. An immense block of the earth's crust, approximately 400 miles long by 50 miles wide was tilted upward toward the east on an axis in the San Joaquin Valley. This cataclysm raised the eastern edge, the Sierra Nevada several thousand feet above the former level.

Before this upheaval, most of the major streams ran north or south; but after the tilting of the surface, the streams, finding their former routes blocked, made new courses down the slopes to the west, and gouged out the Yosemite canyons, such as the American, Stanislau, Merced, San Joaquin, Kings, and Kaweah Rivers. The Kern River was forced to flow to the south because of a secondary uplift which produced the Great Western Divide.

The original tilted plane was relatively flat when first uplifted, but the action of glaciers on the higher parts and of water on the lower and steeper slopes has gouged out the valleys and the ridges until the present rugged topography was produced.

By observing carefully from any promontory in the Sierras, such as Moro Rock, an imaginary line may be drawn through the tops of the high points from the San Joaquin Valley to the west, to the crest of the Sierras on the east. It will be observed that the comparatively smooth plane tilted at an angle of about 6% which extended over this whole area before the elements had carved out the deep canyons and sharp ridges of today.

GEOLOGY OF MORO ROCK

Moro Rock is one of a series of batholiths, similar to El Capitan and Half Dome in Yosemite, Tehipite Dome in the Kings Canyon, and many others throughout the Sierras. They were created millions of years ago by a flow of molten lava which was forced up through the body of less resistant rock which overlay the surface of this region. The upward flow ceased while there was still several thousands of feet of softer sedimentary material (sandstones and shales) between the molten mass and the surface. This intrusive lava cooled very slowly, under immense pressure of the overlying materials and formed as it cooled into crystaline granite.

The material which covered these great masses of granite was gradually weathered away until the granitic core was exposed. Granite being extremely resistant to the action of water, temperature and chemicals, has eroded far more slowly than the less resistant materials surrounding it and has therefore remained after the other has been carried away. The actions of glaciers have had little if any effect on the erosion of this immediate area.

The appearance of these granite headlands is due to exfoliation, or the peeling of layers of the outer surface. This again is due to the strains induced by temperature changes between the hotter and more exposed outer surface and the cooler, less expanded parts below.