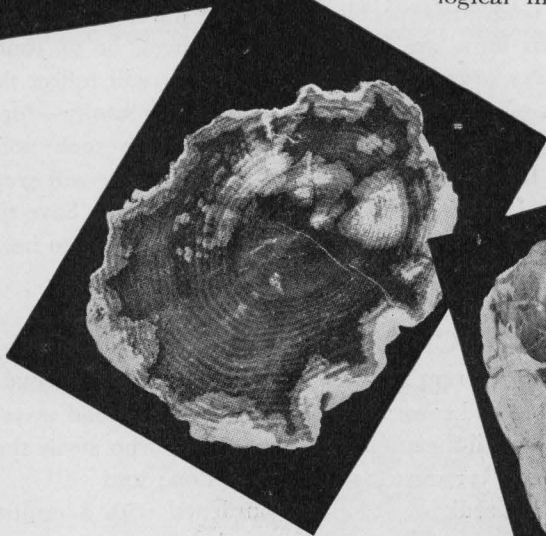
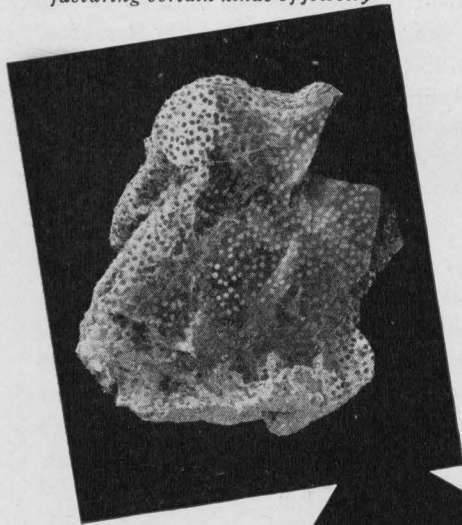




*This land, now barren and rocky, was once rich in trees and herbs that nurtured prehistoric horses, rhinoceroses and various other grazing animals and carnivores. This scene is near upper Last Chance Gulch*

*Below, a piece of petrified palm wood, a material which has been found valuable in manufacturing certain kinds of jewelry*



*Two polished pieces of petrified wood from Last Chance Gulch*



*Each ring represents one year in the life-story of the old trunk*

# MOJAVE'S *Petrified* FOREST

By CHESTER STOCK

THE beauty and picturesqueness of the badlands in Red Rock Canyon, eastern Kern County, are well known to all who have traveled by road between Mojave and Owens Valley. The casual wayfarer, who tarrys a moment to view the landscape in the vicinity of the old postoffice station of Ricardo, cannot fail to be impressed by the color and sculptured form displayed here by cliff face and rock slope. These scenic features, often shown in photograph, are largely the result of weathering and erosion—destructive geologic processes that are breaking down and carrying away the rocks exposed here.

Rock layers, or formations, of the earth's crust have often been likened to a book, each layer representing a page or tablet, perhaps, on which a geological story is revealed. The types of rocks out of which strata are built and the remains of once living organisms preserved in them supply some of the facts that are woven into the account of earth history.

An interesting chapter in the later geological history of the Mojave Desert is

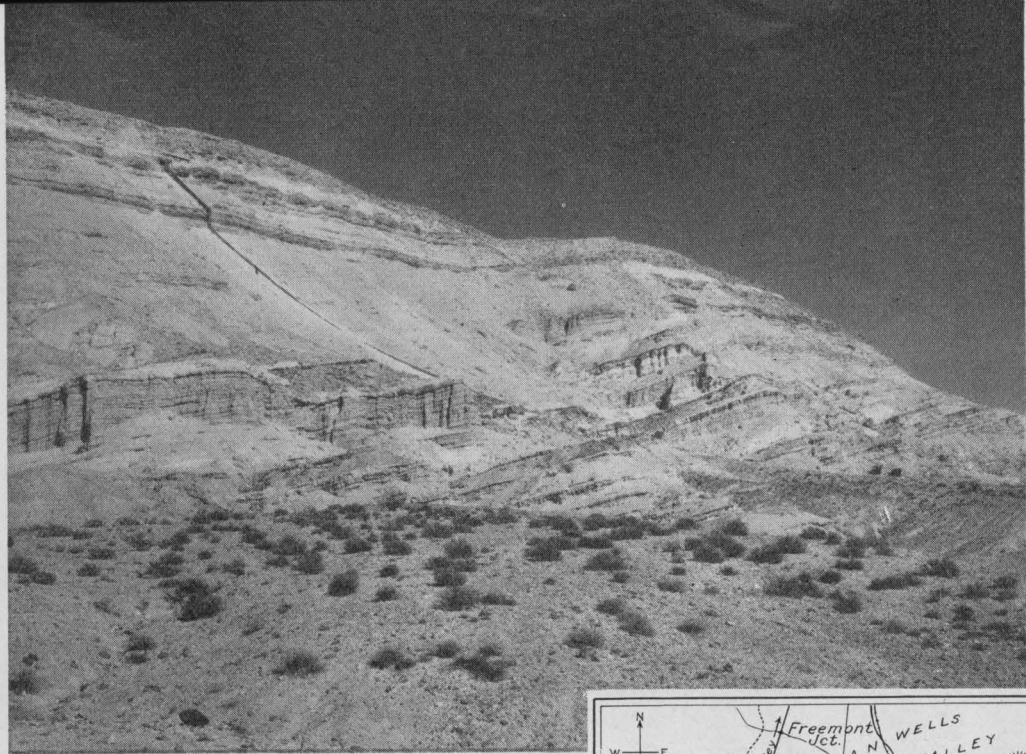
recorded by the deposits exposed in and about Red Rock Canyon. The Ricardo formation, as these beds are called, is made up of angular rock fragments, sandstones, clays and volcanic ash. Basaltic lavas lie interbedded in the lower part of the formation. Vivid colors are displayed by the outcrops of rocks below the lavas where shades of red and blue give warmth and beauty to the landscape. Above the basalts the sediments present mostly a gray, drab or buff color. The entire formation is more than 3,000 feet thick and lies upon older rocks that form the core of the El Paso Mountains. A good cross-section of the strata can be seen not only along the main highway in Red Rock Canyon and in the area adjacent, but also in the upper reaches of Last Chance Gulch, which cuts across the El Paso Range to the east of Red Rock.

Judged by its sediments, the Ricardo deposits were laid down on dry land and in water. Much of the material represents rock débris washed from a range of mountains that lay to the west. The formation was deposited originally in more or less horizontal position, but is now distinctly inclined toward the base of the Sierra Nevada Mountains. It is clear that earth movements have disturbed these strata since the period of their accumulation.

Out of the deposits has come one of the more important fossil assemblages found in western North America. At least five species of trees and more than twenty different kinds of animals are known to fossil-hunters who have examined the area.

At the Petrified Forest in upper Last Chance Gulch occur remains of trees now thoroughly silicified. Parts of trunks and roots are exposed where the surrounding sediments, which once covered them, have been swept away. Some of the trees stand rooted where they grew ages ago. Drift wood is also present and evidently came

Besides being a fascinating chronicle of long-dead ages, the Ricardo formation is proving its value in a very practical way by supplying glass froth or pumice which is used in manufacturing kitchen cleanser



from nearby localities. The most abundant tree is the locust and with it occurs a palm. Oak, pine and cedar have also been identified. With the exception of the cedar, all are known to be extinct species. Nowhere in the Mojave do we find living at present, in the native state, a flora with this combination of woody plants. Study of their modern equivalents suggest that the pine, oak and cedar grew at a higher elevation than the palm and locust. Somewhat similar conditions of growth are found today in the San Jacinto Mountains, although the native distribution of the locust tree no longer extends into this region. Study of the plant material shows that the climate was less arid, at the time the trees were alive, than is the case today in the Last Chance Gulch area.

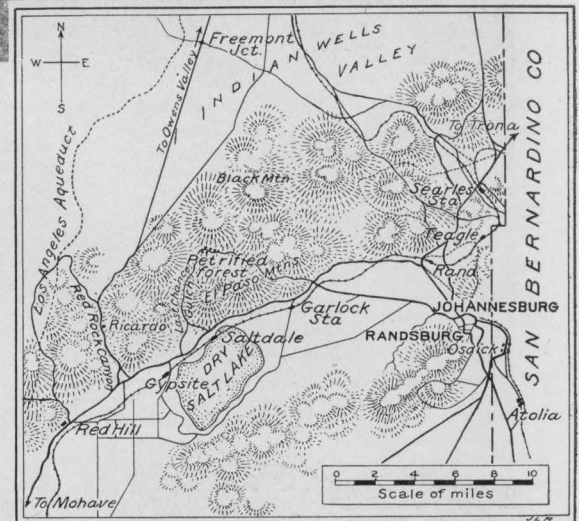
The presence of more herbage during that ancient time is demonstrated indirectly by the large and varied assemblage of animals whose remains are found fossil in the Ricardo strata. Noteworthy among the hoofed mammals are two kinds of rhinoceroses. Several species of horses likewise occur, including the 3-toed Hipparion, an animal having the size and speed of a gazelle. Among other hoofed mammals are several species of camels, an oreodont sometimes called a ruminant hog, an antelope with deer-like antlers, and mastodons. One of the latter was a shovel-tusker, distant relative of a peculiar type found by Roy Chapman Andrews in Mongolia. Occurring with the herbivores are their natural enemies, the flesh-eaters. These include dogs, ranging in size from small fox-like creatures to very large, heavy-jawed wolves, cats including a primitive sabre-tooth, and among the smaller carnivores, a weasel. All of these species have, of course, long since disappeared from the earth.

Thus when we look beyond the superficial beauty of form and color of the bad-

lands in the Red Rock Canyon region we find a story revealed in the rocks which captivates the imagination. Out of the past comes a picture of a land sufficiently varied in relief to permit the existence of different kinds of plants and animals. Presence of many grazing mammals implies more fodder and water than are found there today. The climate was such as to permit the growth of several species of trees, now foreign to the area, and doubtless succulent plants were to be found along stream courses. But these favorable environmental conditions were not destined to remain unchanged with the passing of time. Volcanic eruptions in the vicinity caused ash showers to fall, and thin sheets of molten lava to flow over the landscape.

The story unfolded here is one which dates from the beginning of the geological period known as the Pliocene, perhaps two million years ago. At any rate, some concept of its antiquity may be grasped when it is stated that all these events occurred before the uplift of the present Sierra Nevada Mountains.

*Slightly tilted by the movement of the earth beneath, this palm stands just as it did in life*



*Just a few miles east of the junction of the Red Rock Canyon route a desert road leads up Last Chance Gulch to the seldom-visited Mojave Petrified Forest*

