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## Geological Structure of the Jornada del Muerto and Adjoining Bolson Plains

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The Sierra Oscura-San Andreas range presents some features which are quite different from those already mentioned, which may be partly due to faulting at the time the blocks were tilted. The two parts of the range overlap somewhat, and dip in opposite directions. The major fault plane along which the block was upraised lies on different sides of the two parts of the range. Between the two parts is a flat plain, several miles wide, which, however, is considerably elevated above the plains on either side of the great ridge. The mountains are capped by Carboniferous limestones; so also is the small plain between. The section appears to be as follows (figure 7):

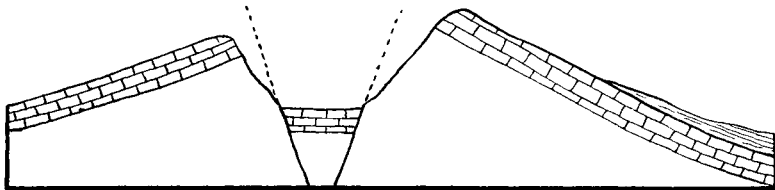


FIG. 7. Fault Block between the Sierra Oscura and San Andreas Range  
Displacement 2,500 feet.

## GEOLOGICAL STRUCTURE OF THE JORNADA DEL MUERTO AND ADJOINING BOLSON PLAINS.

BY CHARLES R. KEYES.

The recent visits of a number of the members of the Academy to the Tulerosa district and contiguous plains in New Mexico makes it seem worth while to call attention to some of the major geologic structures of the region.

The section represented below is in an east and west direction through the station of Engle on the Atchison, Topeka & Sante Fe railroad, reaching beyond Alamagordo on the El Paso & Northeastern railroad.

The section shows for the Jornada plain a simple synclinal structure, with profound faults on the opposite side of the marginal mountain ranges in either direction.

On the Rio Grande side of the Caballos range repeated faulting is indicated—the river occupying the minor fault-blocks next the great fault-block of the main mountain ridge.



FIG. 8. Geological Structure of Jornada and Tularosa Deserts.

The highest part of the Caballos exhibits very clearly the evidences of a profound thrust-plane the geological age of which greatly antedates the period of normal block faulting which gives the present characteristic aspects to the region. The Carboniferous limestones for a distance of three-fourths of the distance to the summit of the range stand nearly vertically. Erosion has bevelled the stratification planes at angles of about 35 degrees—the slope of the eastern side of the range. This imparts to all except the upper part of the mountain face a remarkably contorted appearance, with horizontal beds of the same composition capping the summit. The effect is almost inexplicable until the position of the thrust-fault is recognized.

Immediately east of the western rim of the bolson and between the Sierras de los Caballos and Fra Cristobal are a number of small lava cones 300 to 400 feet high, each of which send out a basaltic flow for several miles in all directions from its center. These basalt flows appear to cover some of the earlier mesa gravels. They are quite recent—probably early Pleistocene in age.

The gentle syncline of the Jornada is perhaps its most characteristic structural feature. It is to be noted, however, that this region is not a simple trough but a syncline which has experienced repeated, or rather continued, upturning

of its margins while the process of general base leveling was going on.

In the San Andreas range there is found a simple monoclinal block. The profound faulting is on the eastern flank of the range. From the foot extends another broad bolson plain extending to the foot of the lofty Sierra Blanca.

The faults represented indicate displacements of 3,000 to 5,000 feet.

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## NORTHWARD EXTENSION OF THE LAKE VALLEY LIMESTONE.

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BY CHARLES R. KEYES.

As a terran name Lake Valley is applied to a remarkable blue limestone occurring at the famous silver mining camp of the same title, situated in Sierra county, New Mexico. The formation is noteworthy for the reason that it carries the typical Lower Burlington fauna of Iowa. On this account it is of special interest to Iowa geologists.

The first recognition of the Lower Burlington fauna, a thousand miles away from the original locality, is due to Mr. Frank Springer, a former Iowan, and the leading authority on American crinoids.\*

At Lake Valley the limestone bearing that name is, as at Burlington, crinoidal in character. Mr. Springer, in the article cited, furnished a considerable list of crinoids as well as of other fossils, all of which are the most characteristic forms of the Lower Burlington limestone of southeastern Iowa. Since the appearance of the paper mentioned, twenty years ago, no further reference has ever been made to the Burlington fauna in southwestern United States.

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\*Am. Jour. Sci., (3), Vol. XXVII, pp. 97-103, 1884.