Lower Cretaceous stratigraphy of southwestern New Mexico

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Russel Soper Property nine miles southeast of Hatch, New Mexico. The occurrence is located at the western base of San Diego Mountain in the NE¼ of Section 36, T. 19 S., R. 2 W., Dona Ana County.

Outcrops of calcareous tufa deposited by Quaternary thermal springs are very common in this area. Radioactivity is restricted to a single lenticular outcrop of tufa deposited by thermal waters which emanated from between two layers of Tertiary volcanics, the upper – a rhyolitic breccia and the lower – an andesitic porphyry. Elsewhere in the immediate area the thermal springs, in general, flowed from Tertiary sand and gravel layers.

Occurrence of Radioactive Minerals in Pegmatites

Pegmatite dikes containing uranium and thorium minerals outcrop 11 miles northeast of Lordsburg, New Mexico, on claims owned by W. G. Weatherford of Lordsburg. The claims are in Sections 15 and 22, T. 21 S., R. 17 W., Hidalgo County.

The area is near the western margin of a large mass of Precambrian granite, schist and gneiss which has been intruded by numerous pegmatite dikes, also Precambrian in age. Uranium and thorium mineralization is associated with magnetite which is found coarsely disseminated in some of the pegmatites. Less commonly, the magnetite is found in small masses and stringers. Euxenite, allanite, cyrtolite, and samarskite have been reported from similar pegmatites in this district.

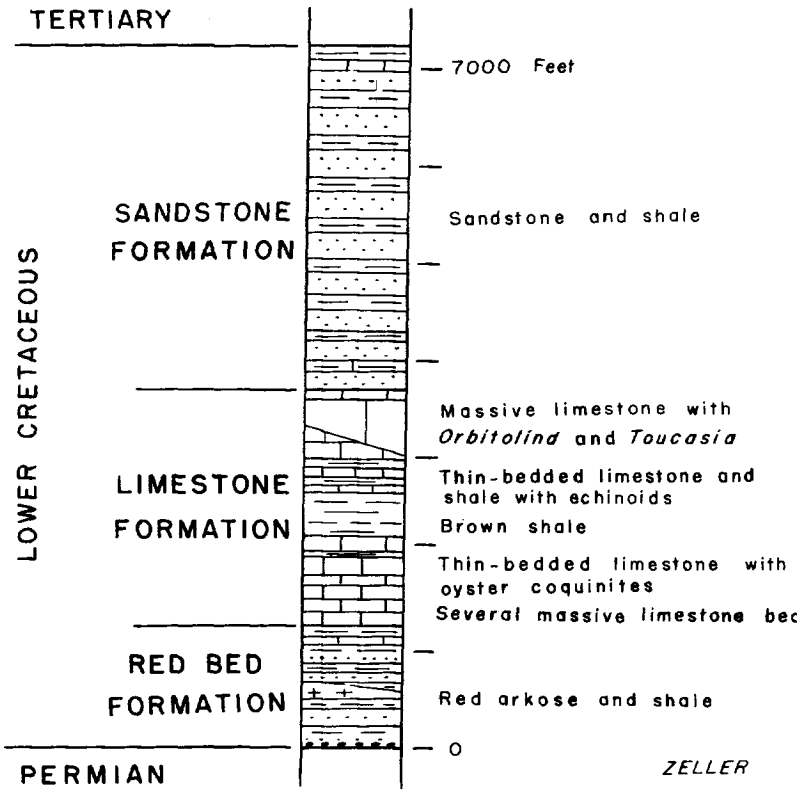
LOWER CRETACEOUS STRATIGRAPHY OF SOUTHWESTERN NEW MEXICO

by
Robert A. Zeller

Many geologists have been puzzled by the stratigraphy of the Lower Cretaceous rocks of southwestern New Mexico. A detailed study of the Lower Cretaceous beds of the region is in progress, but the work is not sufficiently advanced to yield a final solution to the puzzle. The general character of the section is described below and preliminary ideas on correlation are mentioned. These must not be interpreted as final conclusions.

Inasmuch as the Lower Cretaceous section in the Big Hatchet Mountains has been studied in detail by the writer, it is shown as a type section, and comparisons are made with other areas, largely from the literature.

GENERALIZED LOWER CRETACEOUS SECTION OF THE BIG HATCHET MOUNTAINS



The Lower Cretaceous section in the Big Hatchet Mountains is divisible into three lithologic units: a lower clastic formation, a middle limestone formation, and an upper clastic formation (see columnar section).

The lower clastic formation rests unconformably upon an irregular surface cut on Permian rocks. The thin basal conglomerate is overlain by alternating beds of red shale and arkose with a few gypsum beds. These red beds abruptly change in both thickness and lithology. No fossils have been found in the unit, but its Lower Cretaceous age is indicated by interbedded Lower Cretaceous limestones at the top.

The middle limestone formation varies laterally in thickness and lithologic character, but a general lithologic and faunal sequence is recognized over a large region. The lowermost beds in most places

are thin-bedded oyster-rich limestones with several massive local limestone beds. These limestones are overlain by brown shales, which grade into both the underlying and overlying limestones. Above the shales are thin beds of limestone bearing echinoids and **Orbitolina**. The echinoid limestones are overlain by a massive limestone bed several hundred feet thick, which contains **Orbitolina** and **Toucasia**.

The upper clastic formation, is composed mostly of quartz sandstone with some shale, and is locally interbedded at its base with thin limestone beds of the uppermost part of the medial limestone formation. Fossil wood is abundant. Several silty marine limestone beds occur in the uppermost beds exposed. This formation is overlain unconformably by Tertiary rocks.

These same three formations are recognized in the Sierra Rica, the Apache Hills, and in the Animas Mountains.

In the Cerro de Muleros, near El Paso, Böse (1910) describes a Cretaceous section composed of 250 feet of limestone of Fredericksburg and Washita age, overlain by 350 feet of quartzose sandstone of Eagle Ford age. This section is lithologically similar to the upper part of the limestone formation and the lower part of the upper clastic formation of the Big Hatchet area. However, the age of the limestone in the Big Hatchet Mountains is tentatively considered as the same as that of the similar limestone of the Little Hatchet Mountains, which is Trinity in age. A more thorough study of the lithology and faunas of these areas is required before a final correlation is made.

The lithologic and faunal similarity of the Big Hatchet Mountains Cretaceous succession with that at Bisbee, Arizona, (Ransome, 1904) is significant. At Bisbee the three lithologic subdivisions are recognized. The lower clastic unit, the Morita formation, is composed largely of red beds. It is overlain by a limestone unit, the Mural limestone, which has most of the general characteristics described for the corresponding unit in the Big Hatchet Mountains. The thin-bedded oyster-rich limestone is overlain by brown shale, which in turn is overlain by thin-bedded limestones bearing echinoids and **Orbitolina**, and which is capped with a massive limestone bearing **Orbitolina** and **Toucasia**. The limestones are overlain by a thick sandstone unit, the Cintura formation. At Bisbee the basal clastic formation is thicker and the limestone formation is thinner than in the Big Hatchet Mountains. The total measured thickness of Lower Cretaceous rocks at Bisbee is about 4200 feet, and in the Big Hatchet Mountains is about 7000 feet.

Anomalous to this apparently simple stratigraphic picture of southwestern New Mexico and southeastern Arizona is the 20,000 feet of Lower Cretaceous rocks reported by Lasky (1947) in the Little Hatchet Mountains. The writer believes that Lasky's section may include at least one duplication. If this contention is true, the section in the Little Hatchet Mountains will be virtually the same in lithology, fauna, and in thickness as that of the Big Hatchet Mountains.

VOLCANIC ROCKS OF SOUTHWESTERN NEW MEXICO

by
Eugene Callaghan

There can be little doubt that almost all of southwestern New Mexico as well as the adjoining part of Arizona was once covered by a great blanket of extrusive igneous rock which is co-extensive with similar rocks in the Sierra Madre Occidental of Mexico. Where this blanket overlaps the Colorado Plateau, as in the Datil region of New Mexico, it is still an unbreached cover but in the Basin and Range Province it is warped and broken. In many of the positive blocks the volcanic cover is stripped so that underlying formations are revealed and the volcanic succession is exposed.

The relation of the various units in the volcanic sequence can be important in the search for mineral deposits. Some units contain mineral deposits, some are later, and many cover or hide a deposit. The accident of erosion permitted the stripping of the post-mineral volcanic cover from the Santa Rita area so that the mineral deposits were revealed.

Probably the most abundant and certainly the most prominent part of the volcanic sequence is the group dominated by rhyolites and associated welded rhyolitic tuffs which is later than most of the intrusive igneous rocks and mineral deposits. These rocks tend to stand out prominently in cliff slopes and to make up large parts of many of the ranges, particularly near the Arizona line. The group differs from place to place and contains basaltic andesites, possibly some andesites, and latites of varying composition. The exact age of these rocks is un-