

cussed and evidence is presented demonstrating the presence of a Permian section nearly as complete as that of the Glass Mountains, as well as a fairly complete Pennsylvanian sequence.

10. LOUIS V. OLSON, assistant director, Agricultural Research Department, American Smelting and Refining Company, El Paso: Aerial Photography for Geological Exploration.

The use of aerial photographs has gradually increased until at the present time no important surface geological work or any other surface exploration work, such as for power lines, canals, or pipe lines, is undertaken without the preliminary of an aerial survey. The sensitivity of the modern photographic materials is such that by the proper use of light filters slight color changes may be detected denoting changes of bedding planes which could not be detected by the eye. Stereoscopes have been developed that make it possible to detect even minor changes in elevation. Sketching of contours on the photograph tends to eliminate laborious ground survey work. Of course, the stereoscope also indicates the relative hardness of adjacent terrain, which is very important in tracing rock formation.

11. CARY P. BUTCHER, geologist, Tide Water Associated Oil Company, Midland: The Guadalupe Mountains as They Look to the Aerial Geologist.

Stratigraphy in the Guadalupe Mountains is definitely related to contemporaneous structural movements. These relationships become obvious to the aerial observer. They become a part of his permanent record when they are photographed. Initial ground reconnaissance is advisable, and subsurface data should be given careful consideration. Such procedure has been followed in the Guadalupe area. Aerial observation is of great value even prior to surface or subsurface study. Thus time is saved, especially as the observer gains in experience. Hence these progressive aerial obliques of the Guadalupe Mountains are presented in the hope that they will be of value in better understanding subsequent papers and field trips. They culminate work begun in 1928. Views are east-northeast, and the progression is in a northwesterly direction. A simple cross section is added in further explanation.

12. RONALD K. DEFORD, geologist, Argo Oil Corporation, Midland, GEO. D. RIGGS, consulting geologist, and NEIL H. WILLS, consulting geologist, Carlsbad, New Mexico: Surface and Subsurface Formations, Eddy County, New Mexico.

This is a preliminary report on incomplete surface and subsurface studies in Eddy County and adjacent areas. Results so far are as follows.

The Yates sand has been traced from subsurface into the surface outcrop, and the top of the Yates mapped from Carlsbad to McKittrick Canyon.

The subdivision of the Whitehorse-Capitan is simplified, making it more suitable for daily use by subsurface (and also field) geologists. From top downward it is subdivided into Carlsbad, Yates, Seven Rivers, Queen. This involves redefinition of the Carlsbad.

The gradation of Whitehorse into Capitan disposes of the untenable theory that the Whitehorse is Triassic. Yates sand passes beneath beds containing Permian (Guadalupian) fossils.

Even the youngest Carlsbad grades laterally into massive Capitan limestone, and all the Capitan limestone grades into the upper 800 feet of the