

tinental drift recently published by the American Association of Petroleum Geologists, we find several statements made both for and against this theory of origin.

In order truly to understand the origin of this formation it seems advisable that we endeavor to visualize the geography of the general area during the Pennsylvanian time. The accompanying map² gives in a general way the paleo-geography of the western half of Colorado during this time. Of necessity, the exact boundaries of the lands and seas are only approximate, partly because we have not sufficient detailed field information, and partly because there were oscillations in the shore line from time to time. The map is constructed on the basis of such data as overlaps of the Pennsylvanian on older beds, character and direction of cross-bedding, positions of coarsest deposits, and the directions of gradations of sediments.

To the west we find one great land-mass which by some has been called the Sawatch and by others the Uncompaghre land or island. Its eastern boundary came down through the San Luis Valley. It seems to have been one of the oldest and most positive areas in Colorado, having originated during the Archeozoic, and apparently it has never been completely covered by marine waters since.

A second and somewhat smaller land-mass extended down from the north to the east and northeast of the Sangre de Cristo area. It has been called the Wet Mountain land-mass, and included the area from what is now the eastern flank of the Wet Mountains westward into what is now the Wet Mountain Valley, and in a number of places westward to the base of the present Sangre de Cristos. The present Wet Mountain Valley is of very recent geologic origin, having been produced by erosion and down-faulting in late Tertiary time.

An arm of the sea extended down between these two land masses; forming a long, narrow, and rather shallow body of water.

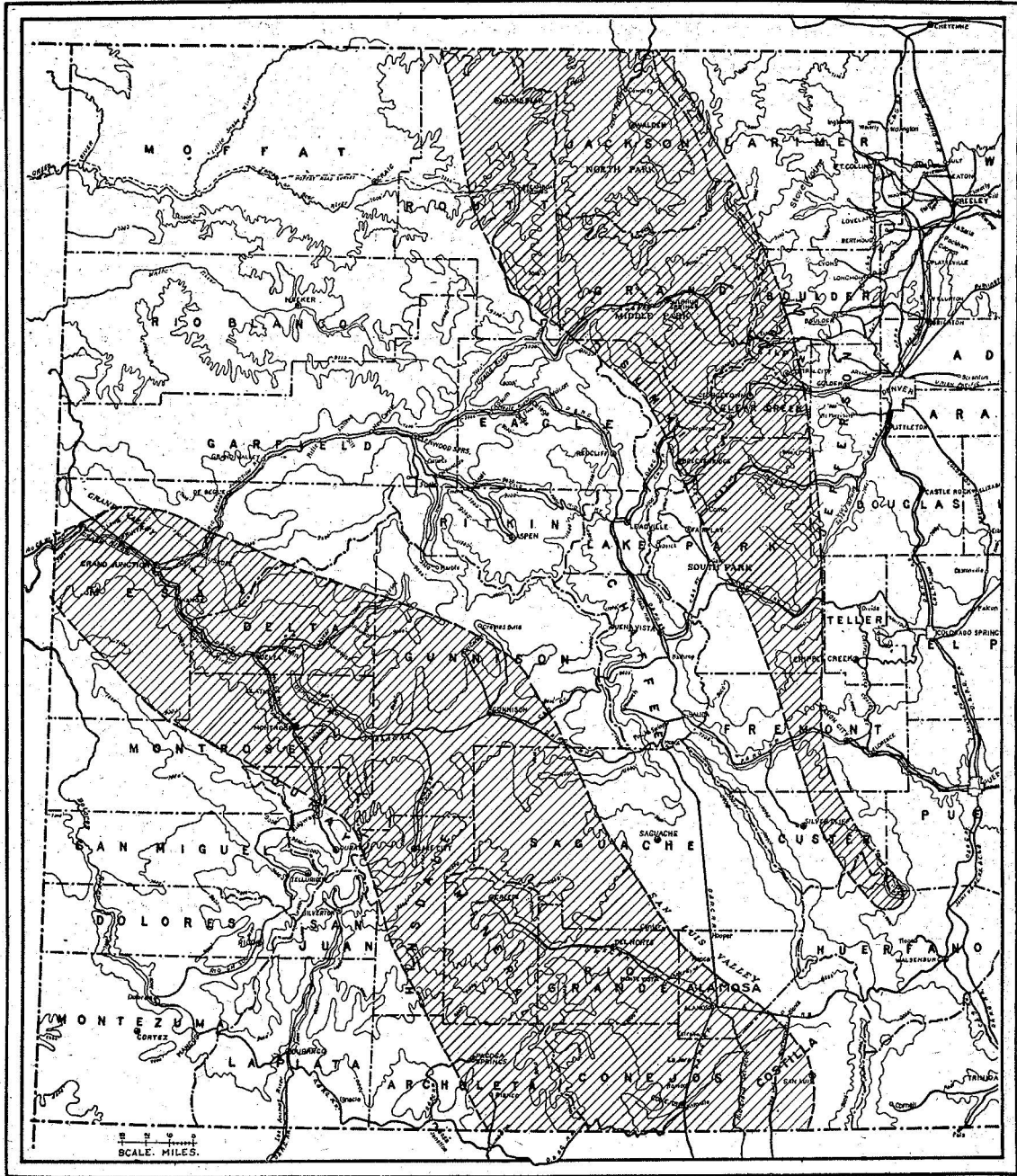
In general, the deposits are lenticular, highly cross-bed-


²The data for the western portion of this map was largely supplied by Mr. Harry Baldwin.

ded, and coarse, but they vary rapidly in character both vertically and horizontally. The color of the sediments varies from red and brown to gray and black, with the red and brown predominating. In several places we find beds which contain great quantities of vegetable material, mainly fragments and impressions of calamite stems. In one place these were so abundant as to give rise to thin, highly carbonaceous beds resembling impure coal. No striated boulders could be found. The lenticular beds and the character of some of the crossbedding indicates stream work.

The upper Sangre de Cristo formation represents deposits in part marine and in part subaerial in origin. It includes shore-line deposits formed along steep shores, normal littoral and near littoral deposits, alluvial fans, the ends of many of which extended into the sea, some flood plain, delta, and a few small swamp deposits. The beds of each type of deposit blend rapidly into one another.

To the writer there was absolutely no evidence of glaciation to be found anywhere in connection with these deposits. The coarse, sub-angular character and great size of some of the fragments can be easily explained as the work of steep, possibly torrential, streams, and in some localities where we find huge blocks imbedded in fine material, as the work of waves undercutting a steep shore. In fact, in most places we can see almost identical material being formed by the present streams of the area in the great alluvial fans which they are now building. The few fossils found in the beds suggest a mild to warm climate, not a cold one.



MIDDLE PENNSYLVANIAN LAND AREAS 

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