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Beginnings of Desert in Iowa

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planation. So the Devonian hiatus of the upper Mississippi Valley and the major unconformity which marks its horizon links up with the Far West rather than the East. Consequently we have to reverse our methods of procedure and study anew our Mid-West Devonian rocks on the basis of their western relationships.

As already intimated, the diastrophic significance of our Early Devonian hiatus and the global affinities of the Late Devonian rocks of our state are little regarded. Yet, they are expressions of some of the most important continental oscillations of which we know. They are really a direct reflection of fundamental changes in North American paleogeography as clearly revealed, once we have the proper clue, as that unearthed recently in the far-off Cordilleran region. In our state both the basal unconformity feature, and the derivation and migration of the contained faunas are well worth closest scrutiny.

BEGINNINGS OF DESERT IN IOWA

CHARLES KEYES

(*ABSTRACT*)

Iowa, with its thirty odd inches of annual rainfall, is at the present time well within the garden tracts of Earth. Today we are really living in the middle of an interglacial epoch which does not yet reach its arid zenith. Were we not fully cognizant of this circumstance, and were we not looking for some first traces of such climatic transmutations, as in childhood we hunt for four-leaved clover, the clues might easily escape notice. Being on the alert, however, smallest signs are replete with deepest significance. It thus happens that our future desert conditions are already in sight, faintly though they be on the horizon.

Now the boundary line between desert and garden is not a conspicuous feature of the landscape as is a river or a mountain range. It is not two sharply contrasted areas separated from each other as is Nebraska and Iowa by the Missouri River. The two tracts do not meet in clear, straight line as the strand-line of the ocean. The one does not suddenly begin where the other suddenly leaves off. Boundary between desert and garden is a very broad, irregular and moving belt in which there is deep interfingering of barren and vegetative strips. Beyond the finger ends there are in one direction oasial spots which gradually grow smaller and smaller, and farther and farther apart, until they finally fail altogether. In the opposite direction are verdureless patches which

become less and less in evidence, until they at last merge into the general sea of green.

In western Iowa, on the loessial bluffs of the Missouri River, and on the deeply dissected hills beyond, the especially porous soils allow ready underdrainage of the rain-fall, while the south-facing hill-sides are exposed to the direct rays of the sun, and the parching winds off the southwestern deserts. These desert spots are as typical as any arid areas in the west, and they differ from them in fact only in the somewhat closer setting of the characteristic grass bunches.

Since the interglacial epoch in which we are living has not yet reached meridian these local desert conditions may be expected to spread and extend, until they cross the Mississippi River and perhaps the continent.

NOTES ON THE PHYSIOGRAPHY OF SOUTHWEST-ERN NORTH DAKOTA

PHILIP B. KING

Outlines the physiographic history of southwestern North Dakota; describes terraces and terrace gravels along Cannonball River, particularly in regard to pebbles of material not now found in the drainage basin of the stream; and suggests the existence in the area of an easterward dipping upland surface with possible continuations eastward and westward upon which the present streams, notably Missouri and Little Missouri, have anomalous courses.

THE APACHE REGION, ARIZONA, AND ITS INDIANS

ALBERT B. REAGAN

The subject of this paper is considered under three headings: geology, archeology, and ethnology. The geological part, though introduced mainly as an introduction to the archeological-ethnological sections of the article to show what kind of a country the ancients lived in and the present aborigines occupy, gives the formations in detail from the Ellison Dome on the west line of the reservation eastward across it, giving them as successively exposed around the dome and in the canyons from the older pre-Cambrian to the Quaternary. The archeological part gives the ruins of the region in detail, bringing to light many ruins that had not been previously known. It also gives the definite location and a short