

1917

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Recommended Citation

Kay, George F. (1917) "Pleistocene Deposits between Manilla in Crawford County and Coon Rapids in Carroll County, Iowa," *Proceedings of the Iowa Academy of Science*, 24(1), 99-100.

Available at: <https://scholarworks.uni.edu/pias/vol24/iss1/17>

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PLEISTOCENE DEPOSITS BETWEEN MANILLA IN
CRAWFORD COUNTY AND COON RAPIDS IN
CARROLL COUNTY, IOWA.

ABSTRACT.

GEORGE F. KAY.

The most significant features that have been revealed by a study of the Pleistocene deposits in many deep cuts made recently between Manilla in Crawford county and Coon Rapids in Carroll county, by the Chicago, Milwaukee and St. Paul Railway Company, may be summarized as follows:

1. The chief kinds of material exposed are loess, Kansan gumbotil, Kansan drift, Nebraskan gumbotil, and Nebraskan drift. In no one cut is it possible to see all of these materials, nor are the two gumbotils exposed in a single cut. In some cuts the section shows loess, Kansan gumbotil, and Kansan drift; in other cuts there may be seen loess, Kansan drift, and Nebraskan gumbotil; in still others loess, Nebraskan gumbotil, and Nebraskan drift. The most comprehensive cut is about one and one-half miles west of Manning. It shows loess, Kansan drift, Nebraskan gumbotil, and Nebraskan drift.

2. The two drifts, the Nebraskan and the Kansan, are much alike lithologically, and both appear to have undergone similar changes. On each of the drifts, gumbotil has been developed, below which there is a narrow zone of leached drift, which grades downward into unleached drift with many concretions.

3. The maximum thickness of the Nebraskan gumbotil is about thirteen feet, and of the Kansan gumbotil more than twenty feet. The zone of oxidation of the Nebraskan drift is not fully exposed in any of the cuts; the greatest depth of oxidation seen was seventeen feet. The zone of oxidation of the Kansan drift has a maximum depth of about forty feet. Beneath this oxidized zone, in a few cuts, there was seen less than ten feet of very dark, tenacious, unleached and unoxidized Kansan drift.

4. The Kansan gumbotil is limited in distribution to a few narrow divides which are erosion remnants of a former, extensive, Kansan gumbotil plain. These divides are the present up-

lands of the region. The Nebraskan gumbotil is exposed only in those cuts the summits of which have been brought by erosion considerably below the elevations of the summits of the upland cuts.

5. The loess is present as a mantle over the maturely dissected surfaces. It varies in thickness from a few feet to more than twenty-five feet. In general it thickens from the crests of the ridges down the slopes, and is apparently thicker on east slopes than on west slopes. The upper parts of the ridges have been broadened more than heightened by the deposition of the loess. In places the loess lies on Kansan gumbotil; in places it is on Kansan drift; in other places it mantles the Nebraskan gumbotil; and where there has been the most extensive erosion previous to the deposition of the loess, it is on Nebraskan drift.

6. The loess has two phases, the upper of which is buff in color, the lower, gray. In many places the buff loess is leached for a few feet from the surface; in a few cuts the depth of leaching is about fifteen feet. The buff and the gray phases of the loess are closely related, and the evidence indicates that their differences are the result of chemical reactions rather than of different epochs of deposition.

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