Road cuts review ancient history

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A source of cheap, sometimes mind-bending, entertainment is a new roadcut. From the car window a cut may not look especially exciting, but closer inspection often reveals the fresh cut to be a realing window into the past-- if one can understand what there is to see.

Recent roadway improvements on the University's Fairbanks campus opened up a 40,000-year record of wind-blown silt (loess) deposition, volcanic ash falls, soil formation and disturbances caused by frost action. Several knowledgeable geologists, including Robert M. Thorson and Richard D. Reger, were close at hand so it was possible to develop a fair interpretation of the sequence of events that caused the complex layering seen in the cut bank.

The picture is one of changing climate. Silt exposed near the bottom of the cut appears to be laid down by winds blowing off the glacial outwash plains to the south during a period of extensive glaciation that occurred more than 40,000 years ago. Afterwards, during an interglacial period, plants and trees grew for many years and developed a thick, brown soil layer.

One of the roadcut's curiosities is the folding that developed in the ancient soil layer and in a new layer of silt the winds of a later time deposited upon it. The folding must have taken place at a time when permafrost anchored the deeper soil but when freezing and thawing of the soil near the surface caused that soil to move downhill. That movement, called solifluction, is a common phenomenon frequently seen on hillside slopes of Alaska and northern Canada. Like folds on an elephant's skin, solifluction lobes skirt many tundra-covered hills.

Subsequent to the folding, a new glaciation occurred in the Alaska Range to the south, and again the winds carried in new loess. The light-colored silt layer above was laid down until, about 14,000 years ago, the glaciers receded and no longer supplied new silt for the wind to carry. Mosses and plants grew on the surface and developed the layer of soil found there now.

Deep within the roadcut is a whitish layer of volcanic ash, one of several found in central Alaska and adjacent regions. Several volcanic eruptions during the pas hundred thousand years have created widespread ash layers across Alaska and western Canada. These serve nicely as time markers. The ash layer in the campus roadcut is thought to be the Old Crow ash bed probably derived from an eruption, more than 53,000 years ago, of the Wrangell volcanoes or perhaps from another similar volcanic source near the Alaska-Canada border.

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