On this outline of South Dakota, the gray flat-iron shaped area on the eastern edge is the Coteau des Prairies; the white area is the ice sheet which flowed into South Dakota from the northeast and which was divided by the Coteau; the two arrows represent the directions of flow of the two lobes which resulted from the divided ice sheet; and the diagonal lines represent the ice-free areas of the state which were not covered by the late Wisconsin glaciation.

Credit: PLEISTOCENE GEOLOGY OF EASTERN SOUTH DAKOTA by Richard F. Flint.

Dakota Conference
Center for Western Studies
Augustana College
Sioux Falls, South Dakota
April 24, 2004

MINNEHAHA COUNTY HISTORICAL SOCIETY
Following the retreat of the late Wisconsin glacier and the end of the Ice Age, a number of species of huge mammals became extinct. Scientists speculate that several factors contributed to their extinction. These included rising temperatures, a warming climate, changes in the types of grasses, shrubs and vegetation which affected their daily diet, and the entry of the first humans to the continent who hunted many of these large animals for food.

A receding glacier leaves considerable evidence as to its existence. Debris called till left by earlier glaciers is molded into elliptic drumlins under the ice. Loose till settling into a cavity in the glacier would build a kame. Till in a meltwater tunnel beneath the ice would create a curved mound called an esker. A terminal moraine is a massive wall of debris that marks the end of the glacier's advance. The terminal moraine also might dam meltwater to create a lake. Kettle lakes are formed by the melting of subsurface ice. *Credits: GLACIER* by Ronald H. Bailey.
THE GREAT BEND

A highland existed along the east side of South Dakota long before the Ice Age began two million years ago. Successive periods of glaciation deposited sediment across the highland and increased its elevation.

The last glaciation began 35,000 years ago during the late Wisconsin Stage. By then the highland had become a barrier that divided the ice sheet into two south-flowing lobes: the James Lobe to the west and the Des Moines Lobe to the east. When the James Lobe reached the nearby southwest corner of the highland, it turned to flow east.

In time the glacier began to recede. Meltwater flowing south down the Skunk Creek and Big Sioux River valleys was dammed by the James Lobe, causing it to flow east to Tuthill Park. There it was diverted several miles north before joining the Slip-Up and Split Rock creeks and then resuming its southerly flow. In this manner the Great Bend of the Big Sioux River was created by the James Lobe about 15,000 years ago.

Glacial deposits overlay the flatiron-shaped highland that is now called Coteau des Prairies.

DEDICATED IN 2004 BY THE MINNEHAHA COUNTY HISTORICAL SOCIETY AND THE CITY OF SIOUX FALLS
This illustration depicts how far the James Lobe and the Des Moines Lobe advanced. Note that while the late Wisconsin glacier did overrun the northern part of the Coteau des Prairies, eastern Minnehaha County and all of Sioux Falls were ice-free. Note also that when the glacier retreated, the meltwaters along the western edge of the James Lobe created the Missouri River in South Dakota. Courtesy of Dennis Tomhaye.
Fort Dakota (1865 - 1869) was located on North Phillips Avenue between 7th and 8th Streets. By Order of President Andrew Johnson, a 70-square-mile military reservation was established around Fort Dakota. This map of the military reservation was drawn circa 1867. It clearly depicts the twists and turns of the Big Sioux River as it heads in a southerly line toward the boundary line between Minnehaha and Lincoln counties. At that point, the Big Sioux River, dramatically veers east to Tuthill Park and then turns sharply to the north. A perfect hairpin curve!
At the time of the maximum glaciation 18,000 years ago, there were ice sheets one to two miles thick. They covered much of northern North America, northern Europe, Scandinavia, Finland, and northern Siberia.


The massive late Wisconsin glaciation is dramatically shown in this drawing. Note that Seattle, on the West Coast, and New York City, on the East Coast are both buried under the ice sheet.
PROGRAM

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Emcee
Emma Abbott

Principal Remarks
Dennis Tomhave

Dedication

Unveiling

MINNEHAHA COUNTY HISTORICAL SOCIETY
REGISTERED HISTORICAL MARKERS NOW TOTAL 109.
Five of these markers involve Earth history:

1. THE SIOUX QUARTZITE Falls Park, Sioux Falls
2. 1938 EARTHQUAKE, Northern Links Golf Course, Renner
3. INLAND SEAS, Falls Park, Sioux Falls
4. CACTUS HILLS, Great Bear Recreation Park, Sioux Falls
5. THE GREAT BEND, Yankton Trail Park, Sioux Falls

Dennis W. Tomhave is a geologist with the Department of environmental and Natural Resources, Geological Survey Program, University of South Dakota. This is the fourth Earth history geological marker dedicated by the MCHS where Dennis has been the presenter. Dennis has made available to lay students, parents, and others, factual stories about the geological history of Minnehaha County that were previously largely known only by professional geologists. Thank you, Dennis!