The following article is Part III of a series on the history of District 1, beginning with the formation of the land in Part I and continuing with the geology of aquifers beneath the area in Part II. Part III explores the advent of life patterns established here within the context of glacial advances and retreats. It was written in 2005.

The Many Worlds of District 1

Part III: Come the mammoth

After the glaciers

Ice a mile thick seems forever. It's not. The day arrived, about twelve thousand years ago, when District 1's most recent glacier began to crack. It wasn't the first time. District 1 has felt the underside of many glaciers, both before and after it migrated to its present location after the breakup of earth's single supercontinent less than 200 million years ago.

Glaciers are measured in "ice age cycles," each lasting about 100,000 years. Clusters of ice age cycles interspersed with warmer periods are called "ice epochs," which last two to three million years. Groups of ice epochs, in turn, form "ice eras."

For the last billion years of earth history, our planet has been cool enough for glaciers to occur. Since then, there have been major glaciers and minor glaciers, advances and retreats---but not at random. Four periods have seen extensive glaciation: the Late Proterozoic period (between about 800 and 600 million years ago); the Pennsylvanian and Permian periods (between about 350 and 250 million years ago); and the late Neogene to Quaternary periods (the last 4 million years to the present). Lesser glaciation occurred during the Ordovician period 500 million years ago and during the Silurian Period, about 420 million years ago. Whatever their cause, mountainous layers of ice have come and gone in cycles, during epochs, over eras, here as elsewhere on earth. But glaciers have been retreating since about 1850 at an ever-accelerating rate linked to industrialization and the burning of fossil fuels. District 1 is not likely to see a new glacier anytime soon.

And long after the sea

The miracle of life occurred about 3.8 billion years ago, limited at first to extremely simple bacteria, then to primitive multicellular organisms. The first fishes arrived in the Ordovician Period, 450 to 500 million years ago, evolving in the shallow waters of a vast epicontinental sea that covered much of what is now North America, including District 1.

In our corner of that epicontinental sea, ancient cousins of modern fish eluded (or not) prehistoric sharks which began to appear 455 to 425 millions years ago. The sea remained here until about 430 million years ago, when it started to recede. The Pennsylvanian and Permian periods, noted above, produced swamps and coal forests and gave rise to the first reptiles and vast conifer forests. Dinosaurs emerged (though perhaps not here if remnants of the sea remained) and dominated life on earth for roughly 50 million years. Then suddenly, they were gone.

Whatever happened, possibly an inability to adapt to a cooling climate, climaxed by the planet-deafening bang of an enormous asteroid, dinosaurs went extinct about 65 million years ago. The king

was dead. The new king---mammals---evolved during those 65 million years that stretch to the present. Mammals are marked by an impressive adaptability to diverse climates that allows their spread over vast terrain. That adaptability was particularly evident in hominids---members of the bipedal primate family that ultimately included humans---who originated in Africa as far back as 7 million years ago. But they didn't come here.

Hominids migrated from Africa into Asia, including northern China, and left stone tools behind as early as 1.36 million years ago. They didn't make it here, either. But anatomically modern Homo sapiens, the only Homo subspecies not to go extinct, ventured out of Africa about 150,000 years ago, taking several routes, probably in pursuit of migrating food supplies. They might have moved so slowly that they gradually became accustomed to decreasing temperatures.

For tens of thousands of years, members of Homo sapiens sapiens---our subspecies---trailed mammoth and caribou into the New World via the then-existing land bridge connecting Siberia to Alaska. They spread throughout the continent, more densely into warm climates, sparsely into cold. A chilly terrain made it harder to survive but provided isolation from competitors who might kill humans outside their group, especially if it meant not having to share.

So, as the last ice left, human hunters arrived here, following herbivorous mammals that typically climbed the green arc of grassland in the vast melting fields of the glaciers. Ice was the frontier. Like most frontiers, it combined danger with opportunity. The greatest opportunity was ***food.***

Perpetual struggle

It is difficult to imagine the peril of life in District 1 twelve thousand years ago. The climate in summertime resembled our modern winter. Prehistoric winters were arctic. Even huddled together and sharing to maximize survival within a clan, many early humans would not have made it through the long, dark night from fall to spring, especially infants and young children. Small groups camped in open air sites, traveled with domestic dogs, summer and winter, constantly moving in search of sustenance.

Hunger, cold, disease, and accident were threats encountered every day. A multitude of large creatures, called mega-fauna, were also fearsome. They included mammoths, mastodons, tapirs, musk oxen, giant ground sloth more than 20 feet long, giant bison and beaver the size of black bears. They ate plants and thrived in chilly air. The glaciers provided both.

The surfaces of receding glaciers were littered with life growing in such a thick layer of debris on the top of the ice, a mammal walking through might not realize that ice lay beneath. The debris consisted of boulders, broken rocks, clay, sand and gravel, mixed together into a till adequate to support grasses and shrubs. In nearby spots, where the glacier had melted entirely, seeds carried in the fur of a passing mammal or blown in by the wind could put down roots in deeper soil, growing tall on the rich organic material from plant forms that had previously lived and decayed between glacial invasions. District 1 was probably a hilly forest when humans made their entrance. They roamed through shifting terrain, with melting mountains of ice as a moving backstage.

To survive

Gathering seeds and berries may have been part of survival strategy in human society twelve thousand years ago. But hunting was the focus. Early humans carved wood and stone to form weapons of considerable cunning. They used every part of the slaughtered prey for something: flesh and marrow as food, sinews, bone, and fur to make clothing, shelter, adornment, perhaps icons. Above all, human predators had to devise and form new tools to kill more prey. The more successful a band's struggle to survive and multiply, the more food and shelter were needed and the more tools to continue killing to continue surviving.

The clovis point spear is the most prominent example of a valuable prehistoric weapon. It was a reloadable chert-tipped device that could be thrown 10 to 20 feet. (Chert is a dense rock of microcrystalline quartz.) A band of hunters might use such a spear to pick off animals in a surprise attack at a watering hole or to frighten a herd into stampeding over a cliff (the bluffs above Warner Road come to mind). Fire was another such weapon, one that could be combined with spears to send whole herds in a desired direction. Whatever method or tool, early humans needed all their superior intelligence to snatch the life of a relatively small animal that could run much faster than man, or to take on a colossus like the 14-foot wooly mammoth, whose six-foot curved tusks could eviscerate a human torso in an instant.

Traces

Archeologists deal with very limited evidence and speculate on the meaning of what they find, always searching for new evidence. Artifacts that date to human life here twelve thousand years ago are rare. An arrowhead 11,000 years old was once found south of the Mississippi River in St. Paul, but the site did not yield anything else that could explain how it got there. Mammoth bones marred by cut and chop marks have been found, along with clovis points, in digs from Alaska to the tip of South America---including places in the Midwest---and give rise to the image of ancient killing fields.

But new information often raises more questions than it answers. The teeth and tusks of ancient mastodon, the bones of giant bison or the incisors of a sloth sometimes turn up in gravel pits, during deep excavation for new construction, at the bottom of a lake or in the muck beneath a marsh. In what context did they get there? Were there other clues missed because evidence disappeared? It's possible that fossils or ancient tools have been picked up over the years by people who did not recognize what they'd found and threw it away. It's also possible that much of the evidence was swept away by water.

Water, water everywhere

When our most recent glacier cracked and began to melt, ice a mile thick became water. A lake large enough to be considered an inland sea, called Agassiz, at one time covered the eastern Dakotas, northwestern and northern Minnesota and a portion of central Canada. Its meltwaters slipped south to flood the Red River Valley and spread to form thousands of lakes nestled into low spots and crevices. The drainage from Agassiz also flowed here, crashing into an ancient valley to the east of downtown St. Paul. The resulting waterfall, about a mile wide and nearly 200 feet high, could be compared to modern Niagara Falls. It fed a deep, raging river that filled the western edge of District 1. Creatures watching from the banks of this wide, deep river, whether mammoth or man or some other mammal, did not live in tranquility.

Mammoth versus man

As an adult, the great wooly mammoth ate approximately 400 pounds of food a day. It needed to build up fat in summertime in order to make it through the winter. The male might stand 11 foot at the shoulder and weigh 7 tons. The mammoth's body was nevertheless compact, designed to conserve energy. It had coarse hair 2 to 3 feet long---hence the "wooly." Its predators were many, including wolves and cougars. But the most feared enemy was the man with the spear, especially if the mammoth were sick or injured or got separated from the rest of the herd and found itself surrounded.

An early human in District 1, eleven or twelve thousand years ago, lived among a teeming population of ferocious neighbors, of whom the most physically impressive was the mammoth. He lived in a wild, wet and cool neighborhood, with a weapon and a plan always in hand if he were to survive. Homo sapiens sapiens succeeded over many generations, while other species mysteriously disappeared.