Chapter V

GLACIAL LAKE AGGASSIZ

It may be difficult for people today to believe that great glaciers once moved down from the north and that these great sheets of ice moved across the length of Minnesota and extended down into Iowa; that the great lobes of ice sheet as they planed off the surface of the land left great deposits of soil and rocks which formed terminal and lateral moraines which held back the water as the ice melted. The enormity of the ice sheet and the volume of water produced from the melting ice challenges the imagination as geologists unfold the history to us.

Mute evidence that a great ice sheet did move over Minnesota can still be seen today in the planed-off outcroppings of the original granite near Clementson, Minnesota, and the bald granite ridges in southern Ontario, Canada. Other cumulative evidence of the action of the ice sheet lobe in this area can be seen in the terminal and lateral moraines of the southern counties of the Red River Valley and the definite shore lines of the receding glacial lake which are apparent on both the Dakota and Minnesota sides of the Red River Valley.

A famed geologist, Warren Upham, did pioneer work in tracing the shore lines of the great glacial lake for the Minnesota Geological Survey and the United States Geologic Survey. The name Lake Agassiz was given this prehistoric glacial lake by Warren Upham in 1879 in the Eight Annual Report of the Minnesota Geological Survey. According to Upham, the first true explanation of the lakes' existence was presented by a geologist professor of the university in 1872. Upham reports, "While the retreating ice sheet served as a dam to prevent water from the melting ice to flow northward, the overflow did go south through the Lake Traverse and Big Stone Lake area, through Brown's Valley to cut out the channel of what is now known as the Minnesota River Valley." This glacial river, which carved out the Minnesota River Valley, was named River Warren by Upham. Another famed geologist, who collaborated with and followed up the work of Warren Upham, was J. E. Todd. Todd, in Chapter V of the 1896-1898 Report of the Minnesota Geological Survey, Volume 4, gives an excellent report on the geologic history of Norman and Polk counties.

In discussing the history of the glacial Lake Agassiz, Todd reports, "The area was probably under the sea as late as the Fort Pierre epoch of the Cretaceous. It is not unlikely that the Silurian rocks also may be encountered by deep borings. After the retreat of the sea in the Tertiary period, the drainage was very likely toward the north and east as at present. Toward the end of the Tertiary, the drainage toward the north very likely became less abrupt because of the continental elevations toward the north and east. So far as is yet known, no buried channels of the streams
at that time have been discovered, but it is not unlikely that
deep borings, especially in the southeastern portion of the area,
may reveal the existence of such. The Quaternary History—it is
agreed by all students of the subject that the ice which occupied
this region came from the north and northeast. The ice was in­
dependent in its movements from the ice lobe which occupied the
upper Mississippi region. This is true at least in the latter part
of the history, which left its impression most distinctly on the
present surface of the country. The great lobe of ice which oc­
cupied the Red River Valley, it will be remembered, moved south­
ward and was divided by the eastern coteau in to the western lobe,
which crept down the James River Valley, and the eastern lobe,
which passed down part of Minnesota Valley into central Iowa.”

“In its recession, we suppose that it had periods of halting
and possibly advancing for shorts distances, which has, as before
explained, resulted in the accumulation of moraines. Between
the Red River lobe, as we may call it, and the Lake Superior
lobe, which occupied the upper Mississippi region, there was at
one time no distinct separation upon the surface of the ice sheet,
but as they melted away their margins would very naturally be
more and more separated along the height of land or ridge form­
ning the divide between the Mississippi basin and that of the Red
River.”

While it is probably irrelevant for this report to delve further
into the geologic history of the area as reported by Todd, Upham
and others, yet Todd’s description of the origin of the Wild Rice
moraine in Norman County, the Hill River moraine extending into
Chester Township, Polk County, and deltas formed by the Sand
Hill and Buffalo rivers, are items of interest to the geologist.

In tracing the shore lines or beaches of glacial Lake Agassiz,
Upham found that the elevation of the highest crest of the Herman
beach in Polk County was 1,173 feet above sea level, which would
indicate that water to a depth of 300 feet stood over what is now
Crookston, and that area from Mallory west was covered with
more than 300 feet of water. The most comprehensive report of
the beaches of Lake Agassiz in Minnesota and North Dakota is
given by Warren Upham Monograph XXV, U. S. Geological Sur­
vey, 1895. For the purposes of this historical review, quotations
and summarizations from Upham’s report in the 1916 History and
Biography of Polk County will suffice. Upham states:

“Several successive levels of Lake Agassiz are recorded by
distinct and approximately parallel beaches of sand and gravel
due to the gradual lowering of the outlet by the erosion of the
channel at Brown’s Valley and these are named in their descend­
ing order, Herman, Norcross, Tintah, Campbell and McCauliville
beaches, because they pass through or near these towns.”

Summarizing briefly Warren Upham’s descriptions of the vari­
ous beaches we note the following: Herman, the highest beach,
with elevations of 1,178 to 1,185 feet, crossed the south line of
the county in Garfield Township near its midpoint; thence north
to a point west of Maple Lake, then east northeast to the south side of Red and Rainy lakes. There appears to be three levels of Herman beaches passing through Godfrey and southeast part of Tilden townships where they curve to the end of Maple Lake to Mentor and Erskine, onward northeast and east to Trail and Gully.

The Norcross beach, at an elevation of 1,092 feet, is evident about three and three-fourths miles east of Benoit. About two and one-half miles east of Benoit three small ridges, at an elevation of 1,062 to 1,069 feet, can be noted which represent the Tintah beach. The Campbell beach crosses Polk County, beginning in Section 34, Liberty Township, at an elevation of 1,010 feet. It runs due north through Liberty, Onstad and the southern two-thirds of Kertsonville. The Campbell shore line is almost continuously a terrace of ten to thirty feet in as many rods (commonly known as the Sand Ridge). Numerous boulders, remaining from the wave erosion, are strewn on a narrow belt below the terrace. The Campbell beach takes a north, northeast course from Section 9 in Kertsonville to the southwest corner of Red Lake Falls Township.

The McCauleyville beach lies a few miles to the west of the Campbell beach and runs parallel to it. Other low, less defined beaches are, according to Todd's map of Polk County, the Ojatta and Gladstone. The former beach enters the county some seven miles east of Neilsville and extends north through Scandia, Hammond, and over eastern Lowell and Fanny north to some two miles west of Euclid, northward crossing the Great Northern tracks some two and one-half miles north, paralleling the tracks one to two miles east until it crosses the Marshall County line. The other less defined beach starts in the vicinity of Tabor and extends due north to the north boundary of the county. This last named beach is referred to as the last stage of Lake Agassiz.

1895 Northwest Experiment Station established at Crookston.
1895 Big floods on the Red and Red Lake Rivers.
1900 Present Court House dedicated.
1906 Northwest School of Agriculture established in connection with the Northwest Experiment Station.
1908-'09-'10 Some grasshopper damage from local species not Migratory locusts.
1910 Bad fall forest fires, Warroad, Beaudette and Spooner areas.
1918 October, Bad grass and brush fires in Polk County. Terrific forest fires, Deer River, Carlton and Duluth areas; loss of many lives.