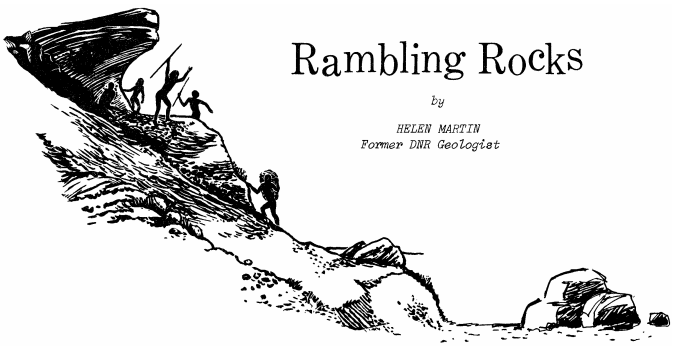

Rambling Rocks

by

HELEN MARTIN, Geologist

Every school child knows about Plymouth Rock, the granite boulder the Pilgrims made famous. Not so well known but more important in its place in our modern way of living, is Michigan's famous Ontonagon Boulder that now rests in the Smithsonian institution, for it once lured the Indian, French, British and finally Americans to Michigan's famous Copper Country. Many know the huge pile of granite rocks in Jackson that marks the spot "under the oaks" where, years ago, the Republican party was born. Many other oddly interesting boulders are monuments along our highways, or tombstones in cemeteries, rocks in gardens, stones for fireplaces or chimneys or other structures, and some are just plain nuisances in farmers' fields.

But what tales of travel these boulders could tell! Some of them are a hundred miles from home--some a thousand miles away. Some were plucked from the old Laurentian highland north of Quebec by the ten to forty-thousand-foot thick continental glacier of the last Ice Age, then carried and rolled as far south as Kentucky and as far west as Iowa. Some clawed their way along at the bottom of the ice, scratching and grooving the bedrock, and leaving trails from whence they came, also marking the route the glacier traveled. Many are scattered all over Michigan, for the old glacier-trains that carried them were not at all particular about their destination.

Many other tales they could tell, too. Some of the granites are the oldest things on earth. They could tell of being cooled and crystallized from a molten mass when the earth was very young and the continents were shaping. They were of the froth that rose as the heavier masses sank and formed the ocean basins. In them, we find garnets and mica and veins of rare minerals. Some could tell tales of an early ice age long before any of the animals came and only primitive plants were on the earth. Some sparkle with the story of iron ore forming. Others are fragments of ancient beaches, compressed, then cemented and solidified into rock. Still others are relics of old lava flows. The Ontonagon Boulder was a 6,000-pound mass of copper that once filled a gas bubble hole left in the lava. Younger boulders hold the story of corals, clams and snails, dead for millions of years. All tell a story of the past--fragments of the many chapters in the earth's history.

On the shore of Lake Huron, near Rogers City, a great limestone boulder dropped off there centuries before Lake Huron ever was, became a Manitou for the Indians. Here they placed offerings of tobacco, pelts and other treasures before they crossed the Straits. Near the entrance of Wilderness State Park, and at Big Rock Point in Charlevoix County, are other huge limestone boulders many feet in circumference. All were carted in by the ice from what is now the southern part of the northern peninsula. The Rogers City and the Charlevoix boulders were washed clean by the waves, but the Wilderness boulder is being changed to soil by the lichens, mosses and other small plants. Even trees are growing on it.

Some boulders seem to be made of hundreds of little stones--red, black, white--cemented together. They are "pudding stones" or conglomerates, and before they were cemented to very hard rock, they were the pebbly part of a beach near where Georgian Bay of Lake Huron is now. Over the world they are known as the Georgian Bay conglomerates. All the stones are quartz--the red and black ones, jasper.

As one goes lake or seaward from a modern shore, the sands become finer and finer. Just so they were on the ancient shores. In time, the fine sands carried far from the pebbled shore were also cemented together. Later by the work of heat and pressure, they became glassy white rock--quartzite, which the glacier plucked and carted southward.

A class memorial on the University of Michigan campus, several boulders marking the old trail in Vermontville, many of the huge stones in the State park building at Utica, stones of a filling station on Highway US-131, are jasper conglomerates. In fact, so many of these "pudding stones" are scattered over Michigan that there are some who think they are typical Michigan stones, but they were glacier-freighted down from Canada.

Over the fireplace mantle in the shelter at Dodge Brothers No. 8 State Park in Utica is a silvery boulder made up of overlapping silvery scales---another old rock of the iron formations--specular hematite.

Once huge slabs of limestone six to twenty feet long were scattered throughout southern Michigan. They were plucked from Ontario limestone and pushed in from the east by the glacier. They were used for building and for lime burning by early settlers. They were so big they puzzled early geologists who didn't know about glaciation. They thought they were ledges of limestone in place, or float rocks that a flood had rafted in.

Near Hudson, in Lenawee County, a huge monolithic boulder eight or more feet high marks the Will Carleton School--and who now remembers that Michigan once had a famed poet named Will Carleton? A similar gray granite boulder on Highway US-27 marks the place of the first schoolhouse in Isabella County. On a high hill overlooking Black Lake, Cheboygan County, a dark gray granite boulder marks the final resting place of Superintendent Daniel Greene in the forest he loved and served so well. Unusual boulders ornament a little park overlooking the Grand River at Green's Point in Ionia County--a memorial to former

Governor Green. There are others, too--the Rendezvous Chimney in Gaylord, the curious wind-etched ribbed boulders, the rocks of the "Viking Cross", fences and rock gardens, those once used as hitching posts, and those cobbles and boulders used in making stream improvements.

As the Ice Age glaciers slowly crept down from Labrador and Hudson Bay, the cold and the changes of temperature cracked up the underlying rocks. Streams from the summer melting of the advancing glaciers washed them clean. The glaciers froze onto rocks large and small and carted them southward. They picked up granitic rocks filled with garnets, mica and jasper. They froze onto limestone, sandstone, shale. They plucked off granites, lavas with their agates and carnelians, iron-bearing rocks, even a few diamonds and gold-bearing quartz. They jumbled all these old rocks with younger rocks which they plucked off the petrified cemeteries of corals, moss animals, shelled creatures that had helped to build up the limestones, and they smoothed and polished when they couldn't rob any more. They shoveled up sandstones and shale and fragments of old petrified sea floors and beaches. That's why you can find almost any kind of rock in a gravel pit. In the mill of the glacier, the rocks were ground to sand and gravel, cobbles and boulders with rounded edges.

The ice along the front of the glaciers melted, rapidly at times, and made torrential rivers that washed the gravel from the ice, and sorted and scoured and polished it, and, when the torrents ceased, dumped it in thick deposits and banks scattered over the land where the glacier had been. The cracks and gouges in the bedrock were filled with sand and gravel. Here too was trapped some of the meltwater from the ice. Other rivers carried the glacial gravels far south of the glaciers' halting places. Lakes formed in front of the glaciers and, in them, rivers dumped deltas of gravel. On their shores, great beach ridges of sand and gravel were built by wind and waves--beaches that became man's highways when he walked or rode a horse westward to new lands.

When the glaciers were not moving, the meltwater fell as waterfalls and cascades into the cracks of the glaciers, and they carried, sorted and washed gravel into the cracks, piling it up layer on layer. Rivers formed in the ice, carving tunnels for their flow--tunnels that became choked with sorted sand and gravel that the ice bound streams washed from the ice. When the last of the ice melted away, conical hills (kames) of sorted gravel were left where the ice cracks and waterfalls had been. The gravel choking the old stream tunnels was let down in long sinuous ridges (eskers) of sorted gravel. The early settlers called these long rounded ridges hogsbacks or Indian Trails. Stream channels that pushed their heads northward also became filled with gravel. Where the glaciers readvanced, all the earlier gravel deposits were buried under the water glacial deposits.

All these vast deposits of sand and gravel of the glacial drift that covered the bedrock became filled with water from the melting ice and then the rains of the centuries that followed the disappearance of the glaciers. Thus were made some of Michigan's aquifers-- the great buried reservoirs of water.

Some of this gravel is now in pockets and banks at the surface, covered only with thin vegetation, and on this common stuff a basic industry has been developed. Our early "good roads" were gravel and crushed stone made of the large cobbles. Then along came Portland cement to mix the old glacial gravels with cement to make our modern concrete. And so, good hard roads demanded by the newly arrived automobile, became possible. Dams, culverts, bridges and construction of all sorts called for more concrete, more sand, more gravel.

Power shovels took off the overburden of soil and vegetation nature had so carefully built over the gravel deposits. Larger power shovels bit into the largess of the glacier. Conveyor belts, crushers and screens were erected. Great piles of gravel, washed free from sand and sorted to size, were heaped up. Busy trucks hauled away the sorted gravel to build roads, dams, culverts and bridges. A gravel pit was made.

All too soon the edges of the deposit were reached. Too soon the ground water became a problem and the shovels could go no deeper when the bottom of the deposit was reached. Only the best of the gravel was taken. The less-washed, less-sorted gravel around the edges of the pit was left to be used some other day when the sand and gravel industry needs the wastes and has to rework the edges of the old pits. The shovels and crushers and conveyor belts moved away, the trucks started to haul from elsewhere and only an ugly scar was left on the landscape--a scar that for a time in its deeper parts holds water for a swimmin' hole.

But nature does not like scars, even for swimmin' holes. She makes the winds blow, and the birds carry seeds to the scar--seeds that can find food in the water solutions in the gravel -- grasses, roses, shrubs on the higher banks; cattails, reeds, water-loving plants where the scar is deepest and water stands. In a few years, the steel cables, discarded shovels, barrows and junk of the abandoned pit are covered. Steeper slopes slump to gentle inclines. Oaks and cherries move in. In time, even the cattail marsh disappears. Nature has won out by restoring the green face of the earth to the man-made scene of desolation.

Perhaps the old pit was made into a safe swimming hole within a park or playground. Perhaps another was filled in to become a building site, or a baseball diamond. Or mayhap, someone builds a home amid the tall trees on the high banks of the old forgotten gravel pit, clears out some of the young oak and shrubs, builds a garden on the slope and a picture window that looks out over a lily pool, where once the cattail marsh covered the scar made when man dug out and used the Ice Age gravel for his modern needs. Indeed what tales lie hidden in our Rambling Rocks.

Reprinted with permission of the editor.
the 'Conglomerate' is the newsletter of the Michigan Mineralogical Society