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The Sleeping Giant **The Story of the Mt. Morris Dam**

by Ruth Rosenberg-Naparsteck





Workmen prepare to blast out stone in preparation for anchoring the dam to the gorge wall. (Army Corps of Engineers)

Front Cover: The Sleeping Giant-the Mt. Morris Dam-stands 215 feet above the floor of the Genesee River blocking its passage and controlling its flow during high water; but most often allowing 'run of the river.' (Army Corps of Engineers)

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Runnin' Crazy

Residents of the Genesee River Valley had become used to working with the river and its seasons of usefulness. Many people had lived along the banks of the river for over a half century and felt they knew the river well. There had been serious floods in 1785, 1817, 1818, 1835 and 1841 and periodic spells of drought that shut the mills down and threatened the operation of the Erie and Genesee Valley canals. But Rochester had made improvements to protect the mills and businesses along the river's banks from floods. The river was under control. The City's Health Officer Lyman B. Langworthy wasn't as confident about that as many City Officials. He placed a note in the cornerstone of the new second Monroe County Court House in 1850 predicting that the Genesee would rebel against the narrow channel it had been confined to by the construction of mills and retaining walls tight to its banks. His caution went little noticed until 1865.

On St. Patrick's Day, March 17, 1865 telegraphs arrived in Rochester warning that high water in the upper Genesee would soon reach the City. The warnings were casually dismissed. There was no downpour or any reason to think that this year the Spring behavior of the river would be different. But it was. Upriver a heavy Spring snowfall had been suddenly thawed by warm rains that gathered strength from the springs and rushed northward with alarming volume and velocity. At mid-afternoon



Stone is removed from the gorge wall while building the south abutment of the Mt. Morris Dam. (Army Corps of Engineers)

there was nothing about the river in Rochester to catch the attention of passers-by; but by dark driftwood and other debris carried from upriver blocked bridges and the eastside arches of the Erie Canal aqueduct (now the Broad Street bridge).

Child's Basin on the west side of the aqueduct overflowed into Exchange, Aqueduct and Buffalo (West Main Street) Streets. Mungie's Basin overflowed into Plymouth Avenue deepening the flood waters on Buffalo Street. On the east side of the river south of the Genesee Valley Railroad bridge, the water overflowed into the canal feeder then into the Erie Canal. The water crossed west over the north-flowing river, but by late evening the aqueduct was so flooded the water was carried northward by the swift current of the river.



During the flood of 1865, Main Street was flooded and many of the businesses built out onto the bridge were destroyed. In this photograph, the water has receded nearly back to the river's banks. The city's Health Officer, Lyman Langworthy predicted that the buildings built tight to the river's bank, confining it in too narrow a passage, would someday bring flooding. (Rochester Public Library)

The Genesee climbed an inch an hour until late Saturday night when it finally crested. More than half of the Main Street bridge was under water before the river pushed around the buildings on the west side through Buffalo and Front streets. The Genesee shouldered logs like battering rams that broke through the south walls of the buildings on the Main Street bridge and exited the north walls.

When the river calmed, men paddled through the streets in small boats salvaging what they could from their properties. Though the river had crested, the current was too swift to paddle on State and Front streets. Teams of horses struggled through the debris pulling wagons through less flooded streets. For three days the City was cut off from communication as the telegraph poles were knocked down, roads and bridges and the railroad tracks were submerged and damaged. Gas was shut off to the City's street lights, hindering clean-up and reducing public safety.

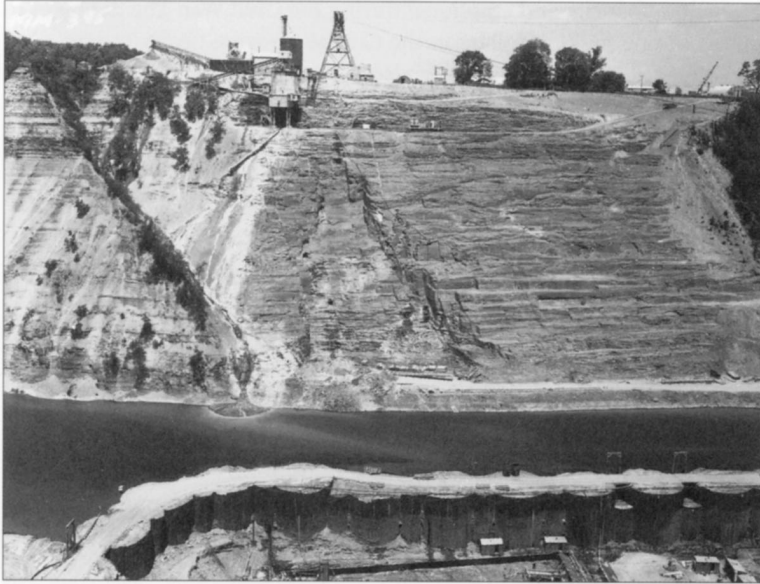
Mayor Daniel D. T. Moore requested from the U.S. Army that the men of Rochester be released from military duty to assist in the flood recovery, but the request was denied. The people had already suffered great hardship, financial and emotional during the Civil War. The damages in excess of one million dollars in the City alone were nearly overwhelming. Villages and towns upriver also reported heavy damages to croplands and buildings and bridges. Langworthy's prediction was realized, though it went unnoted. The river was not under control. People did not really know its behavior at all. They had just become comfortable with what they thought were familiar patterns of nature.



In its 10,000 years the Genesee River carved out its own confines between the gorge walls midway along its path from the hills of the Allegheny Mountains in Pennsylvania to the mouth of Lake Ontario. The Genesee River is the only river to bisect New York State. (Army Corps of Engineers)

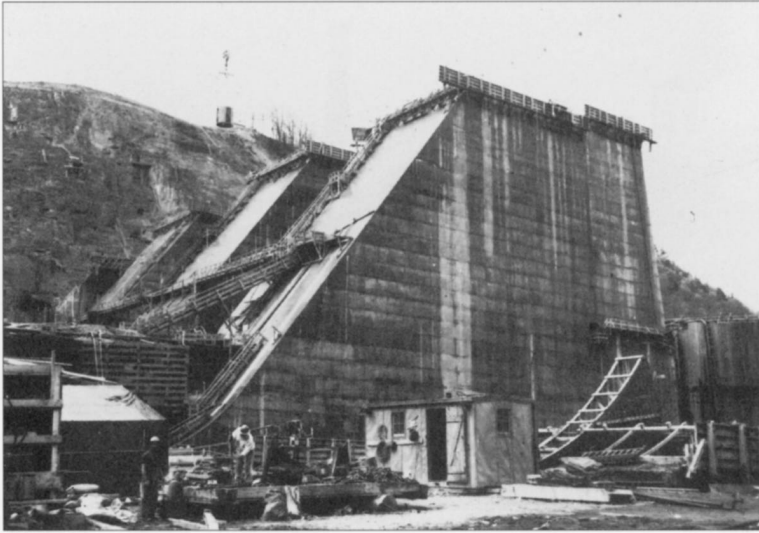
The Struggle For Control

General I. F. Quinby headed a commission to study the flood conditions of the river. It was recommended that retaining walls be built, ice breakers be put on the aqueduct and Main Street bridge, flood gates be built on the Johnson and Seymour Dam, removal of the ruins of the first Erie Canal aqueduct and the excavation and clearing of the river's bed. A City Council committee had made the further recommendations that the Main Street bridge be replaced with one that would pass more water underneath it and that a ten square yard tunnel carry flood waters through the downtown from Front Street to the High Falls.



The stone was quarried in LeRoy and trucked to the dam site where it was crushed, sized and pulverized to make sand and gravel for concrete. Many materials could be had locally. There was enough concrete used in the construction of the dam to build a two lane highway 300 miles long. (Army Corps of Engineers)

Ten years after the devastating flood of 1865, an ice jam at Clarissa Street bridge backed up water through much of Rochester causing extensive damage. Floods upriver frequently damaged early crops or delayed planting; but Rochester was seldom affected. In March of 1902, however, another major flood occurred. Little had been done since the studies of the flood of 1865. Another study was launched to document the entire river and its tributaries. This first comprehensive study of the entire watershed helped officials to understand the river and to predict its behavior. This new study recommended reservoirs at Portageville, but short of funds for this project the City built retaining walls, a storm



The blocks, though half completed, dwarf the workmen to the left in this photograph. Note the bucket of concrete crossing the gorge to the left of center. (Army Corps of Engineers)



Cofferdams were built to provide dry work areas. A string of lights stretched across the gorge is visible to the left. The forms built to shape the concrete as it was poured are seen here. (Army Corps of Engineers)



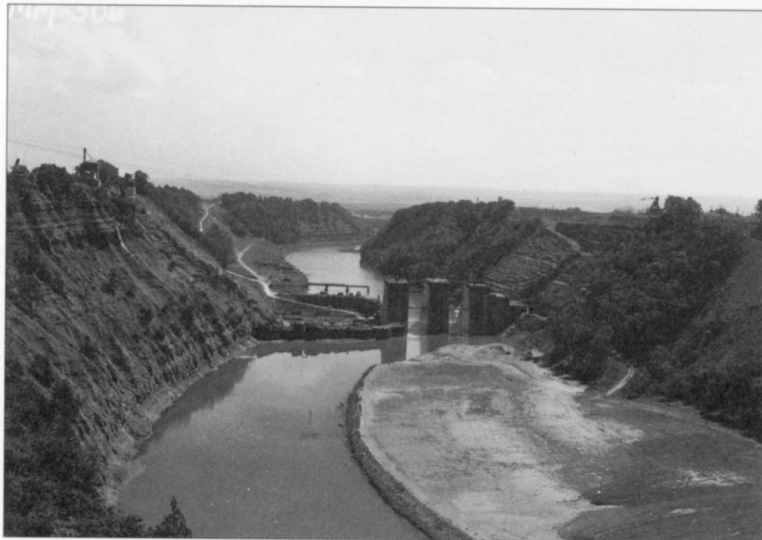
The Andrews Street Bridge was overrun by the racing waters of the Genesee during the flood of 1862, flowing through the river and into the city's streets. (Rochester Public Library)



365. That was the worst flood in the city's history. 54,000 cubic feet per second (cfs) of water flowed

sewer, placed rip-rap along the banks, raised the Erie Railroad tracks and straightened the river's meandering channel. People were fast losing patience with the perennial discussions of flooding.

The Genesee River was capable of carrying 40,000 cubic feet per second (cfs) of water through the narrow channel left for it between the mills and buildings in downtown Rochester. The flood of 1865 had brought an estimated 54,000 cfs rushing through the City so that it spilled 14,000 cfs over its banks. The proposed reservoir at Portage could retain water and let it out gradually.



The trees and growth along the flats of the river have been removed and several monoliths or blocks, have been built for the Mt. Morris Dam. The dam took four years to complete working day and night through every season. (Army Corps of Engineers)

The Genesee is young for an American river—only 10,000 years old. Though it was youthful, like all flowing water, it followed the line of least resistance which made it one of the few rivers in America to flow north rather than south, seeking its lower level at Lake Ontario. In its rigorous journey it cut deeply into the rock leaving deep gorges and tearing out acres of fertile soil from the Valley as it moved swiftly around its many bends.

In the first three decades of the 1900s two river deepening projects increased the river's capacity to carry water through the City. As if in protest, in 1916 the Genesee broke through a cofferdam flooding machinery used to cut the river's floor. The 97-foot High Falls was reduced to 81 feet with scarcely a notice from the public that complained loudly in 1854 about the quarrying of stone from the brink of the Falls that they had

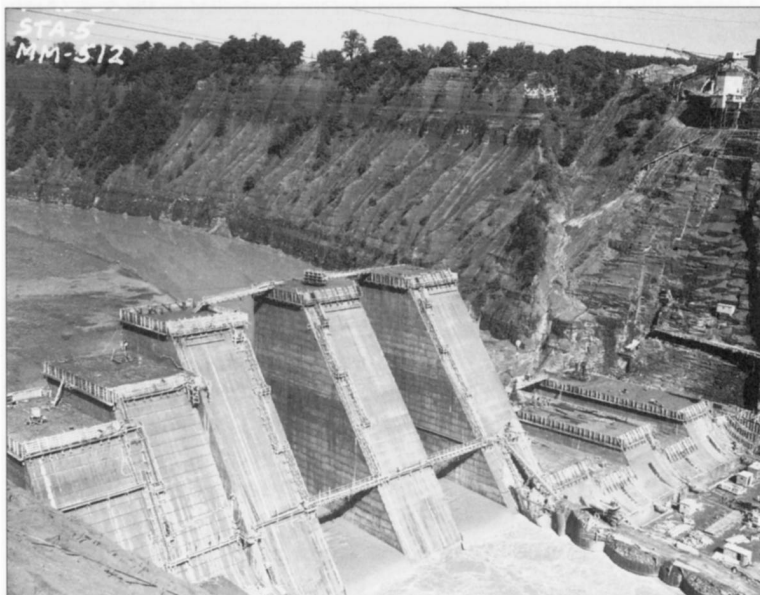
come to claim as a public view.

The river deepening project increased the capacity of the river to carry 90,000 cfs through the downtown—46,000 cfs more than the worst recorded flood in the city's history in 1865. It seemed finally that the river had been brought under control. *Democrat & Chronicle* reporter Emmet N. O'Brien wrote in the Spring of 1936 that the river was carrying 21,000 cfs with little protest. He wrote; "In comparison, the Genesee rolled between walls of stone and masonry in Rochester, tossing up a few belligerent white caps, emitting some dull rumbles, but acting surly only in the realization that it had been stripped of its strength by the ingenuity of man.

Brick by brick the city is building adequate retaining walls. Blast by blast it is removing rock from the river bed. Dam by dam it is bringing the year-around flow of the stream under control of the hand."

The Sleeping Giant

For nearly a century engineers studied the river, eventually expanding beyond Rochester to include the entire Genesee Valley watershed. The severity of floods was somewhat lessened, it was learned, by the glacial carving of the Valley's varied terrain. If the river was cut through steep hills as the Allegheny River was through Johnstown and Pittsburgh, the



Half of the monoliths, or blocks, were left lower to allow the river to pass over during construction. Every other block was left open until near completion. The blocks are built independently so that if any one of them fails, the others will hold back much of the water. (Army Corps of Engineers)



The conduits allowed the river to flow freely even before the dam was completed. A flood in 1950 before the dam was completed was controlled by the dam. (Army Corps of Engineers)

melting snow and sudden rains would swell the Valley; especially since logging had stripped the hills of the ability to absorb and slow the water. Instead the Genesee rushed through the gorge midway along its course and fanned out on the river flats, slowing its pace before it reached Rochester. Over its 10,000 year life the Genesee had unknowingly carved out its own containment—the gorge walls midway along its course at what is now Letchworth Park.

The Army Corps of Engineers had recommended future development of the river for multi-purpose use. The potential energy in water power was great. Rochester Gas & Electric Corp. purchased land along the river around Mt. Morris between 1923 and 1926; but because the park land around Portageville donated by William Pryor Letchworth prohibited power development, the permit to develop power was denied. Farther north at Mt. Morris, Rochester Gas & Electric Corp generates electricity on the power of the Genesee.

In 1944 Congress authorized the construction of the Mt. Morris Reservoir, a flood control dam to be located forty miles south of Rochester. The river wound through the Genesee River Valley 67 miles before letting out at Lake Ontario. The Army Corps of Engineers had recommended an earthen dam about 1,500 feet north of the present dam site with a storage capacity of three inches of run-off. Another proposal was a multi-purpose dam at Portageville to store an additional nine inches of

run-off.

In September of 1945 the Chief of Army Corps of Engineers recommended a concrete gravity dam able to hold 5.86 inches of run-off. Construction began in March of 1948 and was completed in December of 1951. When Gannett reporter Ham Allen saw the beginning of construction of the Mt. Morris Dam in 1948, he seemed to be reemphasizing the control Emmett O'Brien thought man had over the Genesee in 1936. Allen wrote: "Man's struggle to harness nature is a raw, bare-knuckle fight against the elements... Nowhere is this more evident than in the Mt. Morris Dam... notched into the time-etched highlands of the Genesee River, the dam is expected to halt forever the ravages of flood from the Genesee Country..."

The Mt. Morris Dam was built to control 2,476 square miles of watershed. The Genesee begins in the Pennsylvania hills of the Allegheny Mountains at an aquifer that also spawns the Allegheny and the Susquehanna rivers, creating a triple divide. The altitude at the origin of the Genesee is 2,500 feet above sea level. Half of the watershed, 1,077 square miles in drainage area, would spill 18 billion gallons of water into the river.

Five contractors joined together to form the Mt. Morris Dam Builders in 1948. The site of the dam was seventeen miles downriver from the Lower Falls of Letchworth State Park at the Genesee High Banks. The concrete gravity dam was 1,026 feet long, 221 feet thick at the base, 246 feet high with training walls to protect the banks from erosion and a downstream stilling basin to calm the water as it exited the dam.

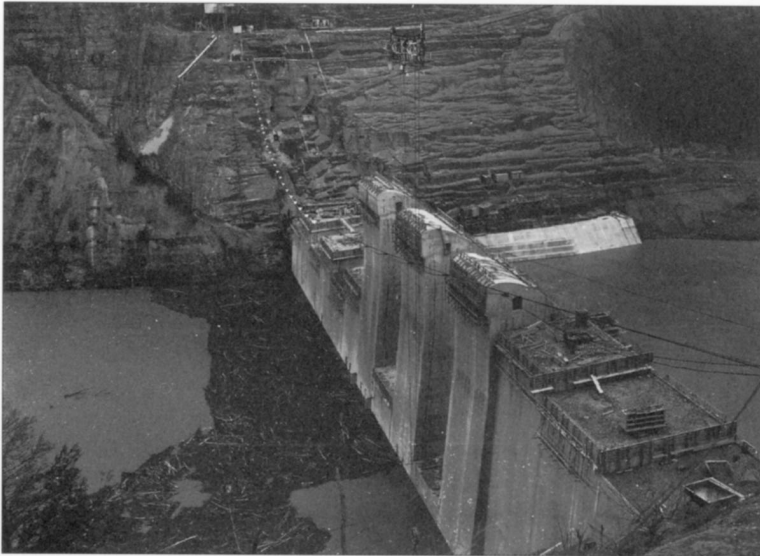
The work was dangerous. Men scaled the gorge walls, climbed wooden ladders anchored to the walls, set off blasting powder to cut deep caverns into the gorge walls. A 110-foot headtower was built on the north bank of the wall and two 45-foot tailtowers were set on the south bank connected by tracks that made the entire work area reachable by cable. Cableways carriages crossed on three inch coil cables between the towers. The cableways spanned 1,710 feet across the gorge.

Twenty-two tons of concrete were carried in eight cubic yard buckets which swung in the air carrying concrete from one side of the gorge to the other. Every five minutes night and day for three years from May through November 1949 to 1951 these twenty-two ton loads of concrete were poured into the forms.

Four hundred and seventy men worked on the Mt. Morris Dam during the four years of construction. Trees were cut and burned from the river flats to reduce the amount of debris the river would carry downstream. The gorge walls were blasted and cut away to carve out the keyway. A cofferdam was built to force the river to one side creating a dry area for the workers. The cofferdam was built of cells of interlocking steel sheets formed around templates and driven into the rock floor of the

river. The cells were filled with soil to weigh them and keep them in place.

The concrete and gravel was quarried in LeRoy twenty-six miles from the dam site and trucked to an on-site storage area. The stone was dumped into a hopper, crushed and screened repeatedly and sized. Small stones were pulverized to make sand. The stone and sand were conveyed to a concrete mixer that dumped two 22-ton batches of concrete into buckets set on the tracks that led from one tailtower to another. The buckets were connected to the cable and carried across the gorge to hover directly over the forms of the dam below. Every 22-ton batch of concrete raised the level of the forms five feet.



When the river was dry, the workmen could work quickly. Any debris that accumulated could be removed. (Army Corps of Engineers)

Wood forms created passageways, rooms and steps. Steel rods reinforced the passageways and chambers near the operating gates. A stilling basin five feet thick extended 240 feet north of the dam to calm the water as it flowed from the dam. A training wall protected the river bank and dam.

Though development of electricity was not permitted, two 19-foot diameter tube openings were built into the dam to permit future development. Forms for conduits were built to allow the river passage. Every other block was left down to allow passage of the water while the workmen moved to build a cofferdam on the other side of the river.

The workmen were in a race against time - sometimes against the bit-

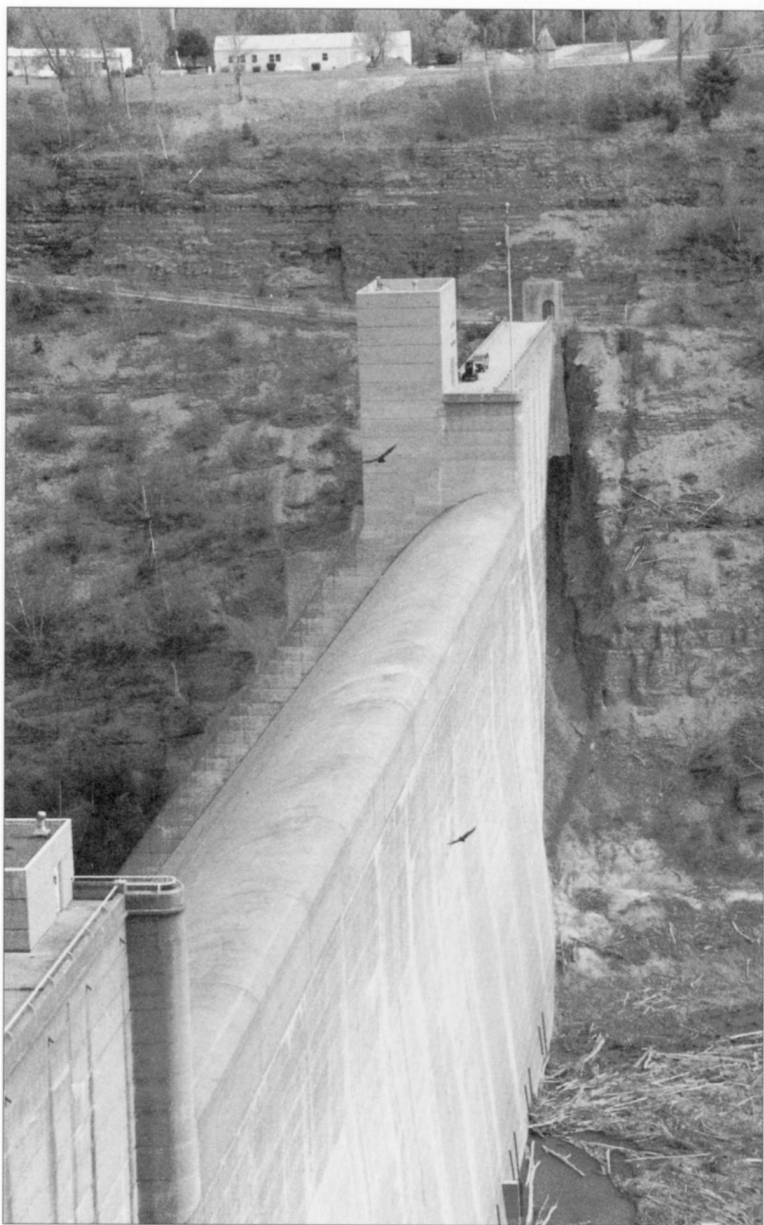
ter cold and driving winds of winter and sometimes against the flooding of spring waters. Workers sometimes pumped out millions of gallons from the area supposed to be protected by the cofferdam. The dam was half completed when it stretched across its nine conduits. As the blocks were raised to 246 feet the river began to back up. In October of 1951, the dam was completed.

Even before completion, in November of 1950, Mt. Morris operated as a flood control dam to slow the flow of the Genesee, but Wellsville and Portageville were flooded. By March of 1956 warm rain and melting snow combined to be what could have been a serious flood. If the Army Corps of Engineers had not controlled the flow of the river, Rochester could have expected an estimated 48,300 cfs compared to the 24,300 it actually experienced. In comparison the devastating flood of 1865 was 54,000 cfs.

In 1972 Hurricane Agnes caused a storm front to stall over the Genesee River Basin dropping 13.72 inches of rain near Wellsville between 9 pm June 20 and 6 am June 23. The Army Corps of Engineers estimated 16 inches of rainfall in the upper Dykes Creek area. The average rainfall in the Genesee River Basin was 7.1 inches; Because 10.2 inches fell above the Mt. Morris Dam, the water behind the dam reached 755.8 feet above sea level—96% of its capacity. Dam operators struggled to keep debris from spilling over the top of the dam by letting water out with carefully controlled flow. For the past half century, the Sleeping Giant, the Mt. Morris Dam, has stood like a solid, immovable barrier to the raging Genesee River. Despite the words of Emmett O'Brien and Ham Allen, the youthful Genesee River demonstrated its strength and that man is not yet in control.



The trees are removed from the flats and the river is the same height on both sides of the partially completed dam indicating that the river is running freely. Flood waters can be held back over a seventeen mile length from Mt. Morris to the Lower Falls at Letchworth State Park. (Army Corps of Engineers)



Red-tailed hawks soar above the Mt. Morris Dam in the Spring of 1994. Logs and other debris carried downstream by the river threaten to damage the bridges north of the dam. When the logs block the flow of the river under the bridges, flooding results. When the river bed is dry, workmen burn off or remove the logs to prevent them from passing over the top during high water. (Edward P. Curtis, Jr.)