

Johnstown Flood

National Memorial
Pennsylvania
U.S. Department of the Interior



Market Street area of Johnstown before the flood. Iron mills and worker housing are in the background.



The wave reduced the area to rubble in 10 minutes. Some buildings were spared where the wave split.

“A Roar Like Thunder”

On June 1, 1889, Americans woke to the news that Johnstown, Pennsylvania had been devastated by the worst flood in the Nation’s history. Over 2,200 were dead, with many more homeless. When the full story of the flood came to light, many believed that if this was a “natural” disaster, then surely man was an accomplice.

Johnstown in 1889 was a steel company town of Germans and Welsh. With a population of 30,000, it was a growing and industrious community known for the quality of its steel. Founded in 1794, Johnstown began to prosper with the building of the Pennsylvania Mainline Canal in 1834 and the arrival of the Pennsylvania Railroad and the Cambria Iron Company in the 1850’s.

There was one small drawback to living in the city. Johnstown had been built on a floodplain at the fork of the Little Conemaugh and Stony Creek rivers. Because the growing city had increased the runoff from the surrounding hills by stripping them for wood, and had narrowed the river banks to gain building space, the heavy annual rains had caused increased flooding in recent years.

There was one other thing. Fourteen miles up the Little Conemaugh, 2-mile-long Lake Conemaugh was held on the side of a mountain—450 feet higher than Johnstown—by the old South Fork Dam. It had been poorly maintained, and every spring there was talk that the dam might not hold. But it always had, and the supposed threat became something of a standing joke around town.

But at 4:07 on the chilly, wet afternoon of May 31, the inhabitants heard a low rumble that grew to a “roar like thunder.” Some knew immediately what had happened: after a night of heavy rains, the South Fork Dam had finally broken, sending 20 million tons of water crashing down the narrow valley. Most never saw anything until the 36-foot wall of water, already boiling with huge chunks of debris, rolled over them at 40 miles per hour, consuming everything in its path. Those who did see it said it “snapped off trees like pipestems,” “crushed houses like eggshells,” and “threw around locomotives like so much chaff.” A violent wind preceded it, blowing down small buildings. Making the wave even more terrifying was the black pall of smoke and steam that hung over it—the “death mist” remembered by survivors.

Thousands of people desperately tried to escape the wave, but they were slowed as in a nightmare by the 2 to 7 feet of water already covering parts of town. One observer from a hill above the town said the streets “grew black with people running for their lives.” Some remembered reaching the hills and pulling themselves out of the flood path seconds before it overtook them. Those caught by the wave found themselves swept up in a torrent of oily, yellow-brown water, surrounded by tons of grinding debris, which crushed some, provided rafts for others. Many became helplessly entangled in miles of barbed wire from a destroyed wire works. People inside when the wave struck raced upstairs seconds ahead of the rising water, which reached the third story in many buildings. Some never had a chance, as

homes were immediately crushed or ripped from foundations and added to the churning rubble, ending up hundreds of yards away. Everywhere people were hanging from rafters or clinging to rooftops and railcars being swept downstream, frantically trying to keep their balance as their rafts pitched in the flood.

It was over in 10 minutes, but for some the worst was still to come. Thousands of people, huddled in attics or on the roofs of buildings that had withstood the initial wave, were still threatened by the 20-foot current tearing at the buildings and jamming tons of debris against them. In the growing darkness, they watched other buildings being pulled down, not knowing if theirs would last the night. But the most harrowing experience for hundreds came at the old stone railroad bridge below the junction of the rivers. There, thousands of tons of debris scraped from the valley, along with a good part of Johnstown, piled up against the arches. The 45-acre mass held buildings, machinery, hundreds of freight cars, 50 miles of track, bridge sections, boilers, telephone poles, trees, animals, and 500 to 600 humans. The oil-soaked jam was immovable, held against the bridge by the powerful current and bound tight by the barbed wire.

Those who were able began scrambling over the heap toward shore. But many were trapped in the wreckage, some still hopelessly hung up in the barbed wire, unable to move. Then the oil caught fire. As rescuers worked in the dark to free people, the flames spread over the whole mass, burning with “all the fury of

hell,” according to a Johnstown newspaper account. Eighty people died at the bridge, some still in their own homes.

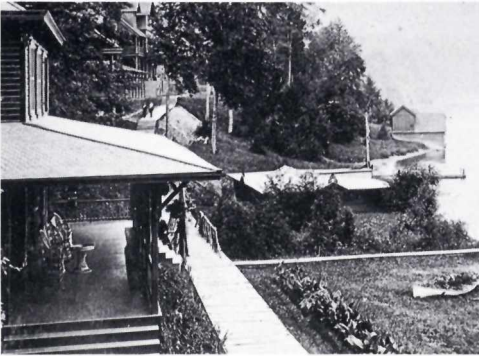
The next morning survivors were unsettled by the eerie silence hanging over the city. During the night the waters had receded, revealing vast heaps of mud and rubble filling streets—where there were still streets—up to the third story. Entire blocks of buildings had been razed. Hundreds, alive and dead, were buried beneath the ravaged city.

Many bodies were never identified, and hundreds of the missing were never found. As everyone had dreaded, disease followed in the wake of the flood, and typhoid added 40 more lives to the 2,209 that died in the flood. Emergency morgues and hospitals were set up, and commissaries distributed food and clothing. The Nation responded to the disaster with a spontaneous outpouring of time, money, food, and clothing. Contributions from the United States and abroad totaled over \$3,700,000.

Property damage was \$17 million. The cleanup operation took years, with bodies still being found months—and in a few cases, years—after the flood. The city regained the population it lost and rebuilt its manufacturing centers, but it was 5 years before Johnstown fully recovered.

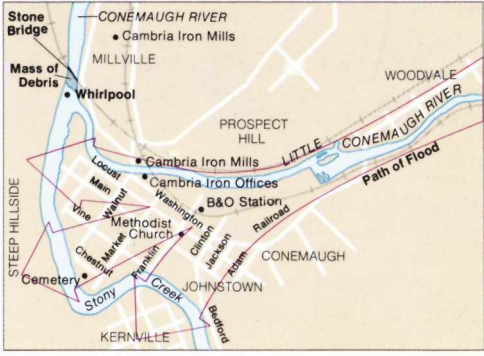
Retreat for the Rich

The South Fork Fishing and Hunting Club was an exclusive and somewhat secretive retreat for the Pittsburgh rich. They bought an abandoned reservoir, then repaired the old dam, raised the lake level, and built a clubhouse and cottages. Members enjoyed hunting, sailing, and even two excursion steamers plying the lake. But their careless maintenance of the dam weakened it dangerously.



The Flood Paths

As the flood hit Johnstown, the wave split, part following the river channel, the rest moving through downtown. Large buildings split that part again, sending half roaring down Clinton and Jackson streets, and the rest directly through town. This central wave crashed into the sheer hillside at Stony Creek, causing a backwash up the river and a violent whirlpool above the stone bridge.



A Wild Ride

Victor Heiser, 16 at the time of the flood, later recalled: “The townspeople, like those who live in the shadow of Vesuvius, grew calloused to the possibility of danger.” He was in the family barn when the flood struck, and saw his home, with his parents in it, crushed and swept away. Clinging to the barn roof, he had a wild ride down the Conemaugh and then up the Stony Creek on the backwash, ending up in Kernville.



Aid from the Red Cross

Clara Barton, “Angel of the Battlefield,” and her staff of 50 doctors and nurses arrived in Johnstown 5 days after the flood. It was the first test of her newly formed American Red Cross. After surveying the injured she set up hospital tents, built six “Red Cross hotels” for the homeless, and distributed food, clothing, and medicine. Though 67, she worked tirelessly, remaining in Johnstown until October.



The Unknown Victims

A cemetery was built in 1892 for the graves of the 755 unknown victims of the flood. Other tragic statistics: 99 families were wiped out; 98 children lost both parents. After the flood, Major John Wesley Powell wrote: “Modern industries are handling the forces of nature on a stupendous scale...Woe to the people who trust those powers to the hands of fools.”



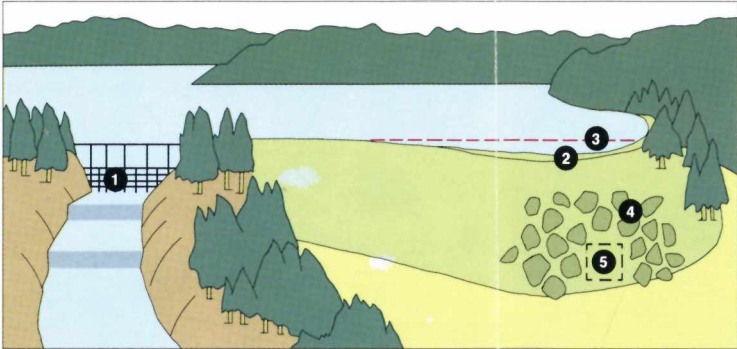
“Our Misery Is the Work of Man”

Why weren’t the people of Johnstown warned? They were—three times in the hours before the flood—but they had heard those warnings for years. The South Fork Dam, one of the largest earthen dams in the world, had always held before during high water. And wasn’t the dam being maintained by some of the richest and most powerful men in America?

The South Fork Fishing and Hunting Club, made up of Pittsburgh industrialists and businessmen like Andrew Carnegie and Andrew Mellon, had bought the lake and dam 10 years earlier as a summer retreat. The reservoir was originally built to supply water for the Pennsylvania Mainline Canal. The dam had been built according to accepted engineering practices of the time, but the canal system was obsolete as soon as the dam was completed in 1853, and the Pennsylvania Railroad bought it 4 years later. In 1862 a break occurred near the discharge pipes, but little damage resulted because the lake level was so low. The railroad abandoned the dam, and it deteriorated until 1879, when it was bought by the South Fork Club, which repaired the dam carelessly and without the advice of engineers.

At first the 72-foot-high dam frightened some residents. Said one: “No one could see the immense height to which that artificial dam had been built without fearing the tremendous power of the water behind it . . . People wondered and asked why the dam was not strengthened, as it certainly had become weak, but nothing was done, and by and by they talked less and less about it.” Others, realizing their continuing vulnerability, called the dam “the sword of Damocles hanging over Johnstown.” Daniel J. Morrell, president of Cambria Iron, was one of those worried about the dam. The first president of the club, Benjamin Ruff, refused Morrell’s repeated requests that the dam be strengthened: “You and your people are in no danger from our enterprise.”

The dam was put to the test on May 30, when unusually heavy rains hit the area. In Johnstown people made the usual preparations for flooding, but up at South Fork Dam, John Parke, the club engineer, knew things were more serious, as he watched the lake rising an inch every 10 minutes. He knew that once the water ran over the top of the earthen dam, it would cut through it like a knife, and the whole thing



Changes made by South Fork Club to dam: 1 Fish trap built across the spillway. In heavy rains, debris clogged trap and spillway. 2 Club didn’t repair 2-4 foot sag in

middle. 3 Dam cut down by 1-3 feet. This and sag meant center of dam—the part bearing greatest pressure and which should have been highest point—was only 4 feet

above the bottom of spillway. 4 Stone “riprap” covering face of dam was poorly maintained. 5 Discharge pipes not replaced. Culvert holding pipes carelessly filled in.



University of Pennsylvania

John Parke, the club engineer who, after trying in vain to save the dam, rode his horse at breakneck speed to South Fork to send a warning to Johnstown.

would go. His workers desperately tried to dig another spillway and increase the height of the dam, but the water was rising too fast. Parke was caught in a painful dilemma. He could cut through the end of the dam, where the pressure was less, so it would give way more slowly and reduce the water’s destructive force. But afterwards, how could he prove that the dam would have gone anyway? People would only know that he was the one who destroyed the dam and flooded the valley. He chose not to do it.

When the dam started to go at 3:10, Parke wrote later, “the fearful rushing waters opened the gap with such increasing rapidity that soon after the entire lake leaped out. . . . It took but forty minutes to drain that three miles of water.” One observer said the break “roared like a mighty battle.” Twenty million tons of water took its natural course, dropping 450 feet in 14 miles, at times 70 to 75 feet high and reaching speeds of 40 miles per hour. Now all lines were down, and no more messages could be sent to Johnstown. In 57 minutes the wave would engulf the town. Over 2,200 people were tragically unaware that death was already moving down the valley.



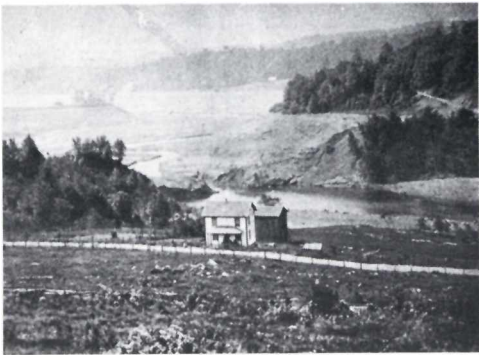
Two worn abutments are all that remain of what was one of the largest earthen dams in the world in 1889. The old lake-bed behind the dam and the quiet Little Con-

emaugh River give little indication of the awesome power released the day the dam broke, causing the deadliest flood in the Nation’s history.

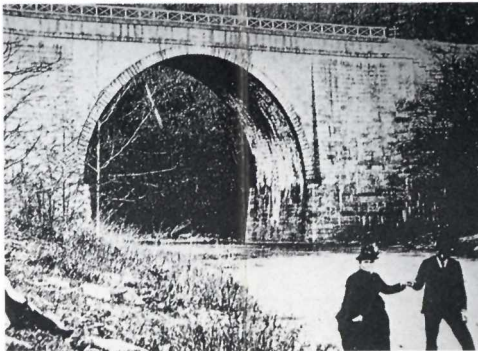
Johnstown Flood

In the Flood's Wake

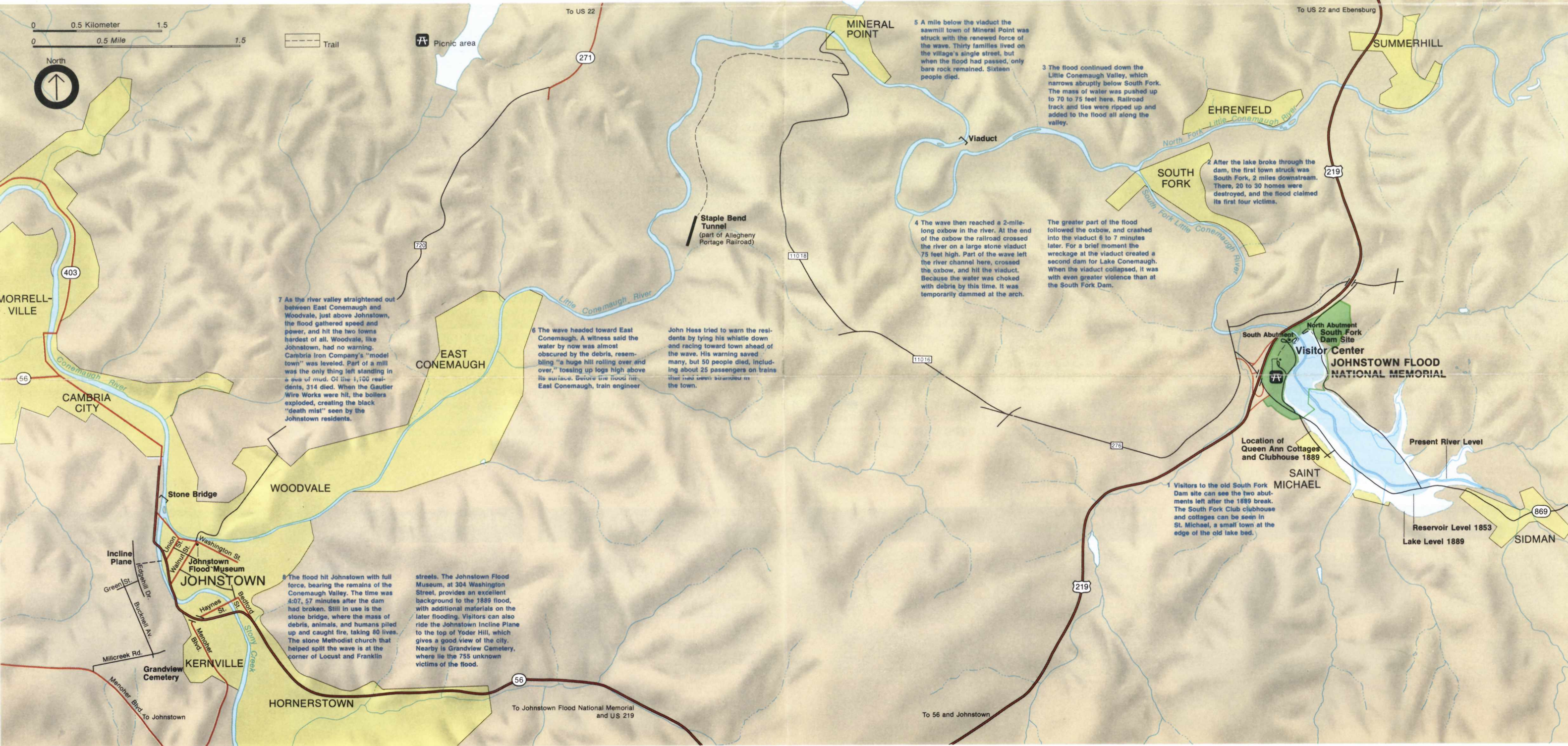
Lake Conemaugh broke through the South Fork Dam at the velocity and depth of the Niagara River as it goes over the falls. Farmers below the dam described the wave as "a turbulent wall of water, filling the entire valley." At times the tons of debris gathered by the wave caused it to choke up in the narrow valley, stop momentarily, then explode forward again with greater power. The debris actually spared Johnstown even worse destruction, as it slowed the wave to a maximum speed of about 40 miles per hour. The water would have reached 60 to 90 miles per hour if it had rushed unimpeded down the valley.



The South Fork Dam (left) didn't burst. Observers remember the water gouging out a "big notch," then cutting down rapidly through the earth. Then the whole dam seem to push out all at once. Not a break, just one big push. The 85-foot viaduct (right) temporarily stopped the flood when debris jammed against its arches. A second Lake Conemaugh, deeper than the original, formed behind the viaduct before it collapsed.



Locomotives at East Conemaugh trainyard (left) were thrown around like toys, some ending up a mile away. A lucky engineer jumped on the only one not overturned. Only mills in background (right) withstood the wave as it tore through Woodvale. The rest of town was reduced to mud flats. The destruction of the wire works released miles of barbed wire, adding to the terror of those caught in the flood.



Shattered buildings were thrown into piles three stories high, completely filling some blocks.



The flood snapped large trees like sticks and turned them into battering rams that could pierce walls.



Cambria Iron Company's prompt reassurance that mills would be rebuilt heartened the many Johnstown citizens who depended on them.



A jam at stone bridge caused a 10- to 30-foot lake over Johnstown. The fire there, probably caused by oil and hot coals, burned for 2 days.



As soon as the water receded, rescue workers began searching for survivors and bodies. Some waited days to be rescued.



Survivors lived in army tents and lean-tos. Prefabricated "Oklahoma" houses, furnished with essentials, were later sold for \$250.