

THE JOHNSTOWN FLOOD

By JOHN BACH McMASTER

I.

Note. Among the papers of the late John Bach McMaster was the unpublished draft of a history of the Johnstown flood and of the measures taken to relieve the distress of the sufferers. It now reposes in the Manuscript department of The Historical Society of Pennsylvania, the gift of the author's son, Dr. Philip D. McMaster. The bursting of the dam, the sweep of the released waters down the Conemaugh valley and the destruction of Johnstown and the industrial villages around it on May 31, 1889, was a disaster which awakened the horror and sympathy of the nation and of the world. It was obvious that the relief of distress must be systematic. Such a work was one for responsible hands and Governor Beaver of Pennsylvania appointed a Commission, composed of respected citizens. Robert C. Ogden, Esq. a capable, intelligent and philanthropic gentleman in Philadelphia, was one of its active members and, in the Governor's absence, served as its chairman. More than \$3,000,000 came in from various sources for distribution to the injured, starving and homeless people. Before the work was done dissensions arose. Whether these were induced by a developing schism in the dominant Republican party, and were aimed at Senator Quay, who was seen standing behind the Governor, or whether the furore was the result of misunderstandings and dissatisfactions, inevitable in a local community in which there are conflicting claims to charity, it would be unprofitable to inquire. By way of explanation and defense Mr. Ogden was of opinion that a veracious history of the event, with an account of the Commission's stewardship of the funds entrusted to its care, should be prepared. His own words describing the plan are found in the *New York Herald* (issue of October 31, 1890), which, more than a year after the flood, was making a sensational attack upon the Commission.

"We are now having a report of our general plan of distribution written, explaining it to the world", he said.

"Is that the book Professor McMaster is writing?" the reporter asked.

"Yes. It is to be a general history of the flood from a scientific standpoint, not a mere collation of newspaper reports and hurried statements. It will also expound our system of relief."

"How much is Professor McMaster to be paid for the book?"

"There has been no price yet agreed upon. The book will be paid for by the Commission as an official report, and will be distributed gratuitously to all contributors to the fund. It is not a money-making enterprise."

The controversy became angry and Mr. Ogden suggested that Professor McMaster go no farther with his writing. The unfinished chapters are in the historian's vividly graphic style and the first two, describing the flood, deserve to be printed in *The Pennsylvania Magazine of History and Biography*. The record is particularly valuable because of the knowledge which, as a civil engineer, the author could bring to bear upon the train of events. The second and concluding installment will appear in the October issue.

ELLIS PAXSON OBERHOLTZER.

During the closing days of the month of May, 1889, a storm developed in the central Rocky Mountain region, traversed Kansas and Missouri, crossed the Mississippi, entered the Ohio valley and then divided. The principal area of low pressure turned northward and passed over the region of the Great Lakes to New England. The secondary disturbance moved eastward over the Allegheny mountains into Virginia. The characteristics of the storm were the unusually slow and regular rate of movement, the high temperature, the violence of the local storms developed along its path, dense saturation and, consequently, enormous rainfall.

The normal winds along the shores of the Middle and South Atlantic states are from south to west. But such was the distribution of pressure over the Atlantic on the night of May 29th that, on the morning of the 30th, the winds were blowing steadily from the south and east. On that morning, therefore, the forecast issued by the Signal Service, predicted severe local storms in the Middle and South Atlantic states. The prediction had hardly been made when it began to be fulfilled and at seven, on the morning of Decoration Day, rain was falling along a line reaching from New York City and the seaboard of New Jersey, across central Delaware, across Maryland to the mouth of the

Potomac and so on to the south boundary of Virginia. As the wind was blowing from the southwest the rain drifted slowly northwestward. By three in the afternoon the line had moved inland to the eastern slopes of the Alleghenies. By seven in the evening it had crossed the mountains and by midnight skirted the shores of the lakes from Rochester, through Buffalo and Erie to Cleveland. Over all this region the duration of the storm was from thirty-two to thirty-six hours and the rainfall the most excessive ever remarked for so great an area. Starting on the western border with a fall of two inches, the precipitation grew larger and larger as the saturated winds approached the ridge of the Alleghenies till it was, on the ridges themselves, at least ten inches. Over all central and western Pennsylvania, from Harrisburg to Pittsburgh, from Maryland on the south to McKean county on the north, the average fall was more than seven inches.

Most of this fell during May 31st. Everywhere on that day the rain is described as coming down not in drops, but in "sheets," in "cloudbursts," in "masses." At Grampian hills in Clearfield county six inches fell in seven hours. At Emporium in Cameron county the fall was two and one-half inches in two hours. Assuming the average fall at six inches, and the area at twelve hundred square miles the total quantity precipitated in western Pennsylvania would, in round numbers, be 4,320,000,000 tons of water.

The work of carrying off this enormous fall of rain devolved on four great rivers,—east of the mountains, on the Susquehanna and Potomac; west of the mountains on the Allegheny and Monongahela—and before noon on the 31st every branch or creek that fed them was a roaring torrent. Of the Susquehanna the largest tributaries are the West Branch and the Juniata. So great is the drainage area of these streams that a rainfall of three inches has never failed to produce most

ruinous floods. It may well be supposed, then, that the eight inches which fell on the 30th and 31st of May produced a flood the like of which had not been known in Pennsylvania. Indeed there had been but two floods since the state had been inhabited with which that flood of 1889 may be compared—the flood of 1786 and the flood of 1865. But each of these was surpassed.

Along the West Branch lie, in the order named, between the source and its mouth, the counties of Clearfield, Clinton, Cameron, Lycoming, Union and Northumberland. In each of them the storm began late in the afternoon of Decoration Day and increased steadily in violence till Saturday morning. By that time every little creek and stream had overflowed its banks and was sweeping the wreckage of all the farms along its banks into the West Branch river.

That a flood was imminent was first apparent at daylight on the morning of Friday, May 31st, when the headwaters of the West Branch were observed to be running twelve feet deeper than usual. At the town of Clearfield, when the people awoke, the river had overflowed its banks and as early as five in the morning was running through the streets of the town. When dusk came there were but five dry spots in the whole place, and these were covered long before midnight. At Renovo the river was brimfull at five in the afternoon and one hour later the water entered the yards of those who lived on the river bank in the low part of the town. This, it was supposed, was the worst; but the worst was to come. By midnight three-quarters of the town was under water, the bridge carried away, the outhouses and sheds destroyed, the hotel ruined and the opera house demolished by a building carried down by the flood, the bottom washed out of the borough reservoir and hundreds of people driven from their homes. Many of these were laboring men whose houses along the river bank represented the savings of a lifetime. In

some cases the very ground on which their houses stood was undermined and carried off. For miles down the river the banks were strewn with the wreckage, chairs from the opera house, furniture from the shops and dwellings, gates, outhouses and pieces of barns.

At Lock Haven the damage was greater yet. The town stands in a deep valley at the junction of Bald Eagle creek with the West Branch and is deeply concerned in the lumber trade. Early in the day messages had come by telephone from Clearfield announcing the flood at that place, and preparations had been made for high water. But no one supposed that the flood, great as the messages said it was, could possibly reach the high-water mark of 1865. When, therefore, at eight o'clock in the evening the river began to rise no alarm was felt, though even then the rain was falling in torrents. But when, toward midnight, the West Branch ran bank full, and a few minutes later began pouring into the cellars of the houses the people for the first time realized that no common flood was upon them. Some left their homes and hurried to the houses of others on higher ground only to be again driven out. Some fled with valuable horses and cows to the hills or dragged them to the second stories of the houses to await the going down of the water. Hundreds sought refuge in the school house and the court house. At two in the morning the great lumber boom gave way and millions of feet of logs went down the river on their way to Chesapeake Bay. Before dawn the water of the West Branch and Bald Eagle creek had joined and turned the valley from hill to hill into a vast lake of rushing water. Sidewalks were torn up. Stables and outbuildings, barns and coal-sheds and wood-houses were swept away. Sawlogs and driftwood, boards and piles, littered the street as the flood went whirling through the town. The gas works and electric light plant were destroyed and the town left in darkness. The little stream

that furnished the water supply became a raging torrent, washed out the two reservoirs and tore up 150 feet of the main supply pipe. When at four in the afternoon of Saturday, June 1st, the flood stopped rising, the city was completely submerged and the water three feet deeper than in 1865. From every part of Clinton county now came a report of farms damaged, of crops washed away, of bridges broken down, of roadsides cut, of mills destroyed, of trains wrecked, of lives lost. At Millhall, at Salona, at Washington Furnace, at Hamburg in Nit-tany valley numbers were drowned.

Rushing down the river the flood reached Williamsport in the early hours of the morning of June 1st, and before noon the history of Lock Haven was repeated. At two in the morning the water in the West Branch was seventeen feet deep and rising rapidly. At three the 75,000,000 feet of lumber from Lock Haven, set free by the breaking of the Lock Haven boom, began to run into the boom at Williamsport. The logs it was thought could be held on a twenty-foot flood—but when, at three thirty, the water was running nineteen feet deep, and the rain still falling in sheets, it became apparent to all that the boom must go. At nine it went out and 150,000,000 feet of sawlogs began a journey to Chesapeake Bay. Then followed every kind of manufactured lumber, sashes and door frames, pickets and shingles, from the yards along the river bank, mills, bridges, houses and trees. The railroad station was swept of everything movable. The track was washed out and littered with broken cars, boards, trees and sand; and communication of every sort destroyed. Three-fourths of the city was under water and more than one-half of the people were sufferers from the flood. Below Williamsport the scene along the river was one of utter ruin. Lumber, logs, broken buildings lined the shores, or lay stranded in heaps on the islands. Not a farm in the lowlands escaped. At Montgomery four spans and

from five to eight feet of the stone piers of the Philadelphia and Erie Railroad bridge were carried off. Then went the Dewart bridge. Flooding down the river these two soon came in contact with the river road bridge at Milton, lifted it from its piers and together dashed into the Reading Railroad bridge, tore out a span, and, a few moments later, wrecked the Lewisburg and Northumberland Railroad bridge. Meanwhile the water had overflowed the flats above the town, had crossed the brick-yards, the Fair grounds, and Upper Milton, and, entering Milton, met the backwater of Limestone creek and covered the South Ward of the city. At Summit almost the entire town was covered, and the valley up and down as far as the eye could reach was one great lake. It was three on the morning of Sunday before the flood began to go down. Milton was by that time a ruined city—bridges, churches, factories, private homes, stores, streets, pavements, cistern wells, all were damaged.

Reaching Sunbury, the point where the West Branch and the North Branch join to form the Susquehanna, the flood rushed up the North Branch, which was not high, then returned and, finding the main stream choked with water, spread over the surrounding country, destroyed a county road bridge and damaged a bridge of the Reading Railroad.

Not far below Sunbury the Susquehanna received from the west a tributary named Penn's creek, formed by union with two other large streams, the Elk and the Pine, in the mountains of Centre county. At midnight, on May 30th, Elk creek showed no signs of an unusual rise. At two the streets of Millheim, a town on its banks, were full of rushing water, lumber and logs, and the church bells were ringing to rouse the people. An hour later the flood struck Coburn, where Elk creek, Pine creek and Penn's creek meet, raised the water in Penn's creek ten and one-half feet in thirty minutes, flooded

every house in Coburn to the first and in many cases to the second floors, swept away porches, stables and out-buildings, covered the fields with fences and sheds, reapers, buggy-tops and wagons, and formed a lake soon two miles long and half a mile wide. For a few hours the people of Millheim and Coburn were without food, all provisions having been damaged by the flood. Bridges were destroyed, pipes and railroads cut, telegraph lines broken and communication of every kind with the east severed.

From Sunbury to Benvenue and Clark's ferry the Susquehanna for twenty-four hours was a mass of floating débris. At Benvenue the Juniata enters it, and from the Juniata now poured forth a stream that almost equalled the Susquehanna.

Rising at the foot of the Bald Eagle range, and cutting the mountain system of the state at right angles, the river receives the drainage of a watershed some sixty miles wide and one hundred long. Over the watershed the rain had been falling in sheets for thirty-six hours, soaking the earth and far exceeding the capacity of the streams to carry it off. The river from its source to its mouth and every branch and feeder became rushing torrents. In Huntingdon county, through which the Raystown Branch flows to join the Juniata, the destruction of property was enormous. Farms were swept clear of fences, barns, orchards, coops, nay, in many cases of the soil, and rich bottom lands were turned into mud flats not worth the cost of plowing. Sawmills and grist-mills, factories and warehouses were utterly destroyed or wrecked beyond all remedy, and prosperous towns brought to ruin. Thousands of people were deprived of all means of subsistence. Thousands more were stripped of every sort of worldly goods but the clothing on their backs. Hardly a county bridge was left standing.

Every city and town along the Juniata suffered. At

Tyrone, at Spruce creek, at Barree, at Petersburg, the water stood four feet deep on the lower floors of houses near the river. Some were carried away, others were badly injured by floating logs or pieces of bridges. Cattle were drowned and crops washed off. At Huntingdon but little harm was done—a few streets were submerged, a few cellars were filled and a few outhouses thrown down. But at Portstown on the southern limits of the borough the water rose so rapidly that the people were forced to take refuge in the second story of a flouring mill and remained there sixteen hours. At Smithfield, opposite Portstown, every house was flooded and the people driven to the State Reformatory. Three miles below Huntingdon, the Raystown Branch enters the Juniata. There the water was one mile wide and thirty-five feet deep. The Branch is the longest and most turbulent of all the feeders of the Juniata. From its source at the foot of the Allegheny mountains in Somerset county, it flows west through the gap in the mountains at Bedford, turns northward and running along the foot of Tussey's mountain, receives all the drainage of Bedford and half that of Huntingdon county. From Everett, where it emerges from the gap, to its mouth its banks were swept clean. Not a bridge was left standing. At one point twenty-five farm houses and innumerable carcasses of animals were counted passing down to the Juniata. Such was the volume and velocity of the water it discharged that, though the Juniata was running deeper than ever before, the water from the Branch passed directly across it, diverted the river and, striking on the north bank, tore up the railroad, twisted and bent the rails and threw them over the neighboring fields.

Increased by this mass of water the Juniata now became more destructive than ever, tearing away everything it touched and carrying them on to Lewistown. There the river is joined by the Kishacoquillas creek

which, long before the flood reached it, had overflowed and driven people from the houses along its banks. Towards midnight the flood began to appear and by daylight the creek and the river were rising two feet per hour. By eight the stone bridge was covered, torn to pieces, porches, outhouses, boardwalks began to move off, and the wreckage to come down from up the river. For a time the whole surface of the water was a mass of haymows, straw stacks, pieces of harness, chickens, and barnyard animals of every sort. Hard upon them came fragments of bridges from the up-river towns. By noon the county iron bridge at Lewistown was carried off and soon after the railroad bridges, loaded with cars, followed it. The destruction of these bridges severed communication with the Pennsylvania Railroad. But what was worse Lewistown was cut off from its source of supplies. The city lay on the west bank of the Juniata at the foot of a long ridge of hills known as Jack's mountain, and drew supplies from the rich valley of the Kishacoquillas, west of the ridge. One pike entered this valley from Lewistown and this ran through a narrow gap in the mountain, many times crossing and recrossing a turbulent mountain stream. Along this pike came daily all the beef, all the butter, all the milk, all the agricultural products the people of Lewistown consumed. But the streams, filled by the rains, broke down the bridges and left the city without food. A week later, when the agent of the State Board of Charities passed through the valley, he found Lewistown in a most deplorable state. Two hundred and nineteen houses, he reported, had been flooded. Twenty-nine of them had been utterly destroyed, and nine hundred people forced to seek shelter in school-rooms, in engine-houses, in the court house, in lofts over stables and in railroad caboose cars.

Just below Lewistown the river makes a sharp bend eastward, breaks through Black Log mountains and,

crossing the counties of Mifflin and Perry, reaches the Susquehanna. In each county the damage was enormous. From Mifflin went eleven county bridges, fences, houses, live stock, standing crops, factories of every sort and, from one yard, 50,000 railroad ties. The streets of every river town were covered with mud and slime and piled high with wreckage. From Perry went twenty-three county bridges and cribs of the canal. Reaching the Susquehanna and joining with the flood sent down by the West Branch, the water from the Juniata raised the river to a height never known before. At Harrisburg it stood twenty-five feet and seven inches above low-water mark, or two feet and two inches above the flood of 1865. Farms and roads were submerged, hundreds of people driven for shelter to the market-house and the office of the Mayor, and the islands, farms and railroads covered with sawlogs and débris. About the mouth of the river and out on Chesapeake Bay the water was covered with floating logs. Lumbermen estimated that 150,000,000 feet were then afloat, or had stranded on the eastern shore of Maryland. To recover this timber must have cost \$250,000, for the salvage is by law twenty-five cents per log. To bring it back to the mills at Williamsport would be too costly. In ordinary drifts the logs are sold to lumbermen in Maryland. It was now determined, however, to follow the precedent set after the flood of 1865, erect mills near Baltimore and Harrisburg and do the sawing and marketing there. Such as had stranded above the mouth of the Juniata were carried back to Williamsport by the Pennsylvania Railroad.

The railroad had suffered greatly. Hardly a division on any of its lines west of Harrisburg but had bridges swept away, buildings destroyed, road and track undermined, telegraph lines thrown down and cars and locomotives ruined. Along the Susquehanna, between Harrisburg and Renovo, six large bridges were swept

away, eight others were injured, six miles of track were displaced, three miles of road-bed washed out and twenty-seven miles of telegraph line destroyed. Out the Juniata, between the Susquehanna and the mountains, a single-span stone bridge, a two-arch stone bridge, a short iron bridge and three double-track iron bridges, each 625 feet long, were almost entirely ruined. Between Renovo and Clearfield nine small bridges were carried off, six miles of road-bed washed away and fifteen miles of track overturned. Between Lewisburg and Tyrone four bridges were lost, four others hurt and one mile of road-bed washed out. At Keating and Linden, at Lewisburg, Williamsport and Montgomery one hundred and six freight cars which had been placed on the bridges to weigh them down went with them. At Lock Haven a lime car took fire and thirteen cars were burned. Between South Fork and Johnstown three bridges, thirty-three locomotives, eighteen passenger cars and three hundred and fifteen freight cars were destroyed. Three more bridges went out between Johnstown and Pittsburgh, and three in Blair county between Altoona and McKees.

Of the rain, which, in Pennsylvania, fell on the western slopes of the mountains, much went down the tributaries of the Allegheny. Of these tributaries, three more notable for size are Clarion river, Red Bank creek and the Conemaugh river. Rising well up on the sides of the Allegheny mountains and running northwest, under several names, the Conemaugh enters the Allegheny a few miles above Pittsburgh. For twenty-five miles westward from its source, the river runs through deep and narrow valleys, is exceedingly winding and has all the characteristics of a mountain river, and receives in this distance two important feeders, the South Fork and Stony creek. At the mouth of Stony creek, on a broad low flat in a bend of the Conemaugh, shut in on every side by steep hills, was Johnstown, a

prosperous borough of some 12,000 people. About and adjoining Johnstown, and along the banks of these two streams, were nine other boroughs and three incorporated towns, each independent municipalities, but all coming under the general name of Johnstown.

On the Conemaugh, west of Johnstown and below the mouth of Stony creek, was Cambria city. Opposite Cambria city was the Second ward of Millville. South of Johnstown, and separated from it by a sweeping bend of Stony creek, was Geistown; and yet further up the valley were Moxham, Morrellville and Walnut Grove. East of Johnstown, and adjoining it, was Conemaugh borough. Across the Conemaugh and opposite Johnstown and Conemaugh borough were Millville, First ward, Prospect, Woodvale and, half a mile beyond, East Conemaugh. Over the river was Franklin. Each of these boroughs owed its existence and its prosperity to some great industrial enterprise. The valley is rich in coal and iron, and in it had grown up some of the largest manufactories in the state of Pennsylvania.

At Johnstown proper little manufacturing of importance was done. There were the shops and banks, the printing presses, the churches, the hotels, the places of amusement for all the neighboring boroughs and the offices of the great manufacturing companies. But at Moxham were the works of the Johnson Steel Street Rails Company. At Millville and Morrellville and Prospect and Cambria city lived the hands employed in the Cambria Iron Company. At Conemaugh were the Gautier Wire Works. At Woodvale were the flour mill and the woolen mill of the Cambria Company. At East Conemaugh were the yards, the shops, the roundhouse of the Pennsylvania Railroad Company. Four miles beyond East Conemaugh is Mineral Point. Three miles east of Mineral Point was South Fork and ten miles beyond on the summit of the mountain are the head-

waters of the Conemaugh. The mountain top is a broad plane and had never, within the recollection of any man, been visited by such a storm as that of the night of May 30th. Roads were obstructed with water and débris. The pike at Cresson was turned into a creek. Streams, which in the harvest rains never rose more than three inches, now ran four feet deep and, pouring into the Conemaugh, made it, in turn, a torrent. On the summit plane near the western crest is the town of Lilly, and just west of Lilly is Bear Run, a tributary of the north branch of the Conemaugh. The run passes through a culvert under the works. But, on the morning of the 31st of May, the stream was running eight feet deep, the culvert was choked with débris, and the water, backing up, ran over the track from north to south, covering the low ground on the south side and forming a pond twenty-five to forty feet deep and eight acres in area, held in by the railroad embankment. Rising steadily the water in this pond soon reached the track level and once more washed across the tracks, this time from south to north, cut out a channel, swept along the north side of the embankment, undermined the stone retaining wall, and carried out the tracks for three-quarters of a mile and stopped all travel east and west. Yet further west from Lilly is Wilmore station. There, meantime, a landslide had occurred, covering both tracks and breaking down the telegraph lines. Still another slide had happened between Mineral Point and Conemaugh.

When Mr. Robert Pitcairn, Superintendent of the Pittsburgh Division, reached his office on the morning of May 31st, he received word that serious trouble existed on the mountain between Kittanning Point and South Fork; that the track was cut at Lilly's station; that the telegraph wires were down; that the trains were held back, and that landslides had occurred between Wilmore and Summerville and between Mineral

Point and East Conemaugh and west of Cambria city. The trouble seeming to be serious, the Assistant Superintendent, the Assistant Engineer, the Division Operator, the Master Carpenter and a number of line-men were dispatched at once, and by eleven o'clock were under way. Two hours later Mr. Pitcairn set out himself.

The party in charge of the Assistant Superintendent saw nothing unusual till they reached the seven-arch stone bridge which spanned the Conemaugh at Johnstown. There they observed that the water in the river was up to the springing line of the arches, that a great part of Johnstown was under water, that business was stopped, that the people had taken refuge in the second stories of their houses and that along the river front the water in the street was at least ten feet deep and rising, that the lumber boom of the Johnstown Lumber Company on Stony creek had given way and that the logs and driftwood of all sorts were collecting about the arches. The hands of a worktrain which had been called out early in the morning to remove the landslide at Cambria city, and which had come up and taken position on the bridge, were ordered to keep the arches clear of drift. Passing over the bridge to the Johnstown station the freight agent informed them that word had come down from South Fork that the great dam up that stream would surely break, and that the people of Johnstown had been duly notified. After a short stop the party passed on to East Conemaugh which they reached about three in the afternoon. The state of affairs at this place deserves to be described fully.

The river, making a sweeping bend, leaves a broad low flat between it and the hills. On the flat were a roundhouse, yards, houses occupied by railroad employees, the station, tool-house, coal-tipple, turntable, the four tracks and sidings. The New York and Chicago Limited, known as "Number 2," which makes no stop

between Pittsburgh and Altoona, had passed through East Conemaugh on its way to New York, but had been stopped at South Fork by the landslide at Wilmore. The Day Express, known as "Number 8," and on that day run in two sections, was, for this same reason, stopped at East Conemaugh. When the first section, made up of a baggage car, five coaches and a Pullman car, arrived it was put for a while on track No. 1 which was nearest the river. But, as the river was rapidly washing away the bank, the train was shifted to the second siding from the station. The second section when it came was placed on the siding nearest the station and alongside of the first. Beyond East Conemaugh and around the curve was an extra work train. Such was the condition of affairs when the Assistant Superintendent and his party arrived at 3 P. M., and heard that the operator at South Fork had sent word that the water was reported to be running over the face of the South Fork dam. Leaving East Conemaugh the party went around the curve, past Buttermilk falls, to a point near the A O Tower. Quitting his train Mr. Trump started for the tower just in time to see the operator run from it. The water was then rising at the rate of one foot per minute and continued to do so till, suddenly, a wave four feet high rushed by, followed soon after by a second twelve feet high. This was the flood from the broken South Fork dam.

The history of the dam may be told briefly. In the days of primitive transportation, the days of pack trains, and Conestoga wagons, turnpikes, canals and horse railways, the state of Pennsylvania began the construction of a highway for the carriage of passengers and goods from Philadelphia to Pittsburgh. When finished this highway was made up partly of railroads and partly of canals. From Philadelphia a horse railroad went out to Columbia on the Susquehanna; from Columbia a canal wound up the valleys of

the Susquehanna and the Juniata to Hollidaysburg; from Hollidaysburg the famous Portage railroad went over the mountains to Johnstown; from Johnstown another canal led down the valley of the Conemaugh and the Allegheny to Pittsburgh.

To supply the basins and the canal at Johnstown with water two dams were built: one across the Conemaugh just west of the town and one across Stony creek two miles from its mouth. But the supply was soon found insufficient and in 1836 the Legislature authorized the building of a storage reservoir, and, after a delay of three years, voted \$70,000 with which to begin the work. To find a convenient site was a matter of some difficulty. To dam the Conemaugh itself was not advisable, for there was but one good reservoir site in its valley, and a reservoir built on that would have swamped the railroad and flooded the town of Jefferson. Of the branches of the Conemaugh but two could furnish sufficient water to make them useful. One was the Stony creek; but its descent was so steep that in time of flood the stream would be unmanageable. The other was the South Fork and on this the reservoir was constructed.

The drainage area was large. The supply of water was plentiful and certain. The valley broadened into an extensive basin and then suddenly narrowed to a deep ravine, seeming to be intended by nature for the purpose of impounding water, and here the basin, the reservoir and dam were constructed. From the report of the engineer to the Canal Commissioners it would seem that two plans were carefully considered; that of a crib of timber and stone with a washover on top to carry over the water in time of flood, and that of an earth and stone mound, with the crest ten feet above the surface of the gravel, and a spillway at one end. The crib dam was ruled out as too costly to maintain. The earth dam was, therefore, accepted; but 13 years

passed by before the sluice-gates were shut and the water suffered to rise behind it.

As thus completed the South Fork dam was a mound of earth 931 feet long, 272 feet wide in the bottom, 72 feet high and 20 feet across the top which was used as a roadway for wagons. The dam was made of such clayey earth as the neighborhood afforded, built up on horizontal logs, thoroughly watered, well rammed, and riprapped on both the inner and outer faces. The slope of the outer face was one and one-half to one and over this the riprap was heavy. The inner face had a slope of two to one and was covered with a light riprap, well and carefully placed. No breast wall of any kind was made. The base of the dam was pierced by a carefully built cut stone arch culvert which carried five cast-iron pipes each two feet in diameter through which water from the reservoir was discharged into the South Fork, and then sent down the Conemaugh to feed the canal at Johnstown. This discharge was regulated from a gate-house, the remains of the foundation of which are still visible at the bottom of the break.

To prevent the water behind the dam rising to the top and flowing over the crest a spill was cut through the solid rock at the eastern end of the dam. Its width was seventy-two feet and the bottom was nine feet below the crest of the dam. The water, thus impounded, covered a level area of 405 acres, and made a lake 4000 feet long and from 500 to 3050 feet wide.

While the state of Pennsylvania was thus slowly building the South Fork dam, the day when the reservoir would not be needed was fast approaching. The Pennsylvania Railroad had come into existence, had accomplished the feat, so long thought impossible, of climbing the Allegheny mountains and on December 10, 1852, joined with the Portage railroad and made through rail connection from Philadelphia to Pittsburgh. Two years later this Portage road was dis-

pensed with and on February 15, 1854, the first train passed over the Alleghenies without using the inclined planes. From that day the canals and the Portage road were doomed. Transportation along the state line was too slow and too complicated to bring business. The line was, therefore, too expensive to maintain and on April 27, 1854, the legislature ordered it to be sold. But the terms of sale were such that no one would buy. In 1855 another act of a like kind was passed. Again no one was found willing to accept the terms and, after a lapse of two years, the state for the third time ordered her public works to be put up at auction. The lowest price that would be accepted was declared to be \$7,500,000. But, if the Pennsylvania Railroad became the purchaser, the price was to be \$9,000,000. The Pennsylvania Railroad did become the purchaser and on August 1, 1857, the Governor, by proclamation, transferred the state canals and the Portage road to the Pennsylvania Railroad. The canal was now less used than ever. The reservoir seems to have been neglected and in July, 1862, the dam broke.

The cause of the break was stated in the report made by the engineer to have been a defect in the foundations of the culvert through which the discharge pipes passed. Happily small harm was done. As the time was the dry season of the year and the leakage great the reservoir was not more than half full, and the discharge, being mostly at the bottom of the dam and checked and hindered by the fall of waste from above, was slow and feeble. Enough water escaped, however, to wash out some 200 feet of the dam, destroy the embankment of the Pennsylvania Railroad at the South Fork bridge and flood the valley. One year later the upper western division of the canal from Johnstown down to Blairsville was abandoned, navigation on it ceased and, the reservoir being now utterly useless, the dam was not rebuilt for seventeen years.

During these years the reservoir site and land surrounding it, some 500 acres in all, changed hands twice. In 1875 the Pennsylvania Railroad sold it to Mr. John Riley. In 1879 Mr. Riley sold it to Mr. B. F. Ruff, who in time disposed of it to "The South Fork Fishing and Hunting Club of Pittsburgh," of which he was one of the incorporators and first president. The charter of the incorporation declares the purpose of the club to be "the protection and propagation of game and game fish and the enforcement of all the laws of this state against the unlawful killing and wounding of the same." With this end in view the dam was mended, the impounded water named Lake Conemaugh and sixteen cottages and a large club house were put up along its shores. In the break of 1862 the first discharge pipes were left unharmed; but the culvert was damaged and the down stream end washed away. As the lake was to be used in future as a fish preserve the pipes were closed and the culvert gap stopped by a double row of hemlock sheet piling, of which the remains are still visible. Earth was then dumped in without the slightest care being taken to water and ram it, and the new dam thus built up till it was a few feet lower than the old. Local tradition asserts that the old dam was cut down from one to three feet in order to form the twenty-foot driveway, then built along the crest.

So much has been said in abuse of the dam as thus constructed it is worth while to consider what was the real condition of the structure. The profile was good. The earth ought to have been rammed and in the middle of the dam should have been a heavy wall of rubble masonry. Nevertheless it was strong enough without the wall to resist the thrust of any water that would gather behind it. But it is not sufficient that an earth dam should be able to hold back all the water that can accumulate behind it. Freshets and floods must be considered and provision made for the discharge of sur-

plus water, so that should rains deposit behind the dam more water than it is intended to impound the excess may be carried away safely and speedily. Every earth dam is, therefore, provided with a spillway or canal of such capacity as to prevent the water ever rising higher than the crest. In the South Fork dam this spillway was at the end of the dam, and was cut through the solid rock. The width was seventy-two feet and the bottom was at least eight feet below the crest of the dam. The road which passed along the crest crossed the spillway twice on trestle bridges. These obstructions were bad enough and show an utter disregard of the purposes for which the spillway was cut. But the harm they did was made worse yet by the fish guards attached to one of them. Made fast to the posts of the bridge nearest the lake were a row of one-half inch iron rods three-fourths of an inch apart in the clear, and rising eighteen inches above a sill resting there were yet other guards of iron wire netting and, lest they should not be found sufficient, floating logs with projecting nails were provided to keep the fish from jumping over. These logs floated in the water, corner-wise, and rose and fell with the water, being kept in place by means of iron eyes at the ends sliding on a vertical rod made fast to the posts of the bridge.

Examining the ability of the dam to relieve itself of surplus water, it appears that, as the five discharge pipes at the foot of the dam were permanently closed, the capacity of the spillway for discharging water is alone to be considered. The width was seventy-two feet, and the depth eight. The statement has many times been made that the structure had sagged and the crest was lower, by several feet, in the centre than at either end. No good evidence exists in support of this. Indeed photographs of the lake, showing the inner face of the dam, justify the belief that the crest had not sagged so badly. That it was lower in the centre is certain,

for it was at the centre that the water ran over. But, to make the examination as favorable as possible for the dam, the crest will be taken as level, and as seventy feet above the foot of the dam and eight feet above the bottom of the spillway. Under these conditions a stream of water eight feet deep and seventy-two feet wide would have been running through the spillway. The velocity due to this height would be given by the formula:

$$V = 3.31 \sqrt{H}$$

and would be 9.3 feet per second. The area of the cross section would be 655 square feet and the discharge per second due to such area and velocity would be 6000 cubic feet. In other words should the water behind the dam stand just at the crest and water be pounding into the lake in a quantity greater than 6000 cubic feet per second the spillway could not carry off the excess and the lake would overflow the dam.

From the best information that can now be obtained it appears that the water, on the morning of May 31st, rose behind the dam at the rate of ten inches per hour. Taking the area of the lake at 405 acres it would require at least 4084 cubic feet per second to accomplish this rise. Meantime the spillway, had it been unobstructed, would have been discharging water in greater and greater quantities as the water rose behind the dam, but at the moment when the water was just at the crest the quantity would have been 6000 cubic feet. The sum of these two quantities, the quantity running out of the spillway each second and the quantity banking up behind the dam each second, gives the total amount of water running into the lake each second as 10,084 cubic feet. The amount was really very much less, for the fish guards and the bridge posts greatly retarded the flood, and the spillway did not discharge 600 cubic feet at any time.

To secure a discharge of 10,000 cubic feet per second the crest must have been twelve feet above the spillway. It was but eight and, as a consequence, the centre rose steadily and, early in the afternoon of May 31st, it was running one foot deep over the middle of the crest. To long withstand the erosive power of such a sheet of water was impossible. The face of the dam wore rapidly away. A few minutes before three, when unable to resist the thrust, it gave way and 20,000,000 tons of water poured through a gap 430 feet wide and started down the valley of the South Fork.

To form any conception of what this vast mass of water was, is all but impossible. Poured into the Erie canal it would have filled — miles, a distance from Albany to —.* It would have made a stream 500 feet wide, twenty feet deep and twelve miles long. Sent over Niagara Falls, at the same depth and with the same velocity as the Niagara river now rushes on, it would have taken thirty-six minutes to go down. But the reservoir seems to have been emptied in less than thirty-six minutes. It is, therefore, safe to assert that the flood which poured through the break in the South Fork dam each second was equal to that which in the same space of time rushes over the Falls of Niagara. The destruction wrought by this flood was due, however, not only to the mass of the water but also to the speed with which it moved. This speed was greatly determined by the character and fall of the valley through which the flood swept. Barometric readings taken on the crest of the dam and on the railroad track on the trestle, which now replaces the South Fork stone viaduct, gives a difference of level of 100 feet. From the South Fork viaduct to the stone bridge at Johnstown the fall is precisely 304 feet, thus making the difference

* Professor McMaster did not make this computation. His early training as a civil engineer suggested it and he intended to insert the figures to illustrate the volume of the flood.—ED.

in level between the crest of the dam and the Johnstown bridge 404 feet. From these figures it follows that the total energy of the water was that of 20,000,000 tons falling 404 feet. Enormous as was this energy, every gross pound of it was expended before the water came to rest. Much was consumed in overcoming friction between the water and the bed and sides of the valleys down which it rushed. The rest was used up in the work of destruction.

Thrusting aside the earth and stones of the dam the flood set forth with a head wave like a solid wall through which no object whatsoever could penetrate. Everything that it touched—houses, rocks, trees, earth—was gathered up and swept along before it in one confused mass. Not far below the dam was a broad piece of bottom land but the flood ploughed it up and left the bed-rock as bare and clean as if no earth bed had ever been upon it. Rushing on the wave reached the mouth of the South Fork, struck full against the mountain which forms the north bank of the Little Conemaugh river, swelled till it was forty feet above the bed of the river, and parted. One wave pushed up the Conemaugh, and swept over the little town of South Fork.

Just here had been lying all the morning the New York and Chicago Limited. The cause of detention was the washout at Lilly's and the landslide at Wilmore. The train, when stopped, was on the north side of the river at the signal tower. The town is west of the mouth of the South Fork, but a few yards east of the South Fork the track crosses the Conemaugh on an iron bridge in order to reach the village of South Fork, which lies on the south bank of the Conemaugh. As reports of threatening conditions of affairs at the dam came in one after another the conductor, yielding to the remonstrances of the passengers, sent the train across the bridge to the station at South Fork village. An order was then given to the fireman left in charge of

the locomotive that, should the clear signal be given at the tower, he was to run the train with all speed to Summerville. The moment the water was seen rushing down the South Fork the signal was given and the train dashed up the valley, followed by a great wave of water which tore out the iron bridge, lifted the South Fork station, and carried it some distance from its foundation.

The greater part of the flood meantime had passed down the Conemaugh, wrecking freight cars, tearing up the track, washing away the embankment. About one mile west of the South Fork branch the Conemaugh enters a deep ravine, makes a sharp right angle bend, runs due south, describes a semicircle, and flows due north, forming a loop or horseshoe curve very narrow in the neck. The distance round by the river is more than a mile, but the distance across the neck is not over 150 feet. The Pennsylvania Railroad, following the north bank of the river, crosses the neck in a deep cut and, immediately on leaving it, passes over the Conemaugh on the old Allegheny Portage viaduct.

This noble bridge had once been part of the Portage railroad, was of stone, was seventy feet high with a semicircular arch of eighty feet span, and had, for over 50 years, withstood every flood the rains in the valley could send against it. Judging from the water marks the flood, when it reached the curve, must have been forty feet high and, crossing through a narrow ravine and down a steep grade, striking the first bend, it banked and then separated, part going round by the river and the rest, laden with fragments of houses, trunks of trees, rocks and sand, spurted twenty feet deep through the cut and poured down on the viaduct. A moment later the flood which followed the river had come round the curve, struck the wreckage and jammed it into a solid mass against the viaduct. The first wave which had gone up the river and destroyed the village of South Fork, having been checked by the rising grade,

now came down the valley, raised the water at the viaduct till it marked eighty-nine feet above the river bed, and flowed nine feet deep over the bridge. Unable to resist the pressure the structure gave way and was swept out to bed-rock.

Save a little piece of the western wing wall and a few cubic yards of the eastern wing wall, which an enormous boulder had shattered, not a trace of it remained. Nay more, not one stone of the whole structure has since been seen. With the bridge went out a great piece of the embankment, solidly built and faced with a heavy sloped wall. Just below the viaduct the Little Conemaugh, running north, meets a steep hill, makes a right angle bend to the left, runs west and enters the valley in which was the town of Mineral Point. The place stood on a flat, is said to have contained thirty-two houses, a furniture factory and a planing mill. Six houses on the slopes escaped. The factory, the mill and twenty-six houses were utterly destroyed and nothing but the bare rock was left on the site of what had once been little gardens. Here sixteen men, women and children were drowned.

A mile and a half below Mineral Point the river again encounters the foot of the mountains, is again deflected to the left and runs south through a narrow basin a mile long. Before the flood the river flowed close to the western bank. But the head wave, as it came round the bend from Mineral Point, struck the mountain, was deflected to the eastern bank, and then tore out a new channel in which the Conemaugh now flows. At this point are two mountain spurs, pointing in opposite directions, the one to the west, the other to the east, and parted by a deep gorge. To get past the spurs the river makes a double horseshoe bend, flowing first due west, then due east, then south and then west again. The course of the river in other words resembles the letter "S" with the upper curve very sharp and the lower curve long and sweeping. Crossing a bridge

where the Little Conemaugh forms the top of the "S" the Pennsylvania Railroad enters a deep cut through the first spur, crosses another bridge over the middle of the "S" and extends down the west side of the lower curve, skirting the foot of the second spur. On this piece of track, as the water reached the "S," was the car and locomotive of Assistant Superintendent Trump. But the train stood unharmed, for the flood, swinging round the lower curve, was thrown against the outer or eastern bank. Along this bank was the old bed of the Portage railroad built some fifty-seven years ago. Part was rock excavation. Part was rock and earth embankment protected by a heavy slope wall. When the flood had passed, save the rock ledge, not a vestige of it remained for more than a mile.

Having destroyed the embankment of the Portage road the flood swept on to the next bend and there tore out and washed away—striking full against the steep cliff—the four track embankment of the Pennsylvania Railroad at its base. For 2000 feet, rails and ties, ballast and filling, slope wall and the very stones that made it were carried off, and nothing but the well-scoured face of the rock cliff was left standing.

The front of the flood was now a mass of trees, rocks, boulders, mangled houses, cars, earth, everything gathered up in its course down the valley from South Fork. It was, indeed, a moving dam driven along by the thrust of the water behind it. Eye witnesses declared that more than once this wastage actually checked the progress of the wave; that in places where the valley narrowed suddenly the trees and timber, earth and rocks would be jammed so tightly that for a moment the mass would cease to move; that the front would seem to seethe and boil; that great trees would be thrown into the air; and then the dam would rush forward with greater speed than ever. That such jams did take place is quite possible, and will go far to explain the slow progress of the flood. From Lake Cone-

maugh to Johnstown the distance by river was something over sixteen miles. Had there been no friction, the theoretical velocity of such a mass of water falling such a distance would have been sixty miles an hour at South Fork village; seventy-seven at the viaduct; and 113 at Johnstown. Even allowing for friction the distance from the broken dam to Johnstown ought to have been traversed in twenty-five minutes. The time actually consumed was one full hour.

The last of these stoppages is said to have occurred in the narrow valley above the town of East Conemaugh. The town lies at the foot of the Alleghenies; was largely inhabited by employees of the railroad; was the place where trains were made up to be taken over the mountains; was the site of a large yard and a sixteen-stall roundhouse for the accommodation of locomotives used as mountain helpers. In the yard, on the afternoon of May 31st, were a number of freight cars, and three passenger trains, two of them being sections of the Day Express from Pittsburgh detained by the washouts ahead. In the roundhouse and about the yard were, all told, thirty-three locomotives of the type known as "Consolidation." Some with their tenders weighed 170,625 pounds. The weight of the lightest of them was 147,640 pounds. But it mattered little what they weighed for nothing that the flood touched withstood it. Sweeping the dam of wreckage before it, the wave utterly annihilated half the town of East Conemaugh, turned the site of part of it into a new channel for the river, carried away the roundhouse, turntable, turntable pit, machine shops, coal-tipple, sand house, station house and thirteen dwellings; tore up the tracks, and scattered twenty-three of the locomotives over the valley. One was found buried in sand and rocks 4849 feet below its original position. Another was moved 4600 feet. Four were carried distances varying from 2190 to 2350 feet, three between 1000 and 1200 feet, thirteen from 480 to 990 feet. Each

of the others had been displaced at least 100 feet. Many of the tenders were torn away from the locomotives and carried down to the jam at Johnstown. Others were strewn along the bank and covered deep with sand and boulders. One which seemed to have been driven sideways against a tree was found broken through the middle and wrapped round the stump.

The flood had now entered the thickly settled part of the valley and was on the outskirts of Johnstown itself. Along the south bank of the river the line of settlement was almost unbroken, and there the enormous power of moving water was finely displayed. Franklin, just opposite East Conemaugh, was all but destroyed. In Woodvale, just below Franklin, nothing was left standing but the broken walls of the woolen and flouring mills, and one single span of a light overhead bridge across the railroad. Not one house in the town proper remained. Through Conemaugh borough the flood made a broad track and, splitting into three parts, entered Johnstown. The main body travelling almost due west, passed through the heart of Johnstown, swept everything before it for three blocks back from the river, crossed Stony creek and struck squarely against the base of the mountain. There the head wave was stopped, and an immense quantity of wreckage deposited, while the water splashed up the side of the mountain. Falling back a moment later it was met by the strong current still rushing down the valley, was deflected, rushed up Stony creek, carrying all manner of débris with it, swept over Kernville and Grubtown and reached Moxham, three miles from the mouth of the creek. Checked by the rising grade the water started back down the opposite side of the creek towards Johnstown, met the current of the Conemaugh, was again swept toward the mountain and completed the whirlpool. Round this whirlpool went houses, freight cars, human beings, cattle, everything in short which the water had gathered up. Some of this material was

dropped at the foot of the mountain; some over Kernville; some, thrown out to the edges of the current, was distributed at intervals along its track.

While these things were taking place south of Johnstown, a condition of affairs, more terrible still, existed on the north. Not far below the junction of the Stony creek the Pennsylvania Railroad crossed the river on a fine stone bridge. It was built for four tracks, was fifty feet wide on top, thirty-two feet above the water line, and had seven stone spans of fifty-eight feet each. Had the flood struck this bridge as fairly as it did the Portage viaduct, it must, beyond all question, have been destroyed. But, striking full against the mountain, no small part of the energy of the water was consumed. So much, therefore, as was deflected down stream went with speed and energy greatly diminished; it was stripped of its wreckage by the bridge piers and quickly built up an almost impenetrable dam. Rising rapidly behind this dam the water attacked the earth embankment forming the bridge approach, wore it away and, laden with sand, stone, fragments of houses, trunks of trees, bodies of men and animals, poured down into the yard of the Cambria Iron and Steel Company. The end of the rail mill was torn out, the plant destroyed, a train of freight cars covered with earth and stones, 148 houses swept from Cambria, and a mound of stones five feet deep and 250 feet long deposited in the city. Below Cambria the damage was slight and the flood passed down the Conemaugh and the Kiskiminetas, depositing wreckage and human bodies along the bank at every turn.

Meanwhile the valley above the stone bridge had been turned into a lake of filthy water. All Johnstown, Cone-maugh, Woodvale were covered. Above the surface rose a few church spires and the upper stories of houses untouched by the flood. On the shore were gathered thousands of people whose homes were beyond the reach of the waters, or had been cast ashore from drift-

wood. Thousands more had been drowned, or were clinging to the roofs and other parts of houses that made up so much of the débris that covered the river bed from the stone bridge to Johnstown. The character of the wreckage defies description. In it, packed by the force of millions of tons of water moving at nearly sixty miles an hour, were all the trees met by the flood, earth and stone, pieces of bridges, rails and ties, machinery, cars and engine tenders, telegraph poles, miles of wire wrapped round and round whatever it had encountered, pig iron, bricks, boilers, all the spoils of a manufacturing city, all the furniture of innumerable homes, all the contents of innumerable stores and warehouses, all the filth of seven towns, all the animals and almost all the men and women that lived in them. So much as came down at the front of the main wave was broken into fragments and jammed, at the foot of the mountain and against the bridge, into an almost water-tight mass thirty feet deep and extending over thirty acres. Of such as came down with two smaller waves, or was swept away by the backwater, much was not torn to pieces, and it was from this wreckage that most of the escapes were made and most of the rescues effected. In the direct path of the flood nothing of the kind was possible.

Towards six o'clock a car of lime in the jam near the wing wall of the bridge took fire and ignited the débris which burned on steadily for three days. That many wretched sufferers, caught in masses of timber were reduced to ashes is not to be doubted; yet they must, without exception, have been dead long before the fire began. All through that terrible night the fire raged unchecked and when morning came was raging more fiercely than ever. Then, for the first time, those on the wreckage began to think of escape. Some clambered over the débris from houses and so made their way to land. Some, clinging to timbers, paddled to shore.

Some days later, when the reporters began to de-

scribe these scenes, they sent back all manner of false and sensational accounts to their journals. Among such stories is one which cannot go unnoticed. It has been copied by every journal that gave any account of the flood at Johnstown; has been widely circulated abroad; has been the theme of innumerable sermons; has been the subject of pictures in the illustrated weeklies; has called forth more bad verse than any actual occurrence of recent years; and has been given a place in a narrative of the flood which Adjutant-General Hastings, who reached Johnstown the day after the disaster and ought to have known better, has, over his signature, declared to be "reliable," "accurate in detail" and "official."

The story is that of a young man who, seizing a fine horse, rides with all speed down the valley and through the streets of Johnstown, warning the people of the coming flood, till he is himself overtaken by the water and drowned. Sometimes he is called "The Paul Revere of Johnstown," and sometimes "The Hero of the Conemaugh." Sometimes his name is given Daniel Periton, but generally it is Daniel Peyton. Sometimes his ride is through the entire valley; at others through the streets of Johnstown. The favorite version of the valley ride is this:

"A Paul Revere lies somewhere among the dead. Who he is is now known, and his ride will be famous in history. Mounted on a grand, big bay horse, he came riding down the pike which passes through Conemaugh to Johnstown, like some angel of wrath of old, shouting his warning: 'Run for your lives to the hills! Run to the hills!'

"The people crowded out of their houses along the thickly settled streets, awestruck and wondering. No one knew the man, and some thought he was a maniac and laughed. On and on, at a deadly pace, he rode, and

shrilly rang out his awful cry. In a few moments, however there came a cloud of ruin down the broad streets, down the narrow alleys, grinding, twisting, hurling, overturning, crashing—annihilating the weak and the strong. It was the charge of the flood, wearing its coronet of ruin and devastation, which grew at every instant of its progress. Forty feet high, some say, thirty according to others, was this sea, and it travelled with a swiftness like that which lay in the heels of Mercury.

“On and on raced the rider, on and on rushed the wave. Dozens of people took heed of the warning and ran up to the hills.

“Poor, faithful rider, it was an unequal contest. Just as he turned to cross the railroad bridge the mighty wall fell upon him, and horse, rider and bridge all went out into chaos together.

“A few feet further on several cars of the Pennsylvania Railroad train from Pittsburgh were caught up and hurried into the caldron, and the heart of the town was reached.

“The hero had turned neither to right nor left for himself, but rode on to death for his townsmen. He was overwhelmed by the current at the bridge and drowned. A party of searchers found the body of this man and his horse. He was still in the saddle. In a short time the man was identified as Daniel Periton, son of a merchant of Johnstown, a young man of remarkable courage.”

The version of the impossible street ride is finer yet. Having described the young hero, the grand horse, and the ride down the valley, with the flood leaping and plunging behind him, the correspondent brings him safely into Johnstown where, in places, the water was ten feet deep, and then continues—“at last he completed the circuit of the city and started in search of a place of safety for himself. To the hills he urged his noble steed. Tired out with its awful ride the animal

became slower and slower at every stride, while the water continued to come faster and faster in pursuit. Like an assassin upon the trail of its victim, it gained step by step upon the intrepid rider. But the hills are in sight. Yes, he will gain them in safety. No, he is doomed; for at that moment a mighty wave, blacker and angrier than the rest, overtook horse and rider, and drew both back into the outstretched arms of death."

The description is indeed graphic: but there is unhappily not one grain of truth on which to found the incident. The name Daniel Peyton is utterly unknown in the valley. There is no road between Johnstown and the lake, save the pike, which is fourteen miles long, does not pass through the valley nor near the route taken by the flood, and could not be travelled by any running horse in an hour. To ride up and down the streets of Johnstown would have been impossible for they were, when the dam broke, covered with water from three to ten feet deep. The people, in truth, received no warning and knew nothing of the flood till it was upon them.

The wonder is, therefore, not that so many were drowned, but that so many escaped. Conservative men who knew the formation of the valley well declared at first that the loss of life could not be less than eight thousand. Sensationalists who knew nothing of the valley placed the number at fifteen thousand. Happily both estimates were far too high, for it now appears that the total number of persons known to have perished in the flood was two thousand one hundred and forty-two. Three hundred and ninety-one of them have never been found. That some of these three hundred and ninety-one were burned to cinders by the fire at the stone bridge; that others lie buried under the bed of the river, or were washed down the Ohio to the Mississippi is, to say the least, quite probable. Weeks after

the disaster bodies, supposed to have come from Johnstown, were taken from the Ohio at Cincinnati. At Steubenville a body known to have been that of a flood sufferer was taken from the river, identified and returned for burial. Small as the figures are when compared with the random estimates, they are, when considered by themselves, enormous. Taking the valley population at thirty thousand, a high estimate, five years would have passed before so many people would have died from natural causes. The battle of Gettysburg was bloody and obstinately fought. Yet, in three days, the number of men of the Union Army killed outright was but twenty-eight hundred. During the whole Civil War there were, of one kind and another, twenty-two hundred and sixty-one engagements. In but four of these did the loss of life to the Union cause exceed the loss of life at Johnstown. One was the battle of Gettysburg; another was the ten days' campaign round Spottsylvania Court House; the third was the battle of the Wilderness; the fourth was Sherman's long march from Chattanooga to the sea.

Examining the Johnstown statistics still further it appears that more women were drowned than men; that among women the mortality was greatest between the ages of twenty and thirty; and among men between ten and twenty; that three hundred and eleven minors lost fathers, and one hundred and fifty-six lost mothers, and ninety-eight both parents; that one hundred and twenty-four women were made widows and one hundred and ninety-eight men, widowers. For the orphans the greatest sympathy was expressed and offers of adoption came in from all sides. Yet but one adoption was made. But no statement, no comparisons, no figures can set forth the horrors of that terrible Friday night so forcibly as the fact that ninety-nine families, numbering from two to ten persons, were utterly annihilated.