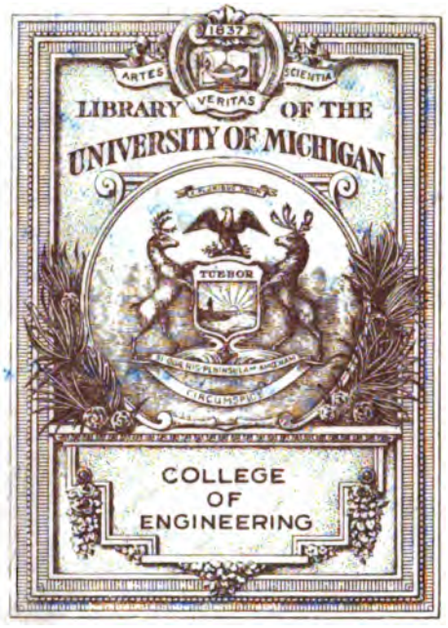
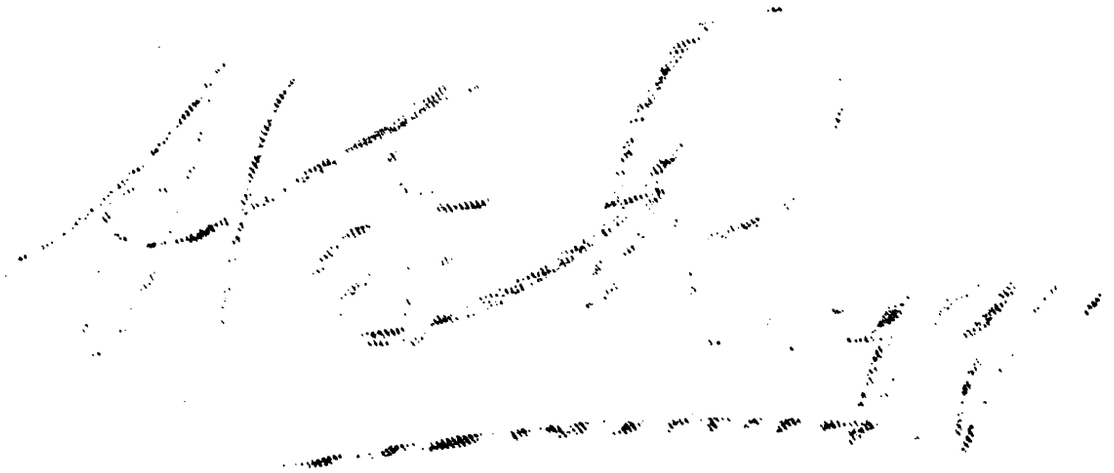




A Railroad to be Rebuilt.

Coshocton, Ohio, west of. March 30, 1913.

Looking toward Pittsburgh from the east approach to Bridge No. 100, over the Muskingum River. The normal channel of the river lies a quarter of a mile or more to the left of the railway, which was carried on a high embankment, 2,700 lineal feet of which was washed away, from 10 to 25 feet deep ; two of the four spans of the bridge were swept away and a third damaged.

PENNSYLVANIA LINES

WEST OF PITTSBURGH

A HISTORY

OF THE

FLOOD

OF

MARCH, 1913

COMPILED

BY

C. W. GARRETT

PRESS OF
WM. G. JOHNSTON & CO.,
PITTSBURGH, PA.

TABLE OF CONTENTS.

To the Management of the
Pennsylvania Lines West of Pittsburgh:

By your direction, there has been prepared and is submitted herewith a record of the Flood of March, 1913, and its disruption of the service of your Lines, in such detail as to give a general idea of the extent of the damage and the progress of the work of restoration.

But not in this account of the more prosaic facts, nor in any of the records of the Company, will be found the real story of the flood, unless it be read between the lines by those who were "in the thick of the fight."

By the destruction of most of the means of communication, at the same time that the tracks and bridges were washed away, the system was broken into many fragments; each Division was left pretty much to its own resources, without knowledge as to what had occurred elsewhere and without opportunity to confer as to the best means of restoring service, or to secure information as to material, supplies or men available for repair work. Many Divisions were separated into two or more sections, neither of which had any means of communication with the others.

Just as it was the first thought of the general officers in Pittsburgh that the hundreds and thousands of people whose lives were endangered should be rescued, and that what was left of the railroad should be offered for that service, so was it the first thought of employees everywhere to rescue from the flood those who were in danger. Some manned bridges to take people from floating wreckage or buildings, some manned life boats, some took ropes and poles to the streams; many risked their own lives in saving others or in attempting to save the Company's property from damage. The safety and comfort of passengers enroute was looked after everywhere, sometimes at considerable sacrifice and real risk to the employees in charge of the marooned trains.

When there was no longer need of emergency rescue work, attention was turned to putting the railroad in shape to run trains, particularly trains carrying relief supplies, and the local officers and employees all over the system arranged for service of some sort over such detached portions of the road as were not damaged, or could be put in shape in short time. This necessarily was done without advice or instructions in most cases, and in one instance trains were running over a portion of a Division for twenty-four hours or more before the Superintendent, although only a few miles away, could be informed of what was being done.

To recount the many acts of heroism, the great number of unusual risks taken, the universal devotion to duty, even though that duty involved great personal discomfort, days and nights of work in rain and snow and water, would fill a large volume. It would be unfair to tell a part of the story unless it were all told, and as much of it will never be known except to the men in the field, it is impossible to make a record of it. Neither would it be fair to mention by name any officer or employee of the Company unless all who had a place in the work of restoration were named.

It must be enough to record that, without exception, the officers and employees of the Pennsylvania Lines went to work, each in his own place, to restore railway service through the flooded districts; braving every hardship, making every necessary sacrifice, bringing to the work all the resourcefulness and enthusiasm at their command. Many found it the most thrilling and eventful experience of a lifetime. Throughout the whole undertaking, there was the one dominant spirit of co-operation,—voluntary, unconscious co-operation usually, but even for that the more effective. Men from widely separated portions of the Pennsylvania System, many of whom had never even heard of each other before, worked together, or in relays on the same job, just as though they had been always accustomed to each other's ideas and methods.

To put the history in the most convenient shape for reference, the general situation, as it was known from day to day to the general officers in Pittsburgh, is first outlined. Rather than list in detail the points at which damage was done, and the portions of the road over which it was possible to perform some sort of public service, maps have been prepared to show in green that portion of the Lines where the high water covered the tracks, etc., so that it was impossible to ascertain the actual conditions; in red that portion of the Lines which was actually damaged beyond use; and in yellow that portion of the Lines over which passenger train service, regular or "makeup," was performed for the benefit of the public. Remaining on each map will be found sections of the Lines uncolored, representing isolated pieces of road which it was impossible to reach on account of damage at either end, or which were used only by work trains engaged in making repairs.

Following this daily story of the general situation, will be found a brief history of the actual damage sustained on each Division and the method of restoring service, etc. In this account, each Division is treated separately, so that it will not be necessary to go through a great deal of material to follow the work at any given point. Photographs representative of the actual conditions existing on various parts of the Lines have been used, telling the story of the destruction wrought more clearly and concisely than could be done in any other way.

It is not yet possible to give an account of the permanent rebuilding of the destroyed and damaged bridges, structures, etc., nor the cost of such permanent reconstruction, for some of it cannot be completed for months. This record has therefore been closed with the resumption of service over the temporary roadbed and structures provided to meet the emergency. So much material is available that it has been difficult to decide what to include and what to omit. Too long an account would be wearisome; too brief an account would have little reference value.

General tables of rainfall, height of streams, etc., follow the descriptive text as appendices.

CHAPTER 1.

METEOROLOGICAL AND TOPOGRAPHIC CONDITIONS.

The flood of March, 1913, was brought about by an unusual succession of weather conditions which may possibly never be repeated, but which may recur at any time,* particularly in the spring season.

Preceding the heavy rains of March 23rd to 27th there was a storm of moderate intensity on March 20th and 21st, accompanied by winds as high as 60 to 70 miles an hour, which badly crippled telegraph service through the whole territory served by the Pennsylvania Lines West of Pittsburgh. There was a precipitation of one-half to one inch of rain through the valley of the Ohio and its tributaries, which pretty thoroughly saturated the ground, so that when the heavier rains came, they immediately ran off into the streams.

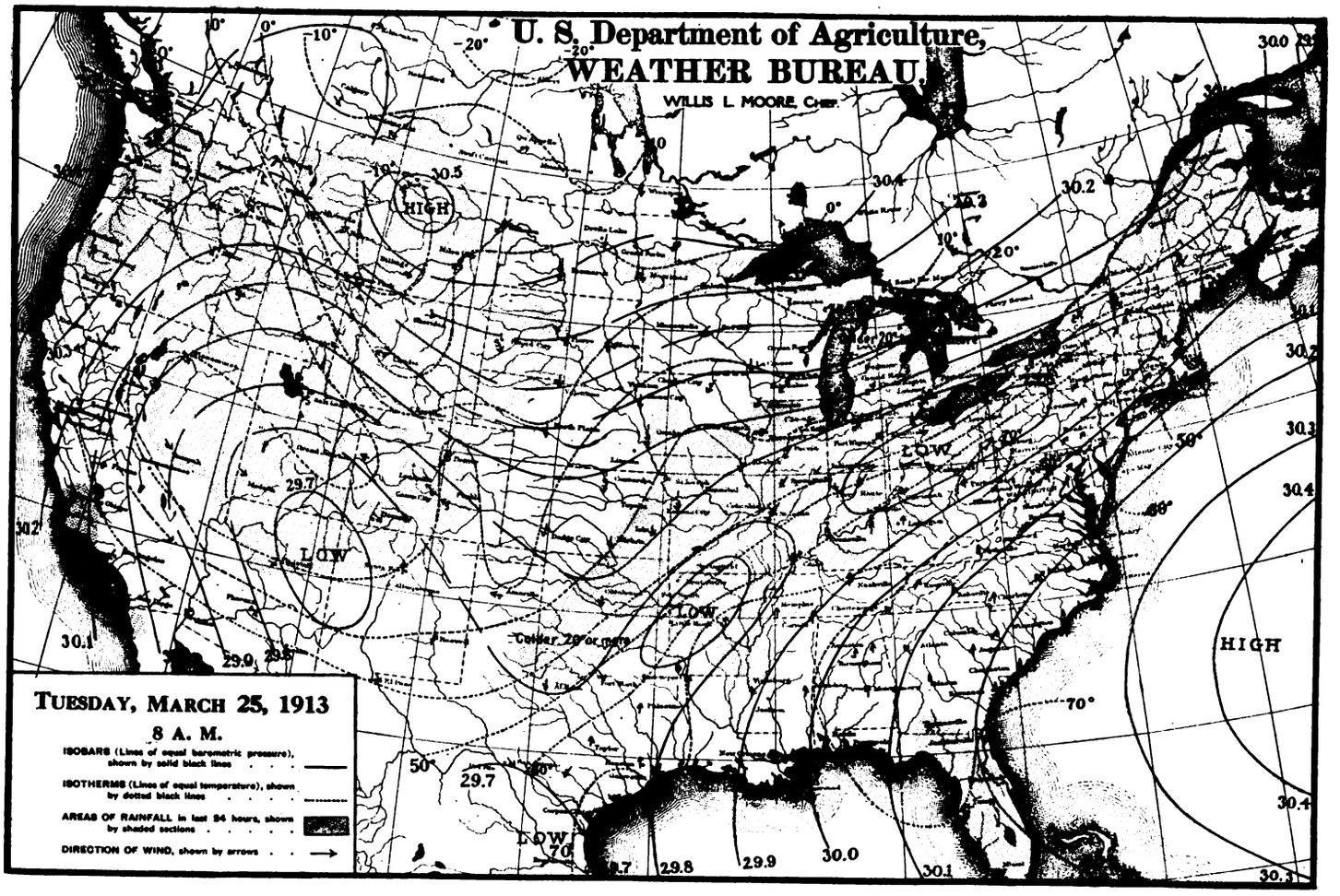
After this storm had passed off through the valley of the St. Lawrence, a storm of great intensity developed in the southwest. On the morning of Easter Sunday, March 23rd, this storm was central over Colorado, and in advance of it, rain was falling in Illinois and Indiana. It moved northeastwardly during the day, and, increasing in force, was accompanied near its center by a number of tornadoes, several of them of high velocity. One of these tornadoes did great damage in the city of Omaha, Nebraska, on Sunday evening, and others were experienced along the path of the center of disturbance, which continued northeastwardly, being in the Sault Ste. Marie on Monday morning, the 24th. As the storm advanced, the area of low barometric pressure, with an atmosphere moisture laden, covered the great central basin. Cold winds from areas of relatively high barometric pressure precipitated this moisture, and on Sunday afternoon and night rain was falling over the entire northern and eastern quarter of the United States.

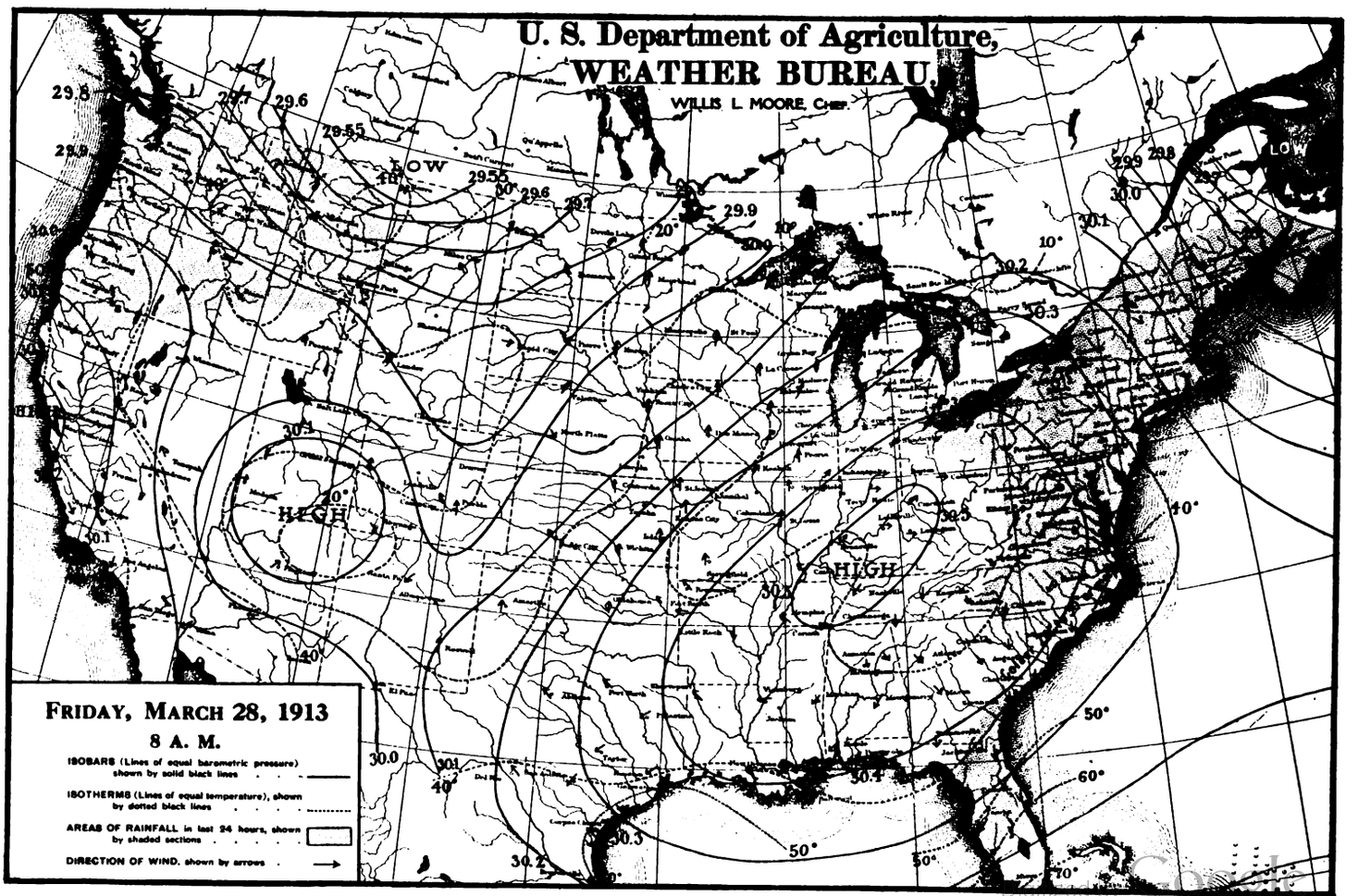
Usually such a storm passes off through the valley of the St. Lawrence, and the low pressure is succeeded by a "high," with clearing and finally much colder weather. On this occasion, although the center of the storm took the usual path, there followed in its wake a "trough" of low pressure, and from day to day there continued to develop new "lows," or centers of disturbance, at the southwestern end of this trough. These "lows" followed each other through the valleys of the Mississippi and the Ohio, and each in turn dropped its moisture in rain as it was met by the cold winds from the "highs" in the northwest and southeast, which kept about the same relative position from Sunday the 23rd until Wednesday the 26th. On Wednesday the "high" advancing from the

* Even before this history was completed, a flood, similar in all except that the the territory covered was very much less, struck the lines in southernmost Ohio,—see Chapter "Marietta Division."

northwest succeeded in "pushing" the trough of low pressure eastwardly. The belt of heavy rainfall, which had for three days been continuously over the Ohio and lower Mississippi valleys, moved eastwardly and heavy rain fell through Pennsylvania, New York and New England on the 27th and 28th.

This unusual combination of weather conditions can only be made clear by a study of the daily weather maps, and in order to make the sequence of events perfectly clear, maps for the six days from the 23rd to the 28th, inclusive, have been reproduced in smaller size on one page.


U. S. Department of Agriculture,
WEATHER BUREAU.
WILLIS L. MOORE, Chief.
HIGH
LOW
LOW
LOW
HIGH
Colder 20° or more
TUESDAY, MARCH 25, 1913
8 A. M.
ISOBARS (Lines of equal barometric pressure), shown by solid black lines
ISOTHERMS (Lines of equal temperature), shown by dotted black lines
AREAS OF RAINFALL in last 24 hours, shown by shaded sections
DIRECTION OF WIND, shown by arrows


U. S. Department of Agriculture,
WEATHER BUREAU.
WILLIS L. MOORE, Chief.
HIGH
LOW
HIGH
FRIDAY, MARCH 28, 1913
8 A. M.
ISOBARS (Lines of equal barometric pressure) shown by solid black lines
ISOTHERMS (Lines of equal temperature), shown by dotted black lines
AREAS OF RAINFALL in last 24 hours, shown by shaded sections
DIRECTION OF WIND, shown by arrows

To one not familiar with such maps an explanation of the departure from the normal may be acceptable.

Usually the isobars, or lines of equal barometric pressure, describe concentric circles, more or less regular, around the centers of high and low pressure. The winds blow from the areas of high pressure toward the areas of low pressure—winds from all directions meeting as they approach the center of the low pressure area, where the movement of the current of air is upward. For the portion of the United States through which the Pennsylvania Lines operate, the general course of the storms is almost invariably from the southwest toward the northeast. Whether these storms originate in the great northwest or the great southwest, they usually approach this territory from Missouri or Arkansas, and leave through the valley of the St. Lawrence.

The areas of low and high pressure succeed each other, in the spring season, usually at intervals of thirty-six to forty-eight hours—each "low," if the pressure be 29.9 or lower, being accompanied by rain.

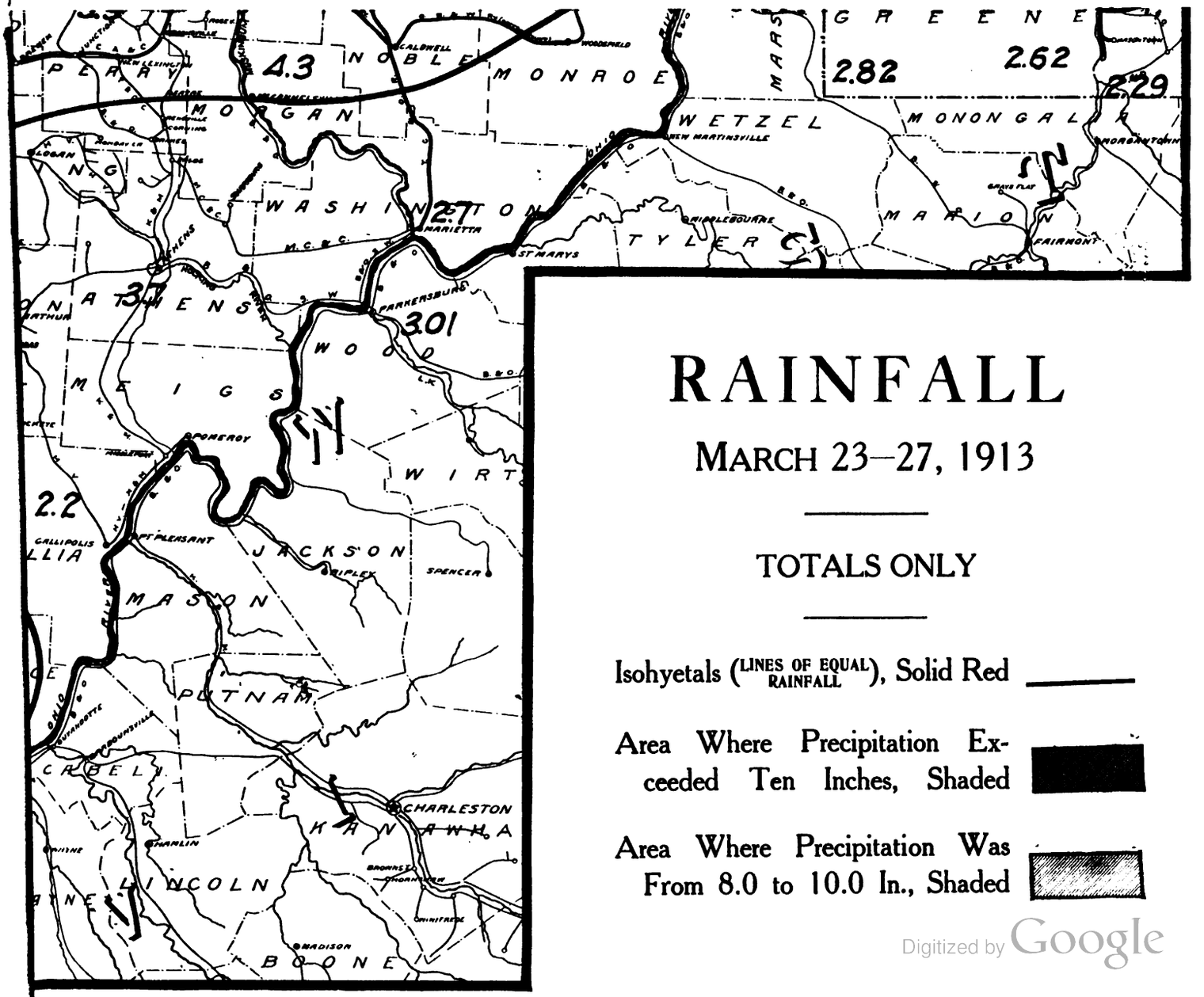
In a general way it may be said that these "lows" are formed by the expansion of air under heat, reducing the relative weight of a given volume of air, and incidentally increasing its hygroscopic properties. This occurs in and near the tropics, and, all conditions favoring rapid evaporation, the atmosphere accompanying a "low" becomes saturated with moisture. Conversely, the "highs" are probably formed by the condensation of the atmosphere in the cold upper strata and in the north. The intensity of a storm—the velocity of the wind and the amount of precipitation—are determined by the difference in pressure, and temperature, of the "highs" and "lows." The moisture carried by the "low" is precipitated where the cold winds from the area of higher pressure meet it. It is unfortunate that the information secured by the Weather Bureau does not cover the country south of our own borders, for in the absence of knowledge of the origin and early path of storms, or of the amount of moisture carried, it is impossible to predict how much precipitation will accompany them. In this instance the prediction made on Monday morning, the 24th, was, for Ohio and Indiana, "Unsettled weather, with rain or snow tonight or Tuesday; colder."

The storm of March, 1913, was unusual in that the original storm, instead of being followed by the usual "high," with clearing and colder weather, was followed by a continuous belt of low pressure (29.7–29.8), as a comet is followed by its "tail." The first "low" (29.3) was unusually low, and the difference in pressures between the high and low pressure areas, for the whole period, ranged from 1.0 barometric inch to as much as 1.5 inches. The rainfall through the states of Indiana and Ohio was from 5 to 11.2 inches in the four days from the afternoon of the 23rd to the 27th. The area of greatest rainfall was in Central Ohio, but the entire central valley was visited by rains heavy enough to bring all the rivers quickly to a flood stage.

The following tabulation of precipitation, by days, through the flooded district will, when it is remembered that the ground was already pretty well water-soaked, show why the rivers so quickly came up to unprecedented heights and then remained there for two or three days. A few representative gauging stations have been selected, and the figures for each day are given to show the distribution of rainfall over the period.

STATION	COUNTY	Rainfall for 24 hour periods ending 8:00 A. M. (inches)					
		Sunday, March 23	Monday, March 24	Tuesday, March 25	Wednesday, March 26	Thursday, March 27	TOTAL
ILLINOIS.							
Cairo	Alexander	.04	.02	4.29	.24	.02	4.61
Chicago	Cook	1.16	.21	.13	1	0	1.50
Casey	Clark	1.17	1.58	1.31	.55	.18	4.79
INDIANA.							
Indianapolis	Marion	1.27	2.76	1.56	.34	.08	6.01
Richmond	Wayne	.88	5.30	4.17	.76	.04	11.15
Terre Haute	Vigo	1.05	2.45	.77	.19	.10	4.56
Fort Wayne	Allen	2.08	1.98	.69	.40	.21	5.36
Winona Lake	Kosciusko	1.73	1.54	1.18	.31	0	4.76
Columbus	Bartholomew	.07	.72	7.00	1.60	.53	9.92
Vincennes	Knox	.20	1.10	6.20	1.30	.60	9.40
Madison	Jefferson	0	2.49	1.78	2.65	.63	7.55
OHIO.							
Columbus	Franklin	.50	2.10	2.96	1.40	0	6.96
Wooster	Wayne	1.20	1.90	4.80	1.40	.80	10.10
Cincinnati	Hamilton	0	2.20	4.20	1.10	0	7.50
Dayton	Montgomery	.50	2.90	3.30	1.50	.80	9.00
Bucyrus	Crawford	1.40	2.10	3.40	1.60	1.20	9.70
Cleveland	Cuyahoga	1.90	1.50	2.70	.90	.20	7.20
Toledo	Lucas	1.90	1.80	1.79	.50	.20	6.19
Canton	Stark	1.00	2.20	3.00	1.60	.60	8.40
Bellefontaine	Logan	1.40	1.50	5.60	2.16	.50	11.16
Marietta	Washington	.20	.10	.70	1.30	.40	2.70
PENNSYLVANIA.							
Pittsburgh	Allegheny	.20	.72	.55	1.66	.38	3.51
Beaver Falls	Beaver	0	.59	1.65	1.79	.92	4.95
Sharon	Mercer	0	1.19	2.92	1.24	.84	6.19
Greenville	Mercer	0	1.34	1.11	3.74	.95	7.14

On a map of the Pennsylvania Lines West of Pittsburgh, the figures for total rainfall for the period have been shown for all points at which reliable observations were made, and an appendix gives a complete detailed tabulation of the rainfall, by days, over this territory.



RAINFALL

MARCH 23—27, 1913

TOTALS ONLY

Isohyetals (LINES OF EQUAL RAINFALL), Solid Red

Area Where Precipitation Exceeded Ten Inches, Shaded

Area Where Precipitation Was From 8.0 to 10.0 In., Shaded

The heaviest rainfall, it will be observed, was over the headwaters of three drainage systems crossed by the Pennsylvania Lines:

1. Great and Little Miami Rivers.
2. Scioto River.
3. Muskingum River.

Heavy rains fell over all the other watersheds, but in these three the amount of water was unprecedented, and the damage was greatest.

The average rainfall for Ohio and Indiana is from 35 to 40 inches per annum. In four days, therefore, one-fourth of a year's rain fell. But much more important is the relative run-off. Of the 40 inches of rain that falls each year in this territory, normally but 10 to 20 inches of water ever finds its way into the rivers; the balance is absorbed by the soil and is gradually evaporated, directly, or through growth of vegetation. With a rainfall of from 8.0 to 11.2 inches over the greater part of the central drainage basin, in about four days' time, the ground being already thoroughly wet, it is apparent that the streams were called upon to take away in less than a week as much water as is usually fed them in six months.

As a consequence, these rivers were higher than they were ever known to be before, the excess over previous high water marks at various points having been as follows:

River.	Location.	Excess over Previous High Water.
Great Miami	Piqua, Ohio	7.7 Feet.
	Dayton, Ohio	7.7 "
Little Miami	Kings' Mills, Ohio	6.5 "
Olentangy	Delaware, Ohio	15.7 "
Scioto	Columbus, Ohio	1.6 "
	Circleville, Ohio	4.9 "
Muskingum	Coshocton, Ohio	5.7 "
	Zanesville, Ohio	15.0 "
Sandusky	Tiffin, Ohio	7.0 "
Wabash	Logansport, Ind.	9.6 "
	Terre Haute, Ind.	3.8 "
White	Indianapolis, Ind.	4.4 "
	Anderson, Ind.	3.3 "

The damage sustained by the railway companies was of four general classes:

1. Undermining of bridge foundations, and washing out of fill at bridge approaches.
2. Washing away of bridge superstructure.
3. Washing away of fill in valleys where railways parallel streams.
4. General damage to track, buildings, telegraph lines, etc., from being covered with water.

In the rapidly rising water, there were carried great quantities of driftwood, logs, hay, trees, buildings—even houses and barns—and these lodged against bridge piers and superstructures and obstructed the stream flow. In many cases the force of this deflected current scoured out the bottom of the stream so deeply as to undermine piers and abutments. In other cases relief came from the approach fills washing out and widening the channel; in many cases the bridge superstructure was pushed into the stream.

The undermining of bridge piers and abutments was typical, occurring to bridges of all railroads alike, and to county and city bridges as well, throughout the water-courses of the three principal drainage basins of Ohio, south of the main watershed, which is shown by dotted line on "Relief Map" (last page). Why, then, have the railroads and municipalities not followed the biblical injunction to found their structures upon the rock, where the vehement beating of the streams could not disturb them? Because, where the railroads cross the rivers and creeks, bed rock is usually from one hundred to four or five hundred feet below the ground surface level of the immediate river valley, and, although a few hundred yards on either side the rock may be plainly in evidence, it is impossible to reach it in most of the valleys. The explanation of this unusual condition is found in the geological history of the country.

At one time the drainage system seems to have been greatly different from that of today. The upper Ohio, for instance, doubtless flowed through the valleys of the Beaver and Grand Rivers into Lake Erie, directly opposite to its present flow. The Muskingum flowed westwardly, from a few miles below the junction of the Mohican and Tuscarawas, to what is now the valley of the Scioto. The basin now drained toward the Great Lakes and the St. Lawrence extended much farther south than it does today.

Later, ice sheets, pushed southwardly by pressure of the weight of snow falling constantly in northern latitudes, covered most of the states of Indiana and Ohio, the approximate limit of travel of the sheet which came farthest south being shown on the "Relief Map" of Ohio. In Indiana, only a small portion of the southern portion of the state escaped. The advance of these ice sheets ground and pushed off the tops of the pre-glacial hills, and with the debris filled up the valleys, leaving the surface a comparatively plain, smooth tableland.

Before the advancing ice, which was probably several hundred feet in thickness, the water was ponded until it overflowed the divides and cut for itself new channels to the south and west, forming the valleys of the present drainage system.

But the streams of the ice age were torrents which cut channels wide and deep. As the ice was melted great volumes of water were liberated, accompanied by more or less loose ice, and it appears that in a great many valleys glaciers alternated with streams. The new channels cut were usually from one to three miles wide, and from three hundred

to eight hundred feet deep. In subsequent ages, these valleys were gradually filled to their present level with gravel, sand and silt, by erosion from the surrounding hills, and by the washing down of the material carried by the ice in its original advance. The streams of today, usually mere rivulets in comparison, wind and turn through these wide, level, glacial valleys, in beds more or less subject to change at the caprice of each freshet.

Some years ago it was thought sufficient to take bridge foundations down in this comparatively recent material to a firm layer of gravel, or, where this could not be easily reached, to support them on piles. The scouring of the present flood undermined bridge foundations of both classes, and has revealed the places where they were not sufficiently deep and demonstrated the necessity of going very deep with foundations for bridges in these glacial valleys, using piling under the masonry when there is any doubt as to the stability of the material encountered.

The third class of damage was sustained where the railways parallel streams, particularly where the tracks are upon fills. These fills acted as levees until the water overran them, when they became earth dams, as the culverts ordinarily providing outlets for ditches and creeks into the larger streams were as a rule not large enough to permit the passage of enough water to the back of the fill to keep the level on both sides equal, owing to the very rapid rise of the rivers. When the water overran the top of the fill, the bank was very quickly washed away, often taking tracks and all with it, and in many instances the track was turned upside down in the adjacent fields. Cars standing on tracks thus undermined usually toppled over into the stream. When the rain ceased and the water went down, the fall was so rapid that the action was just reversed. The water-soaked banks gave way with the receding waters where they had successfully held the rising flood, and in many places the fill and tracks were washed *toward* the streams. Culverts were undermined and their approaches washed out under these conditions in much the same way as the bridges over the main streams were damaged by the principal currents. Many miles of track were saved from serious damage (where the water level was not much over the rails) by stone ballast, which kept the top of the fill from washing.

The fourth and last class of damage was suffered alike by the railways and the entire population of the flooded district. Everywhere the water left great quantities of mud and debris in those buildings which were not bodily carried away by the flood. Telegraph and telephone lines were washed away or broken, so that communication was interrupted throughout the entire district. Water and lighting plants were put out of commission. Exposure to continued rain and cold and the dirt and filth deposited everywhere will be followed by an unusual amount of sickness, and the whole cost of the flood will never be known.

CHAPTER 2.

MARCH 24–25, 1913.

The rain which had started on Easter Sunday, the 23rd, began first to do damage to the property of the Pennsylvania Lines West of Pittsburgh in the vicinity of Piqua, Ohio, in the early morning of Monday the 24th, the water coming up to the track level there, and at several places in the vicinity of Richmond, Ind., at about the same time, and, a little later, along the east end of the Logansport Division. In the afternoon, reports began to come in of landslides in the hills of Eastern Ohio, and of serious interruption of telegraph and telephone service by high water all over the System.

On Monday afternoon and night the rain was the hardest ever recorded at many points over the system. In the 24 hours ending at 8.00 a. m. Tuesday the 25th, 7.00 inches fell at Columbus, Ind., 5.70 inches at Cambridge City, Ind., 4.4 inches at Greenville, O., 4.8 inches at Wooster, O., 3.6 inches at Tiffin, O., and throughout the States of Indiana and Ohio the fall was unusually heavy.

At 4:35 P. M. Monday the 24th, both tracks at Lucas, Ohio, Eastern Division, were washed out and after No. 16 of that date, not a through train went over the Eastern Division for ten days. That night water came up to or above previous flood levels in every stream in Ohio and Indiana, and the Flood of March, 1913, was fairly inaugurated.

The early morning of Tuesday the 25th brought reports that the tracks were covered with water or were badly damaged at scores of places, over the entire system, with service interrupted all through the belt of heaviest rainfall (shaded red on the rainfall map, Chapter 1). As the very high water had not yet gotten far enough down the streams to interfere with service between Columbus and Pittsburgh, the night trains of the Ft. Wayne route of March 24th were brought to Pittsburgh from Crestline to Columbus over the Big Four, and from Columbus in over the Pan Handle. Some of the westbound trains were sent to Chicago over the same route and some via the C. & P. to Cleveland and the Big Four to Crestline. By the time No. 29 arrived at Columbus, however (4:20 A. M., 25th), all the routes from there to Chicago had been broken. This train was returned to Pittsburgh, and later sent to Chicago via Cleveland, and the Lake Shore road from there to Clarke, Ind.

Trains which were enroute on the night of March 24–25 over most of the system were marooned wherever they happened to be when they came to an impassable piece of road,—some at stations, some in the open country; some high and dry, some where they were surrounded with water. No. 13, on the Pan Handle, got as far as Dayton. when news was received that the line was broken in advance, and efforts were made to find an open detour line, but without result, and No. 13 stayed at Dayton Union Station until the waters receded five days later. The story of the rescue of passengers from this train is told in a later chapter.

No. 3 was started north from Urbana over the Big Four, but at West Liberty, where that railroad crosses Mad River, the engine and one sleeper went down with the bridge, the engine going into the water and the sleeper being partly submerged. All passengers were gotten out of the sleeper, but a brakeman riding in it was drowned, and seven passengers and employees were injured. (Photo on page 18.)

This happened at 1:30 A. M. of the 25th, and about two hours later, a work train, enroute from Bradford to a washout at New Madison, O., with twenty laborers, encountered another washout at Bridge No. 58, over Dry Run, west of Gettysburg, O., which went down with the rear of the train, four cars and the cabin going into the water, drowning the gang foreman and five of his men and injuring all the other workmen, as well as the conductor, flagman and brakeman. A photograph of the situation, with cars still in the creek channel, will be found in the Indianapolis Division chapter.

In many places the water had either submerged the telegraph and telephone lines, or broken them with debris, or washed away the poles, so that communication was either entirely cut off or was only intermittently possible over much of the system. Reports of the situation were therefore fragmentary and often inaccurate, and it was difficult to form any idea of the extent of the damage.

It was definitely known on Tuesday morning (25th), however, that service had been interrupted as follows:

Eastern Division: By washouts at Lucas and Lawrence, and a number of bridges damaged between these points.

Western Division: By washouts at Middlepoint and Upper Sandusky.

Erie & Ashtabula Division: By water over tracks in the Mahoning, Shenango and Beaver River valleys, and on W. N. Y. & P. Branch.

Toledo Division, Sandusky Branch: By water over tracks at Delaware, and numerous small washouts.

Akron Division: By washouts at numerous places between Barberton and Mt. Vernon.

Indianapolis Division: By water over tracks and washout east of Piqua; by bridge west of New Paris washed out, and by washout and landslides between Richmond and Dublin.

Cincinnati Division: By washouts between Dayton and Richmond and water over tracks between Xenia and Morrow.

Louisville Division: By water over tracks between Columbus, Ind., and Edinburg on the main line, and between Columbus and Shelbyville on the Cambridge City Branch.

Vandalia Railroad. By water over tracks and washouts on the Vincennes Division.

G. R. & I. Railway: By washouts between Richmond and Ft. Wayne.

As further information came in, it was found that the situation grew more serious every hour. During the day, report was received of additional interruptions of service as follows:

Logansport Division: Water over tracks at Logansport and west to Kenneth, with a concrete bridge washed out on the old line near Royal Center, blocking both routes to Chicago; and by washouts at Mississinewa River bridge east of Ridgeville.

Richmond Division: Four or more bridges down between Camden and Hamilton.

Indianapolis Division: Water over Olentangy River bridge at Columbus, and Scioto River bridge out of line; water over tracks at Urbana.

Cincinnati Division: Miami River bridge at Dayton, west spans out; water over tracks all through Dayton.

Pittsburgh Division: Water over tracks in P. M. at a number of points; bridge over cattle pass east of Conesville washed out in evening, and at 10:15 P. M. two spans of the west end of the bridge over Muskingum River (Br. 100) at Tyndall went out.

Marietta Division: Water over tracks at many points, with land slides and washouts at a number of places.

In the afternoon of the 25th the Weather Bureau Office at Pittsburgh sent out warning that, in view of the heavy rainfall and the prospect of a continuation of it through Indiana, Ohio, and Pennsylvania for the balance of the week, the rivers would doubtless exceed all previous high water marks. Reports coming from all sides of damage to railroads, and to cities and towns, indicated that no routes would probably be available for several days for the through trains, except by long detour, and arrangements were made to represent the more important schedules for local service.

In the evening, the General Manager of the Pennsylvania Railroad proffered the aid of men or material as might be needed, but in the absence of actual knowledge of the extent and nature of the damage sustained, definite acceptance of the offer had to be deferred until the following day.

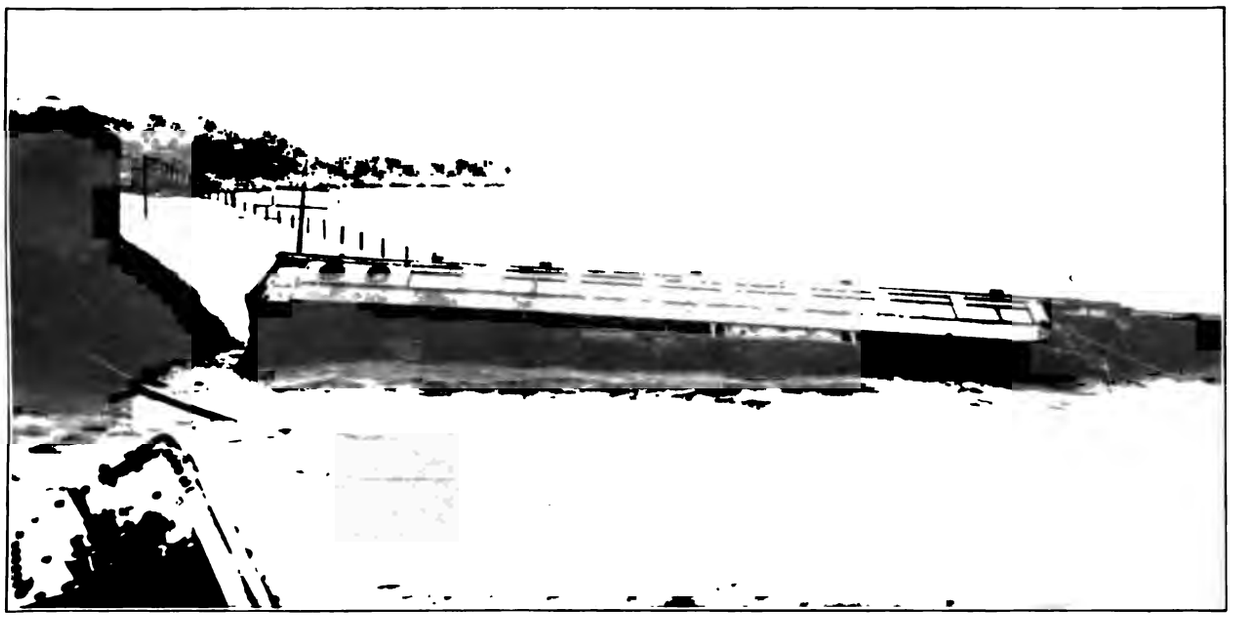
Night came on with rain still falling in torrents over practically all the territory traversed by the Pennsylvania Lines. The water began to fall a little at the headwaters of the streams, as the rain was not quite so heavy, but in the main channels it continued to rise all night, as the high water from above was augmented by that from the swollen tributaries.

In the absence of definite information as to the extent of damage or the amount and character of repair material needed, officers in Chicago arranged in the afternoon for several cars of piling and bridge timbers for immediate shipment, and borrowed a pile driver from the Chicago and Western Indiana Railroad, fitting up a commissary train to accompany it, as well as another complete train, both of which might be sent where needed. Arrangements were also made at all points to secure as much stone, slag, cinders and other filling material as could be found, arrangements for its distribution being deferred until it was known where it could be used first to best advantage.

In the afternoon the Passenger Department issued a circular to all ticket agents, instructing them to sell tickets for points in the flooded district subject to delay, passengers to be so advised.

On account of the storm, very few photographs of the flood were made by the residents of the flooded country, most of whom were busy saving themselves or their effects, or those of their neighbors, and such photographs as were made were usually poor for lack of light. This same condition existed for two or three days, while the flood was at its height, but a fairly representative number of pictures of the conditions as they existed have been secured and have been included with the chapter for the day on which they were taken.

The map which follows shows the situation on the Pennsylvania Lines West of Pittsburgh for March 25th, and is self-explanatory.



West Liberty, Ohio. Wreck of No. 3, of March 24-5, 1913.

No. 3 was detoured north from Urbana over Big Four Railway, but at West Liberty the engine, backing, went into Mad River, and one sleeper, which followed it, lodged on its side on the river bank. Tank visible, but engine completely submerged.

Loudonville, Ohio, west of March 25, 1913.

Bridge 139, Eastern Division, "Double Barrel" stone arch over roadway and mill race, later washed out. The stream which parallels the railway is the Black Fork of the Mohican River.

Delaware, Ohio. March 25, 1913.

Pennsylvania Lines Passenger Station just over treetops at right of picture, with water at eaves of shelter shed. The livery barn in the foreground collapsed shortly after, and one or more of the persons on it were drowned.

Delaware, Ohio. March 25, 1913.

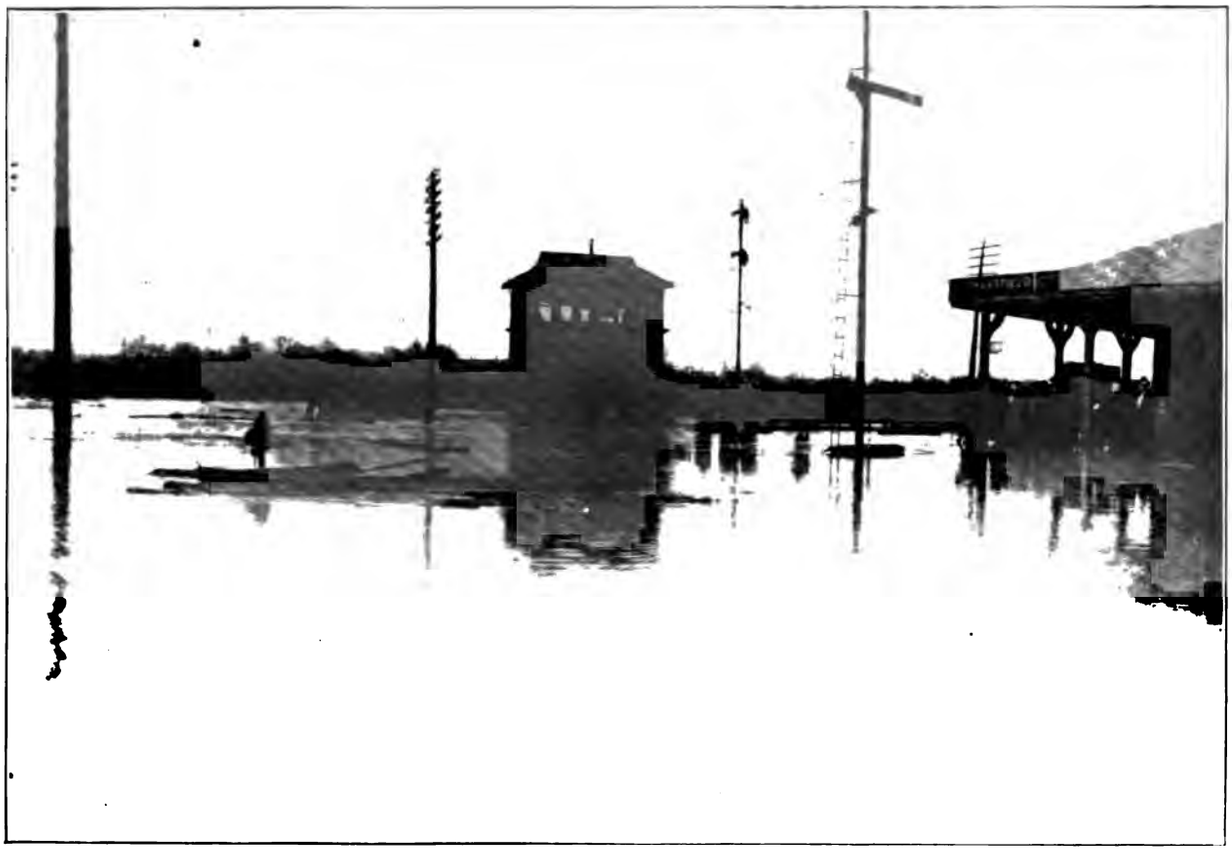
Looking east from Main Street. Pennsylvania Lines freight house and water tank may be distinguished by an X marked over them.

Sharon, Pa. March 25, 1913.

West side Shenango River, near Budd Avenue.

Brink Haven, Ohio. March 25, 1913.

Looking across Mohican River valley, just above Akron Div. Bridge 68, both approaches to which were washed away.



Mansfield, Ohio. March 25, 1913.

Union Station and interlocking tower; Erie Crossing under water.

Coshocton, Ohio, March 25, 1913.

Junction of Walhonding and Tuscarawas Rivers, forming the Muskingum. Trestle over lowland between Bridges 1 and 2, Walhonding Branch (about 1,200 feet), and approach to Bridge 1, where brush is over track in foreground, later washed away.

Mount Vernon, Ohio. March 25, 1913.

South of station; waters of Kokosing River pouring through fill of Akron Division main track.

Piqua, Ohio; Bridge 50. March 25, 1913.

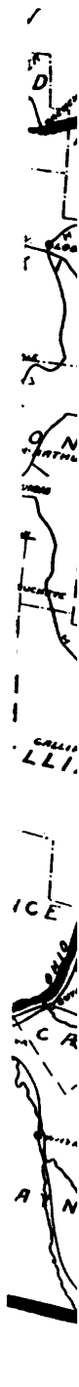
When water was at its highest; Pennsylvania Lines employees on concrete piers for new bridge being erected in connection with track elevation work, doing what they can to rescue people floating down against bridge. View east on north side of bridge.

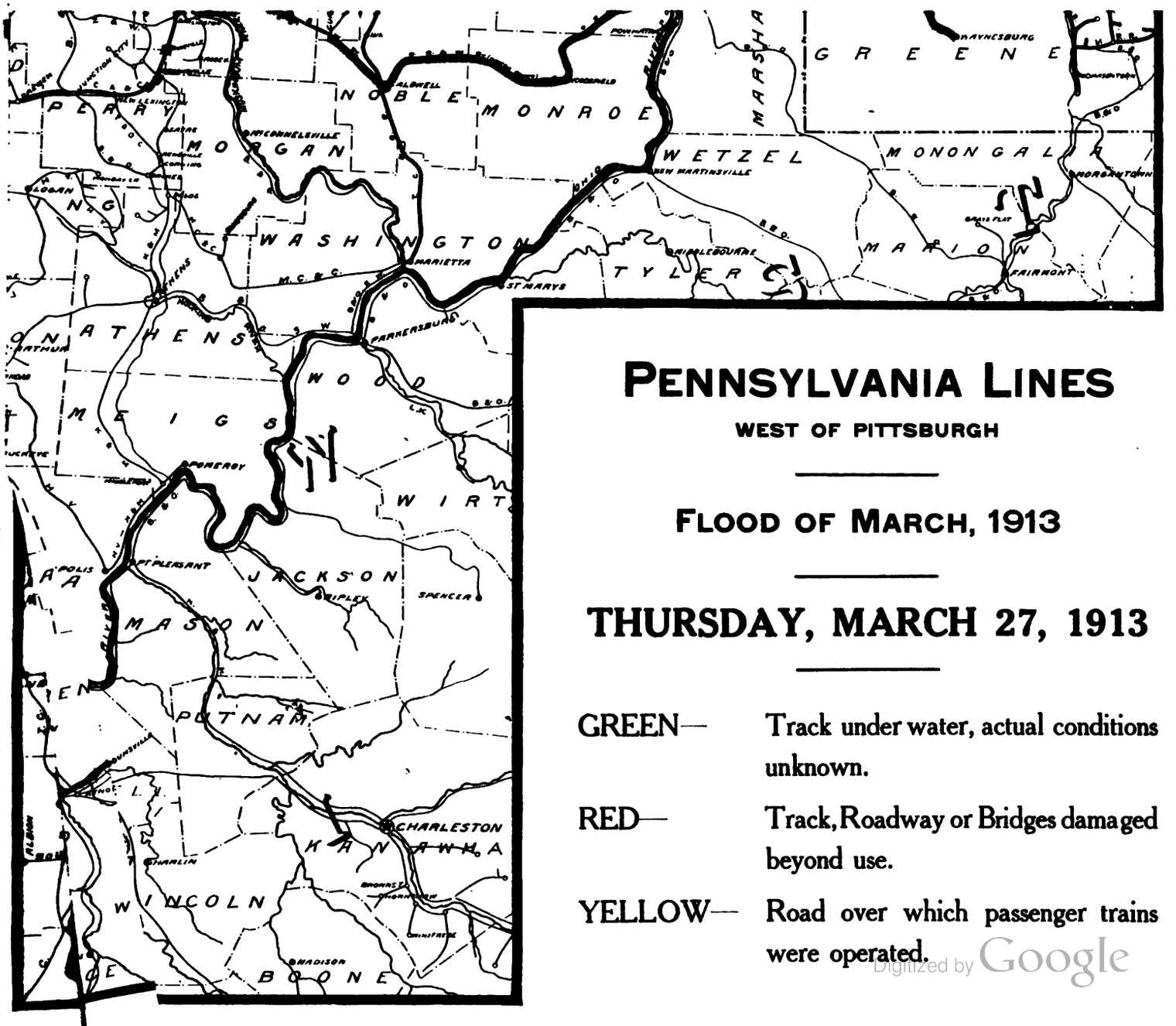
Dayton, Ohio. March 25, 1913.

Fourth and Main Streets. Depth of water indicated by lamps on curb-posts, which were nearly all swept away.

Dayton, Ohio. March 25, 1913.

Second Street, between Main and Ludlow, before crest of flood was reached.





PENNSYLVANIA LINES

WEST OF PITTSBURGH

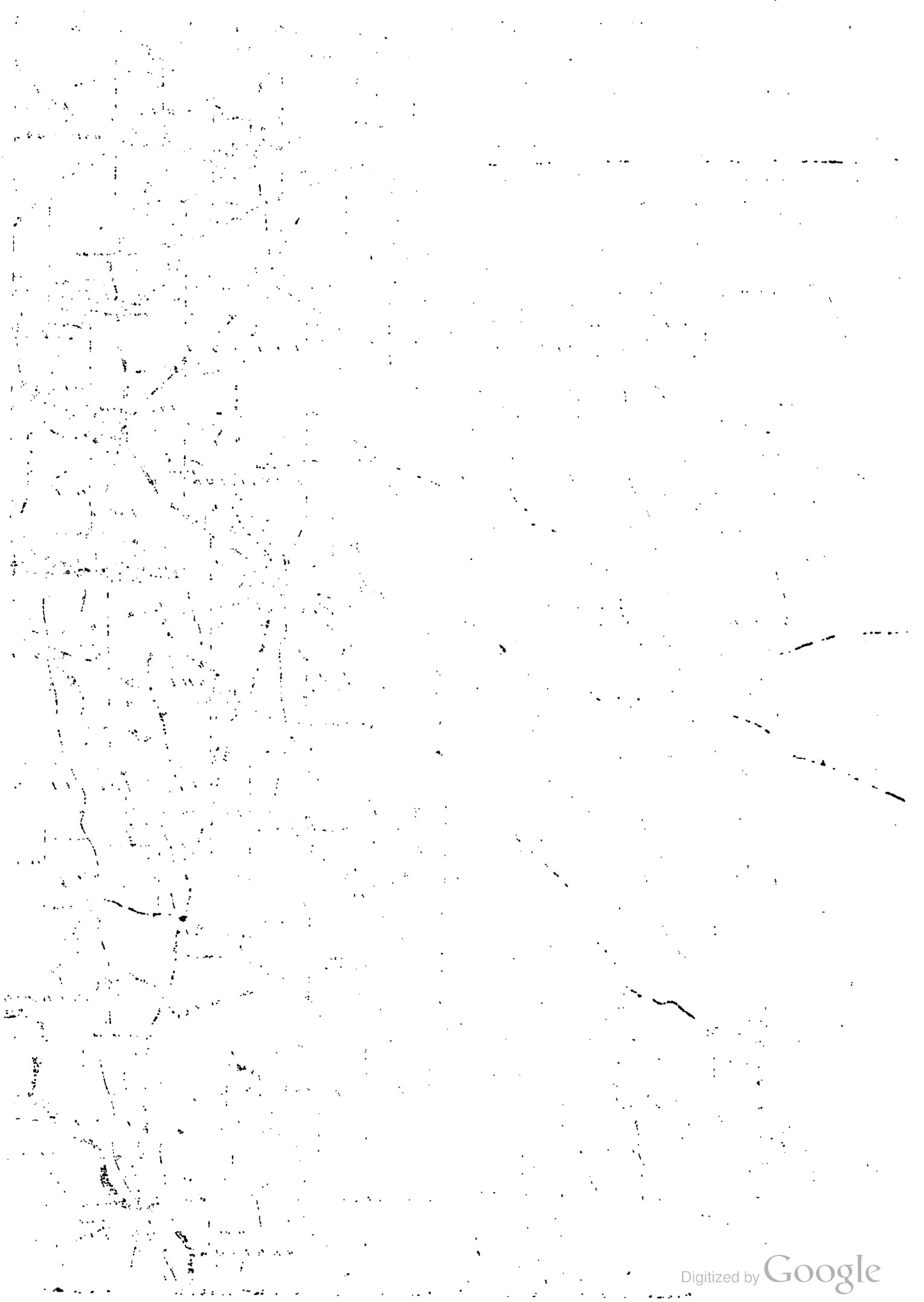
FLOOD OF MARCH, 1913

THURSDAY, MARCH 27, 1913

GREEN— Track under water, actual conditions unknown.

RED— Track, Roadway or Bridges damaged beyond use.

YELLOW— Road over which passenger trains were operated.



CHAPTER 11.

APRIL 3, 4, and 5, 1913.

On Thursday, the third, at 11:15 A. M. the main line of the Ft. Wayne road was opened for traffic, with one track, the first train over being No. 6, ten days having elapsed since the line was broken. With the opening of this line, full passenger service between Pittsburgh and Chicago was resumed via the Ft. Wayne road, putting an end (temporarily, however) to the detour service via the Lake Shore and Erie roads.

The river at Cincinnati had gone down enough to permit clearing up the passenger station and yard. At Louisville, the New Albany Branch fill was not yet out of danger, but the water had begun to fall.

The Marietta Division Bridge over the Tuscarawas River at New Comerstown was put in service in the afternoon, opening the main line of that Division throughout.

Freight traffic for points on the Vandalia from Terre Haute west was handled via Columbia City on the Ft. Wayne road and between that point and Terre Haute on the Vandalia line.

All day Thursday it rained through Central and Western Ohio and Eastern Indiana over about the belt of the previous greatest rainfall, and on Thursday night it rained very hard at many places for several hours. This brought the streams up again rapidly and greatly retarded repair work.

On Friday morning, about five o'clock, one abutment of Eastern Division bridge No. 144 over Black Fork, just west of Coulter, Ohio, sank, again interrupting service on the Ft. Wayne road until it could be repaired, which took twenty-four hours. As arrangements had been made for full service, the trains were allowed to come through, and again the two detour routes had to be resorted to until the morning of the 5th, when they were permanently discontinued.

The Indianapolis Division bridge over the East Fork of the White River, west of New Paris, Ohio, was also again put out of service by the undermining of the pier and the washing away of the timber bents which had been constructed to support the steel work. This made it necessary to send all through business by the G. R. & I. route and Ft. Wayne for about twenty-four hours.

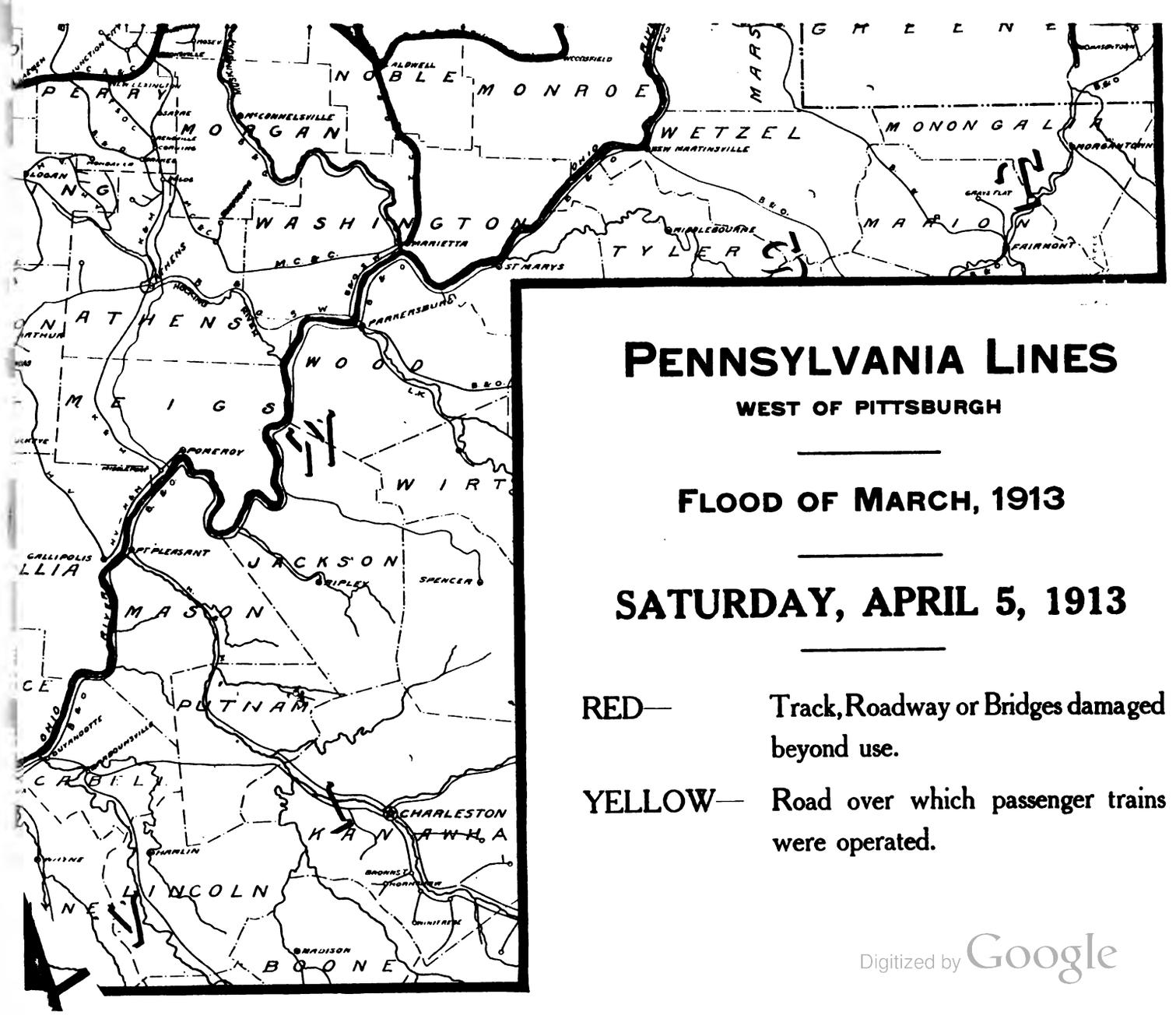
On the afternoon of Friday, April 4th, the Akron Division from Columbus to Orrville was opened for service. This provided a much shorter detour route for Pan Handle business between Columbus and Pittsburgh, although it was a very inadequate one, being a single track road with many slow orders. It was at once arranged to resume full passenger service. It was later found necessary to take off Nos. 30 and 31 for a time, but otherwise full passenger service between Pittsburgh and St. Louis was re-established on the 4th, all tickets being sold subject to delay, however.

In the evening of the fourth, the Vincennes Division of the Vandalia was opened up, discontinuing a detour from Greencastle to Gosport Junction, over the C. I. & L., which had been used for several days.

The Zanesville Division was also opened from Putnam (South Zanesville) to Morrow, and by borrowing a B. & O. wrecking derrick it was found possible to clear much of the wreckage and debris from the yard tracks in Zanesville. On the fifth the W. & L. E. put their tracks in such shape between Ellis and Zanesville that it was possible to resume passenger service between Trinway and Zanesville by using Zanesville Division to Ellis and the W. & L. E. from there to North Zanesville.

It was suggested on the 5th that the two detour routes from Columbus, Ohio, to Pittsburgh, one via the Sandusky Branch to Bucyrus, and the other via the Akron Division to Orrville, be used as double-track, business in one direction only being sent over either route. This was accordingly arranged, commencing on Sunday night the 6th—the east bound trains taking the route via the Sandusky Branch, and the westbound the Akron Division route. It was found necessary for the eastbound passenger trains to go to Carrothers on the Sandusky Branch, thence to Toledo Jct. via the Toledo Division main line, and east from there over the Ft. Wayne road; as it was impossible to deliver them to the Ft. Wayne at Bucyrus headed right, for lack of a "Y" connection for east bound trains, which local conditions make it impracticable to construct.

On Saturday, the 5th, train service into and out of the Cincinnati Union passenger station was again resumed, commencing with No. 6.



PENNSYLVANIA LINES

WEST OF PITTSBURGH

FLOOD OF MARCH, 1913

SATURDAY, APRIL 5, 1913

RED— Track, Roadway or Bridges damaged beyond use.

YELLOW— Road over which passenger trains were operated.

CHAPTER 12.

APRIL 6 TO APRIL 12, 1913.

Sunday, the 6th, was clear again, and the delays due to high water and the discomfort due to the rain were forgotten. In each of the reconstruction camps, all energy was directed toward restoring the broken lines. In the general offices all energy was directed toward restoring passenger and freight service as conditions would permit.

At 9:30 A. M. a second main track was put into service over Bridge 139, Loudonville, giving the Eastern Division two main tracks throughout.

At midnight the arrangement mentioned as having been made on the 5th for routing Pan Handle business eastbound from Columbus via the Sandusky Branch, and westbound from Pittsburgh via the Akron Division, was put in effect.

Monday, the 7th, was clear and colder, with the streams below flood stage at nearly all points.

The Pittsburgh Division was opened from Dennison to Coshocton, with speed restrictions at points where washouts had been repaired. This left the gap in the Pan Handle road but the fourteen miles from Coshocton to Trinway, but conditions there were such as to require at least another week's work before it could be opened. The Richmond Division was opened from Camden to Somerville, but this left a gap of fourteen miles, from Somerville to Hamilton, which it was estimated would require nearly a week to close.

As the trestles put in at the numerous washouts had been built as rapidly as possible, and many of them were to be used for months by trains of heavy power and cars and of considerable length, arrangements were made to have these trestles all specially inspected to make certain that they were adequate, and to follow this up by weekly inspections during the time they were in use.

Tuesday morning, April 8th, found the bridge over the Scioto River, at Marblecliff, again in service, and during the night the trestling of the Miami River at Dayton was completed for one track. This permitted the running of all trains between Columbus and St. Louis by their normal routes.

Rain on the 9th again interfered with the work at several points, particularly on the Richmond and Louisville Divisions, and at Muncie.

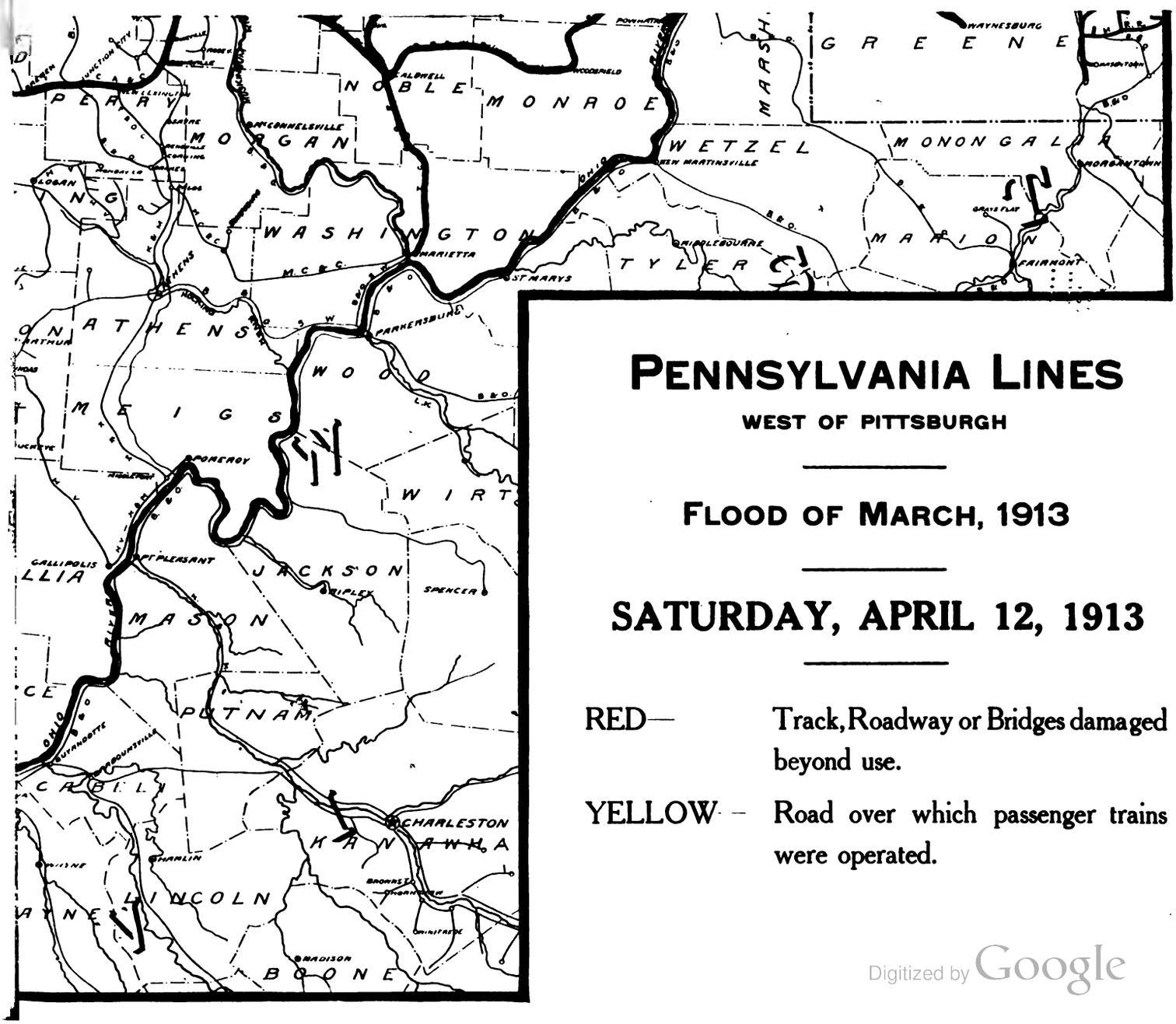
On the 10th the Richmond Division was opened for service except between Collinsville and Seven Mile, three and a half miles. The White River Bridge at Muncie was replaced with temporary trestle, and service to Muncie passenger station resumed. It continued to rain all day, in eastern Indiana and Ohio, and the consequent rise in the rivers again seriously delayed the repair work everywhere.

On Friday, April 11th, the weather was again clear, and the fear of another flood and the wiping out of all the temporary bridges and new fills was removed.

Saturday, April 12th, saw the Richmond and Louisville Divisions opened throughout and service from Chicago to Cincinnati and Louisville resumed via normal routes.

During the night the Pittsburgh Division was opened by the completion of the trestling for one track at Bridge 100, over the Muskingum River, which was put in service early Sunday morning, the 13th.

This opened up all the main routes and closed all gaps in tracks except on the Zanesville Division and Walhonding and Dresden Branches, in the valley of the Muskingum and its tributaries, as shown on the map for the 12th.



PENNSYLVANIA LINES

WEST OF PITTSBURGH

FLOOD OF MARCH, 1913

SATURDAY, APRIL 12, 1913

RED— Track, Roadway or Bridges damaged beyond use.

YELLOW — Road over which passenger trains were operated.

CHAPTER 13.

SUBSEQUENT TO APRIL 12, 1913.

With the opening of the Pittsburgh Division on the morning of Sunday, April 13th, the main line routes were all in service, a few hours over eighteen days from the destruction of Bridge 100, and the closing of the routes between Pittsburgh and the west. The repair gangs were still engaged in providing second track through several places where but one track had been rebuilt on the main lines, and in rebuilding the Zanesville Division bridges over the Muskingum at Ellis and Zanesville, and the Walhonding and Dresden Branches in the valleys of the tributaries of the same stream.

On the 19th the derrick car at work on the Zanesville bridge was upset while handling a girder, but it lodged against some flat cars on an adjacent siding and no particular damage was done. On the 1st of May, the pile driver working on the bridge at Ellis was precipitated into the river by the failure of one of the trestle bents it had just driven. Its place was taken by another driver.

On April 22d the Walhonding Branch of the Marietta Division, from Coshocton to South Loudonville, was opened for service, and on Sunday the 27th the Dresden Branch of the Akron Division, from Killbuck to Trinway, was restored to service.

On May 7th, the Muskingum River Bridge at Zanesville was reopened for service with a temporary structure, and on May 12th the Ellis Bridge was completed and put in service. Forty-eight days after the flood the last link in the chain was closed and service to all points on the Pennsylvania Lines West of Pittsburgh had been resumed by normal routes.

CHAPTER 14.

EASTERN DIVISION.

The Eastern Division, from Alliance west, lies in the zone of greatest rainfall, and while high water was experienced over the whole of the Division, the serious damage done was confined to the district between Lakeville and Lucas, Ohio, where the tracks occupy the valleys of the Jerome Fork of the Mohican River and the Black Fork and its tributary, Rocky Fork. These streams, uniting, form the Mohican River, which, uniting with the Kokosing River, forms the headwaters of the Walhonding River, which in turn, uniting with the Tuscarawas, forms the Muskingum; and wherever a railroad crossed or paralleled any of these streams it was practically destroyed.

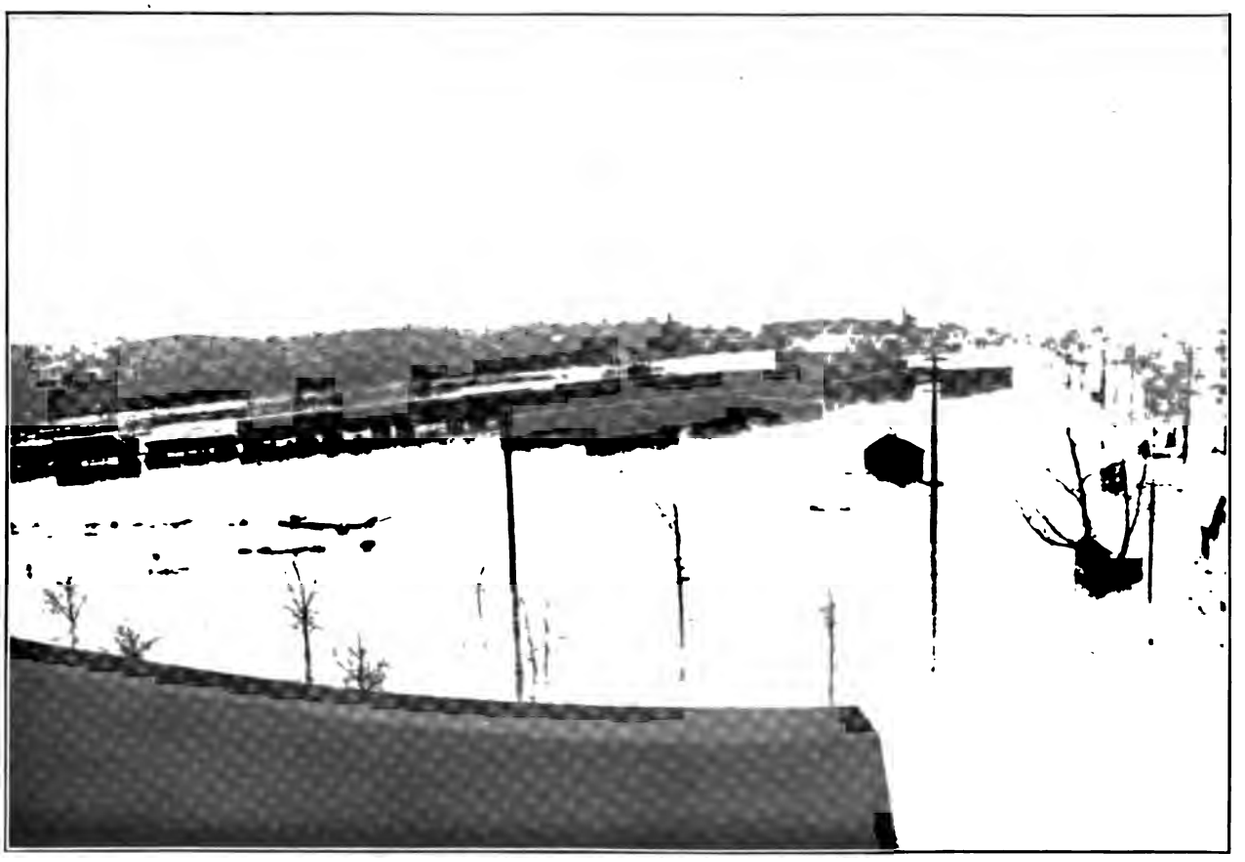
On Monday evening, March 24th, word was received that one track had been undermined at Bridge No. 149, at Lucas, a stone arch, one wing wall of which had been destroyed. Work trains and men were immediately sent there to replace the damaged fill. Two hours later word was received that both tracks were washed out, twenty-five feet deep, a distance of 60 feet, at a point about a mile and a quarter east of Bridge No. 149. Work trains and a wreck train were started west to this point, but could get no nearer than Wooster on account of the depth of water over the tracks west of there.

Passenger trains were therefore detoured over the Big Four to Columbus and the Pan Handle to Pittsburgh, and *vice versa*. Freight traffic was stopped. Additional reports came in rapidly of high water and serious damage at numbers of places, and all available men, material and supplies were assembled and started towards the scene of damage. Four pile drivers were secured, two of which were sent to each end of the damaged section of the road.

About 1:00 A. M. on the 25th, Bridge No. 146, a 79 foot deck truss bridge over Rocky Fork, east of Lucas, was washed out; the masonry and superstructure being destroyed and the embankment on each side washed out, leaving a gap over three hundred feet long.

A little later, one track was washed out at the west side of Bridge No. 147, a fifty foot stone arch over the same stream, about two miles further west. By dumping bridge seats and other heavy stone into the hole, the water was prevented from undermining the second track.

Bridge No. 145, a double span 65 foot deck girder bridge, was totally destroyed. The bridge is located just below where Rocky Fork empties into Black Fork, and their united streams cut a hole about sixteen feet below the normal bed of the stream, undermining the pier and both abutments of the bridge. On both sides of Bridge No. 144 the tracks were undermined, leaving holes twenty to thirty feet long back of the abutments. At Bridge No. 141, a house lodged against the east abutment, causing an eddy which undermined the abutment and washed a hole sixty feet in length. This was a double span 96 foot deck girder bridge, and the east end of the east span settled when the



Mansfield, Ohio. March 25, 1913.
Yard tracks opposite Union Station building, which stands just at right of interlocking tower appearing at right of picture. These tracks are used for interchange with Erie R. R.

Lucas, Ohio, east of. March 26, 1913.
Bridge No. 146, over Rocky Fork, both abutments and about 125 feet of embankment approach destroyed.

Lucas, Ohio, east of. March 26, 1913.

Landslide at M. P. 167, after No. 1 track had been cleared.

Coulter, Ohio, west of. March 30, 1913.

Bridge 145, over Black Fork, before any work had been done except construct a plank walkway and hand railing along one track.

abutment failed. Bridge No. 139, a double stone arch of 16 and 24 foot spans, was destroyed completely, and the twenty-five foot fill on each side washed out, leaving a gap seven hundred and fifty feet long.

All day long the water was too high to permit the work trains to get nearer the damaged bridge than Wooster. By daylight of the 26th, however, the water had gone down enough to start work westwardly through the district damaged by Killbuck Creek, between Wooster and Millbrook. At several points it was necessary to drive piling, as the current through the openings was too swift for anything else to hold against it.

From the west end, a driver started work at 10 A. M. (on the 26th) at the west end of Bridge No. 146, and made good headway during the day.

During the night the rain turned to sleet, and by daybreak it was very cold. The work trains which had been working between Wooster and Millbrook proceeded to Lakeville, and during the day of the 27th, drove piling on each side of Bridge No. 132 and repaired a gap of about 2,000 feet where the track was entirely washed out west of this bridge, and by evening were able to proceed to Bridge No. 136, where the railroad crosses Jerome Fork. A large force of trackmen and shopmen were engaged in filling up the damaged tracks west of Wooster. Another pile driver arrived at Lucas and was put to work at Bridge No. 147, a fifty foot stone arch over Rocky Fork, the west approach to which was so badly washed that it was necessary to build 42 feet of trestle to span the break. Considerable difficulty was encountered on account of the stone from a destroyed wing wall being left where the piling was to be driven. At Bridge No. 146, it was found necessary to build run-arounds to clear the old structure, requiring trestle 350 feet long for each track.

A Pennsylvania Railroad pile driver arrived at Lakeville on the evening of the 27th, and it was desired to use this instead of the driver then at work at Bridge No. 136, as it was equipped with a steam hammer for more rapid work. In bringing it up to position, however, it was overturned through the straightening of a guy-rope hook due to the strain caused by the unusual superelevation of the track on a curve. The foreman of the outfit was killed and an engineer severely injured and the pile driver was so damaged that it had to be returned to the shop for repairs. The work proceeded with the old driver after the wreckage was cleared up.

By this time the Ohio River had gotten very high at the eastern end of the Division, and some tracks at Conway were under water and No. 4 track, nearest the river, was put out of service on account of the embankment being badly washed. Landslides at Glenfield and West Rochester also required attention.

On Friday, March 28th, trestle for one track having been completed at Bridge No. 136, the pile driver proceeded to Loudonville, and started work at Bridge No. 139, where a gap 750 feet long was to be trestled or filled. The Division gangs were reinforced with men from the Pennsylvania Railroad and Cumberland Valley Railway, the latter road furnishing also a portable electric light plant, so that arc lamps could be placed across the gap to facilitate night work.

At the west end of the work, the division forces had been supplemented with gangs from the Western, Chicago Terminal, and Cleveland & Pittsburgh Divisions and some contractors' men. One track having been provided at Bridge No. 147, the driver advanced to Bridge No. 146.

On Saturday, the 29th, the work of repairing the washed tracks at Wooster and Lakeville continued; the old pile driver at work at Bridge No. 139 was replaced with a new and better one, and work proceeded rapidly there; one track was completed across the gap at Bridge No. 146 at midnight, and the pile driver immediately moved eastwardly to Bridge No. 145.

On Sunday, the 30th, the approaches to Bridge No. 144 were filled with coal and screenings which were on the passing track near by. Bridge No. 143 was in course of reconstruction before the flood, and was supported on temporary timbers which the water took away. These supports were replaced and the approaches at both sides, which had been damaged for several hundred feet, repaired with screenings. At Bridge No. 145, it was also necessary to drive run-around trestles to avoid the old structure, each about three hundred feet long. A driver was started at work on a second track at Bridge No. 146, and made good progress.

On Monday, March 31st, the work continued at the same points. A force of men was sent to Bridge No. 141 to start work of erecting frame bents under the east approach, so that when a pile driver could be sent there work could be immediately started on the bridge.

Tuesday, April 1st, saw trestle for one track nearly completed at Bridge No. 139, and entirely so at Bridge No. 145. On the 2nd the trestle was completed at Bridge No. 139, and the pile driver advanced to Bridge No. 141. Trains of filling material were then brought to Bridge No. 139 to fill the trestle and widen the embankment for a second track so that the second trestle need not be built for the whole distance.

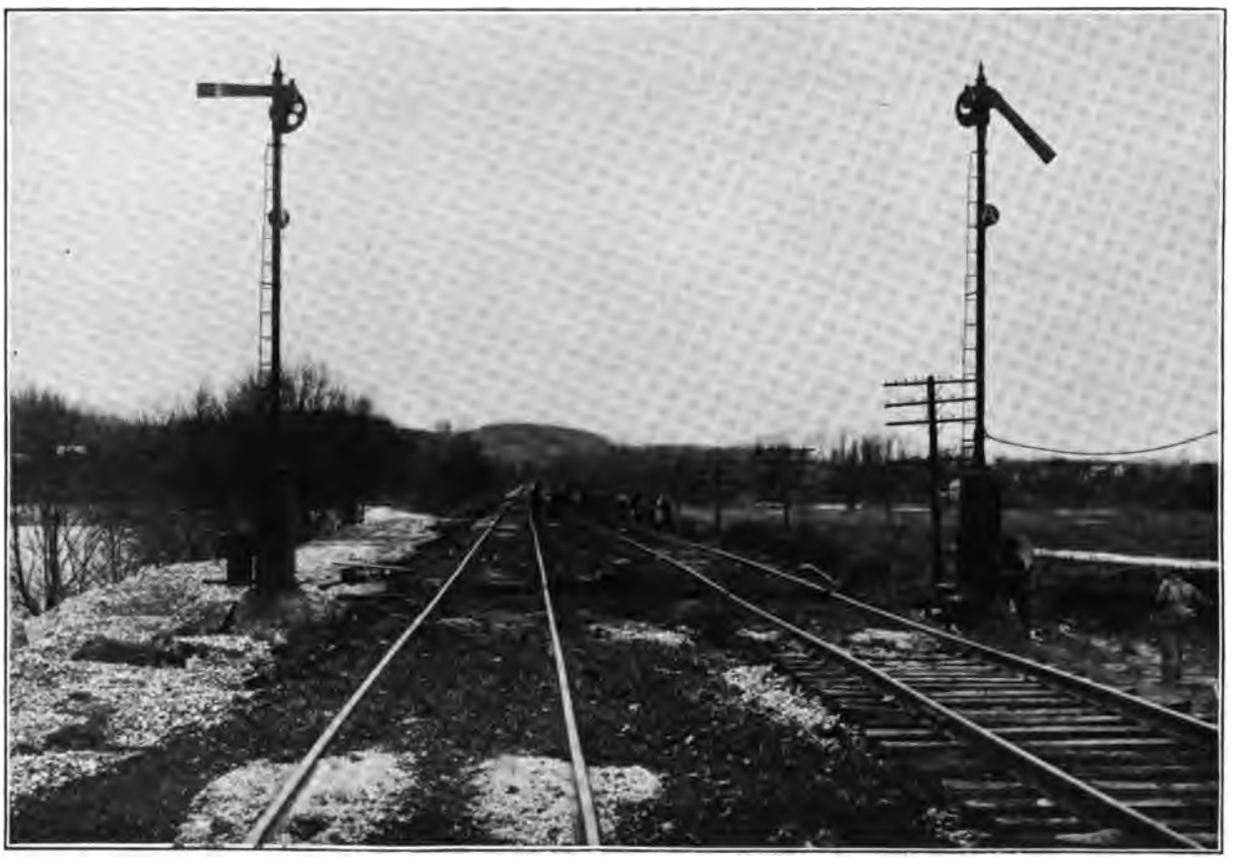
On Thursday, April 3rd, Bridge No. 141 was supported by piling, which opened up one track through the entire flood district. Passenger service was at once resumed, and in addition to the usual trains, the trains of the Southwest System were brought to and from Pittsburgh by this route.

At 4:00 A. M., April 4th, the east abutment of Bridge No. 144 failed, settling about one foot and moving out about one foot. The east end of the bridge was jacked up and blocked, and stone dumped in front of the abutment to support it. This blocked the Division again for about twenty-four hours.

By Sunday morning, April 6th, second track had been provided at all the bridges, and the commissary trains, pile drivers and crews were sent to the Pittsburgh and Marietta Divisions, which were still out of service.

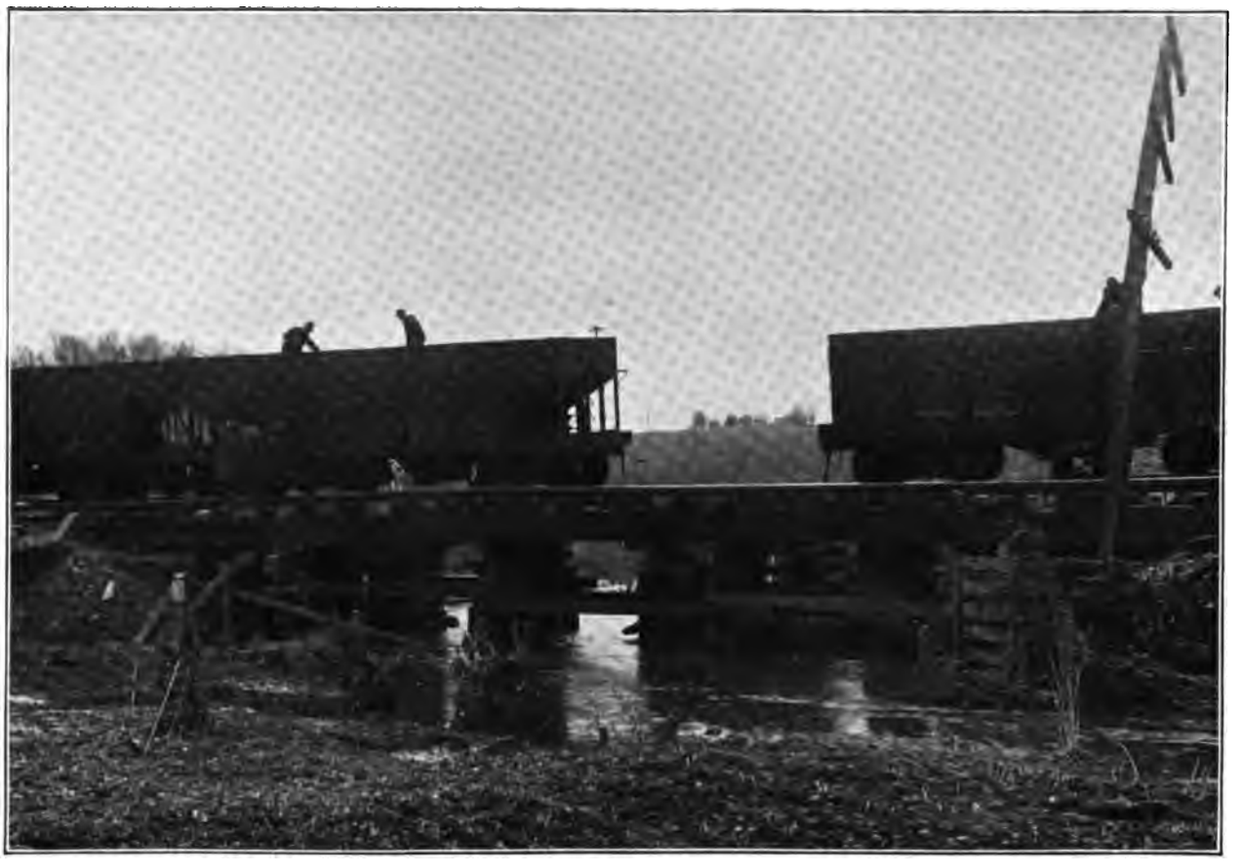
The work done in repairing the damage on the Eastern Division may be summarized as follows:

Location	Length of Trestle Built (Total for Two Tracks)	Number of Piling Driven	Frame Bents Constructed	Cars of Filling Material Used
East of Wooster...	.....	.....	.....	20
West of Wooster..	40 feet	16	.....	100
Lakeville.....	30 feet	12	.....	200
Bridge No. 136....	136 feet	46	.....	.....
Bridge No. 139....	822 feet	254	15	400
Bridge No. 141....	219 feet	68	14	.....
Bridge No. 143....	.....	.....	.....	10
Bridge No. 144....	.....	.....	.....	37
Bridge No. 145....	581 feet	259	3	.....
Bridge No. 146....	700 feet	291	3	10
Bridge No. 147....	42 feet	16	.....	.....
M. P. 167.....	.....	.....	.....	50
Bridge No. 149....	.....	.....	.....	10
Total.....	2,570 feet	962	35	837



Lakeville, Ohio, west of. March 31, 1913.

Repairing tracks at washout at M. P. 153.
Water had been 5 feet 9 inches above top of rail.



Loudonville, Ohio, east of. March 31, 1913.

Bridge No. 136, over Plum Run, arch washed out, with about 50 feet of embankment. Tracks supported on cribbing.

Loudonville, Ohio, west of. March 31, 1913.

Bridge 139, over road and mill race, and 750 feet of embankment, washed away. Temporary trestle about half completed for one track.

Loudonville, Ohio, west of. April 2, 1913.

Bridge No. 139, over road and mill race; temporary trestle for one track completed, and about ready for service—looking west.

Loudonville, Ohio, west of. April 1, 1913.

Bridge No. 139, over road and mill race; temporary trestle for one track about completed. Looking east.

Loudonville, Ohio, west of June 27, 1913.
Bridge No. 139, from rear of passenger train No. 19.

Perrysville, Ohio. March 31, 1913.
Bridge No. 141, over Black Fork. East abutment and about 100 feet of approach embankment destroyed.

Perrysville, Ohio. March 31, 1913.

Bridge 141, over Black Fork, showing east approach and abutment destroyed.

Perrysville, Ohio, west of. March 31, 1913.

Looking west over Bridge 143, over Black Fork, showing fill washed away and replaced for service.

Perrysville, Ohio, west of. March 31, 1913.

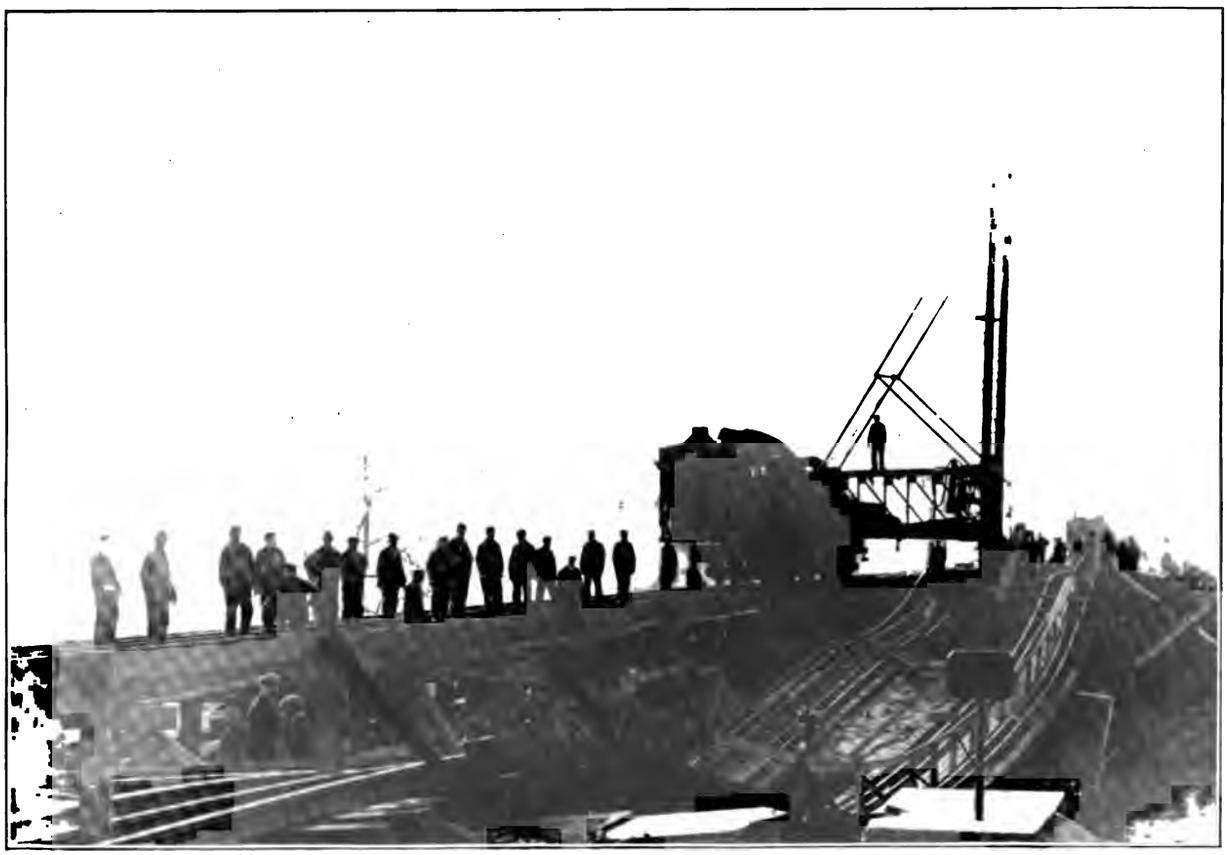
Bridge over Black Fork, No. 143, intact, but west abutment for a new bridge to replace this one was destroyed.

Coulter, Ohio, west of. March 31, 1913.

Bridge No. 144, over Black Fork. Replacing approach, which had been washed out for about 75 feet.

Lucas, Ohio, east of. March 31, 1913.

Bridge No. 145, over Black Fork; pier and both abutments and 100 feet of approach destroyed. Pile driver starting repair work at west side.



Lucas, Ohio, east of. April 1, 1913.

Bridge No. 145, over Black Fork, from east end, showing break in abutment as well as general condition of bridge. One "run-around" track about completed.

Lucas, Ohio, east of June 27, 1913.

Bridge No. 145, view from the rear of passenger train No. 19, showing "run-around" tracks on temporary trestles.

Lucas, Ohio, east of. March 31, 1913.

Bridge No. 146, over Rocky Fork; both abutments and 125 feet of roadbed destroyed.

Lucas, Ohio, east of. March 31, 1913.

Looking south at Bridge 146, over Rocky Fork, showing temporary trestle back of bridge destroyed.

Lucas, Ohio, east of June 27, 1913.

Bridge No. 146, view from rear of passenger train No. 19, showing "run-around" tracks on temporary trestles.

Lucas, Ohio, east of. March 31, 1913.

Bridge No. 147, over Rocky Fork; approach washed out for 50 feet, bridge uninjured, but wing wall destroyed.

Lucas, Ohio. March 31, 1913.

Bridge 149, southwest wing wall destroyed. Fill at west side replaced ready for service.

CHAPTER 15.
WESTERN DIVISION.

The Western Division suffered damage only in western Ohio. It there traverses comparatively level country in which the water found plenty of room to spread out. While the rainfall was heavy through all this district, and the eastern end of the Division lies within the belt of greatest rainfall, the only point where conditions were such as to interfere with traffic was just east of Delphos, where two insignificant creeks, flowing under the tracks toward the Auglaize River, found Bridges, or culverts rather, 182 and 183, too small for their accommodation.

Culvert 182, about one third of a mile west of Auglaize, was originally a 16 foot bridge, but in 1895 it was filled in, except for a twenty-four inch cast iron pipe which was placed in the bottom of the opening. This waterway was two small for the March flood, and when the water broke through the fill, it washed away about 120 feet of the embankment. For part of the distance it was necessary to trestle over the opening and this trestle will be replaced with a bridge of the original span.

Culvert 183, about one mile west of Auglaize, was a six foot stone arch, of which the east side under the older track was destroyed, and with it about forty lineal feet of embankment. The damaged arch was rebuilt in concrete.

Both of these openings were trestled for single track by six o'clock on the morning of the 27th of March, and the Western Division was ready for service. As the through passenger trains were being detoured via the Lake Shore, and no route was open for moving freight, nothing but local service was performed until the opening of the Erie detour route on the following day, and then only a very limited service for a week or more.

At Fort Wayne the St. Mary's River threatened damage, but did no more than flood a pump house. This was foreseen in time to provide a temporary pumping plant on high ground, and caused no delay to traffic.

An orphanage in the river valley was flooded, and four of the children drowned in attempts to get them out with ordinary row boats. To rescue the seventy orphans and caretakers, arrangements were made through the Chicago Terminal Division officers to send a life saving crew from Chicago to Fort Wayne by special train. Within an hour after its arrival at Fort Wayne, all who had been marooned in the building were safely landed on high ground.

Outside of the damage to telegraph lines by wind and sleet the Chicago Terminal Division was not affected by the flood.

Auglaize, Ohio, west of. March 26, 1913.

Western Division Bridge 182, view looking east, 8:00 A. M. Abutment of former bridge at left of track. This bridge was filled in in 1895, after a 24″ C. I. pipe had been placed.

Auglaize, Ohio, west of. March 26, 1913.

Bridge 183, six foot arch damaged, and approach washed away.

CHAPTER 16.

CLEVELAND AND PITTSBURGH DIVISION.

The C. & P. Division main line, from Alliance to Cleveland, was not out of service except for about three hours on the 25th, and was used as a detour route for all the Pittsburgh-Chicago and general western business during the entire flood period.

The main line along the Ohio River and the various branches, however, did not fare so well. Service was first interrupted on the Tuscarawas Branch, by a landslide near Zoar, on the 25th of March. This had not been cleared, when the Tuscarawas River covered the Branch for five or six miles. After the water went down, work was resumed, and a track made ready for service around the slide on the 29th, and service on the Branch resumed. Similar landslides occurred at many points on the Division on the 25th and 26th, but it was managed to keep the rest of the road open for operation until the Ohio River overflowed the tracks all along its valley on the night of the 26th and on the 27th.

As the river went down, it was found that comparatively little damage had been done, and tracks were repaired for service without much delay. At Brilliant, two bents of a trestle had been carried away, with considerable fill. A pile driver could not be had; a land driver mounted on a flat car was tried ineffectually, and finally a pile driver was improvised of a locomotive crane and a steam hammer. This answered the purpose, but it worked slowly, and the break was not cleared until the afternoon of April 2d.

In the meantime, the balance of the Division had been put in fair shape, and service was resumed throughout.

While the Ohio River submerged the tracks, and the Cleveland-Pittsburgh trains were all routed via the Eastern Division, shuttle service was performed between Alliance and Wellsville, and between Yellow Creek and Mingo Junction.

At Steubenville the Ohio rose 10.4 feet over the tracks of the C. & P. Division, at Mingo Junction 6.7 feet, at Bellaire 9.8 feet, and at Powhatan 12.0 feet. At intermediate points the tracks were not submerged so far, and at many points they were above the highest stage, but over most of the River Division there was a thick deposit of mud, slime and debris. Some idea of the conditions during the period of high water can be had from the photographs shown in chapters 4 and 5.

Zoar, Ohio, west of. March 31, 1913.

Land slide at Eagle Hill, Tuscarawas Branch.

CHAPTER 17.

ERIE AND ASHTABULA DIVISION.

The E. & A. Division, situated in the valleys of the Beaver, Mahoning and Shenango Rivers, on the south of the divide between the basins of the Ohio River and the Great Lakes, was pretty well submerged, but as this is a district in which floods may be expected at any time, the track construction is such that little damage was done. In fact, the only point where the line was really broken was Bridge 68, on the New Castle Branch, over the Shenango River, which was destroyed.

On March 25th, the tracks were under water at Niles and Warren early in the morning, six and seven feet respectively. These are the low spots where high water first interrupts service at every flood. At numerous other points the water was up to or over the tracks, and traffic was stopped.

On the 26th and 27th, the water rose to heights far above all previous records and submerged everything in the valleys, from Kenwood to Warren and Jamestown. An idea of the height of the water may be gained from the photographs included in chapters 3, 4 and 5, the maximum depth over the tracks being 18.8 feet. On the morning of the 27th an old covered wagon bridge, up stream from Bridge 68, floated down stream and lodged against the railroad bridge. This choked the stream until the water, in forcing its way underneath, undermined the piers of Bridge 68, and let it down into the water, with a load of cars which had been placed on it to hold the track in position. This did not interrupt traffic, as a roundabout route was available over which trains could be run with slight delay. The bridge was replaced with a temporary pile trestle, completed on May 2d. Later the girders were raised and will be used in rebuilding permanently.

As fast as the water went down, service was resumed, and on the night of March 29th, the entire Division was restored to service, all schedules being filled normally on the 31st. The yards and enginehouses were covered with mud, slime and debris, however, and the task of cleaning up took weeks of work.

Mahoningtown, Pa. March 27, 1913.

View of shop and engine yard, 2:00 p. m., from roof of enginehouse, looking north.

New Castle, Pa. March 29, 1913.

"Franklin" Bridge No. 68, over Shenango River, showing position of girders and cars after water had receded.

CHAPTER 18.

PITTSBURGH DIVISION.

The Pittsburgh Division, while not itself lying in the belt of greatest rainfall, is located in the valleys of the Muskingum and its tributaries, the Tuscarawas River and Wakatomika Creek, from Dennison westwardly fifty-four miles to Black Run. The railroad lies low in the valleys, and is crossed and recrossed by these streams. Just south of Trinway, where Wakatomika Creek joins the river, the Muskingum turns abruptly south through a narrow pass in the hill forming the southern limit of the broad glacial valley, or flood plain, of the streams uniting there. The quantity of water brought to this narrow pass by these streams exceeded its capacity, and the excess accumulated in the valley until its height far exceeded all previous records. For many miles this valley became practically a lake, not exactly of back water, but moving toward the outlet in the main stream, with sluggish back water in the overflowed territory on either side, all full of buildings, trees, animals, crossties and all sorts of debris. The tracks of the Pittsburgh Division were under water for most of this distance, and as the water was always higher on one side of the tracks than the other, the fill acted as a dam, with sluiceways where there were culverts. At these culverts the water usually succeeded in cutting out the embankment on either side, and the fill being once broken it was quickly destroyed, often for long distances, the track being washed away and twisted beyond any possibility of replacement except by completely rebuilding it.

On Monday evening, March 24th, the Eastern Division having been washed out at Lucas, and all day on the 25th, the Northwest System passenger trains were handled between Columbus and Pittsburgh, together with the regular schedules. By Tuesday evening, March 25th, the streams got so high from the heavy rainfall above that they began to do serious damage on the Pittsburgh Division. Passenger trains were annulled west of Dennison and arrangements made for detouring through trains via some route north of the flooded district.

The first actual break in the line was at Bridge 101, a stone cattle-pass east of Conesville, where the water washed away the fill all around the stonework, and destroyed most of the bridge. This occurred about nine-thirty o'clock in the evening, and a track walker who discovered the washout, while enroute to Bridge No. 100, over the Muskingum River, about a mile east of there, flagged a Big Four passenger train being detoured from Columbus to Pittsburgh, stopping them clear of the damaged track. The train was returned to Columbus.

At 10:15 P. M., Bridge 100, over the Muskingum, was washed away at the west end, two spans going into the river, and the Division was effectually put out of service. Later Bridge 104 went out, and the roadbed was destroyed at numerous places between Black Run and Tuscarawas, fifty miles.

For a few hours, water covered the tracks at Collier and west of there in the valley of Harmon Creek where a flood in the previous September had wrought wholesale destruction, but went down without doing any considerable damage.

On Wednesday the 26th, the streams continued to rise, and every hour of the day brought reports of further damage. During the night, the telegraph lines were put out of commission between Coshocton and Newark, and reports of conditions there ceased.

Only three trains had been marooned on the Division, No. 74, a local passenger train, at Trinway; a mixed local, on the Franklin Branch, at Tyndall; and a work train at Gnadenhutten. Neither of these trains was damaged. The telegraph operator at "DG" Tower, west of Port Washington, was marooned in his tower.

On the morning of the 27th an attempt was made to start repairs at the east end of the section where the greatest damage had occurred, by filling in a washout at Romig's crossing, just west of Tuscarawas, but on account of the force of the current through the break it was impossible to make any headway. The worktrain returned to Dennison and was utilized at other points to put things in better shape and a pile driver outfit sent there instead. A pile driver at the west end of the damaged section was useless for lack of material, but arrangements were made for the cutting of piling in the surrounding country, and such repair work as could be done without piling was proceeded with. In the afternoon, the pile driver arrived at Romig's crossing, and the work of piling across the break was commenced, and completed before night.

A motor boat was secured at Dennison, brought to Romig's crossing by train, and started down the river with an engineer and others to ascertain exact conditions, material needed for repairs, etc. They reported on Thursday the 27th serious damage all along the line as far as they were able to get,—they had to lay over for the night at Gnadenhutten, and they were not heard from again until Sunday the 30th, when they arrived at Coshocton.

On Friday the 28th, very little repair work could be accomplished, owing to the high water everywhere, but on the 29th, the water went down enough to permit inspection of conditions over a good part of the Division.

At Bridge 100, over the Muskingum River, at Tyndall, it was definitely ascertained that the two west spans had been swept clear away, the west pier having disappeared. The center pier had been undermined on the north, or up-stream side, so that the northwest corner of one span had dropped some six feet. The remaining span, at the east end, was in place and apparently undamaged. East of the bridge, for several hundred feet, the embankment had held, but for nearly half a mile east of this piece of undamaged track, the high fill on which the tracks had been carried had been entirely swept away. Still east of this, for nearly the entire four miles to Coshocton, the track and roadbed had been practically destroyed. Here, and at many other places in the fifty miles between Black Run and Tuscarawas, the tracks hung in festoons, unsupported except by rail couplings, over long and deep gaps—temporary rivers of back water rushing to regain the river channels from which they had been dammed by the railway embankment. For miles the telegraph poles and lines were completely submerged and practically destroyed in many places by the washing away of poles or the breaking of wires by debris in the water.

It was found that the portion of the Division that would take longest to repair was between Morgans Run and Conesville, including Bridge 100 and its approach.

Gnadenhutten, Ohio. March 28, 1913.

Culvert 91½, one-half mile east of Station. Water had fallen 10 inches.

Gnadenhutten, Ohio, east of. March 28, 1913.

Water had fallen one foot.

Gnadenhutten, Ohio. March 28, 1913.

Bridge 92, over Tuscarawas River. Water had fallen 18 inches.

Lock 17, west of. March 28, 1913.

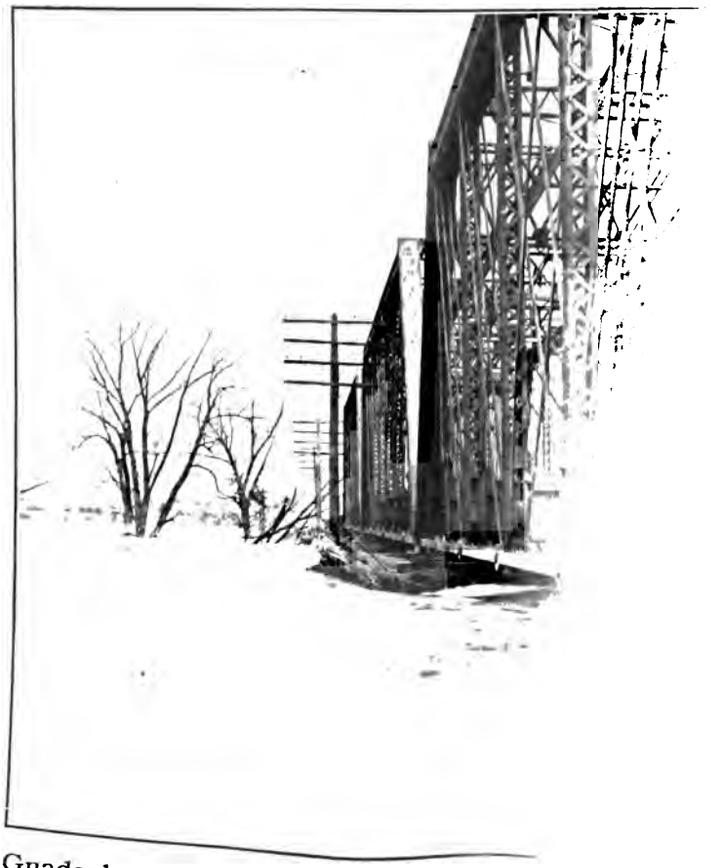
Motor boat starting down Tuscarawas River for Bridge 100, over Muskingum River, to ascertain conditions in intervening territory.

Port Washington, Ohio, east of. March 28, 1913.

Culvert ¼ mile east of Station, view east. Water had fallen a foot or more.

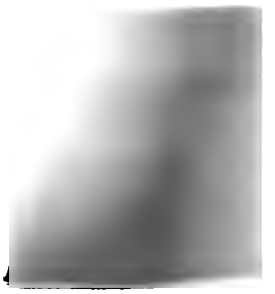
Port Washington, Ohio, west of. March 28, 1913.

View east from "DG" Tower. Water had fallen 16 inches.



Gnadenhutten, Ohio.

Bridge 92, over Tuscar



Port Washington, Ohio, west of. March 29, 1913.

View east, 1¾ miles west of Station.

Port Washington, Ohio, west of. March 29, 1913.

View east, at point 2¼ miles west of Station.

March 28, 1913.

Port Washington, Ohio, west of.
View west from "DG" Tower. Water had fallen 16 inches.

March 28, 1913.

Port Washington, Ohio, west of.
Water had fallen 14 inches. Water over tracks is back-water returning to river channel.

Port Washington, Ohio, west of. March 29, 1913.

View east, 1¾ miles west of Station.

Port Washington, Ohio, west of. March 29, 1913.

View east, at point 2¼ miles west of Station.

New Comerstown, Ohio, east of. March 29, 1913.

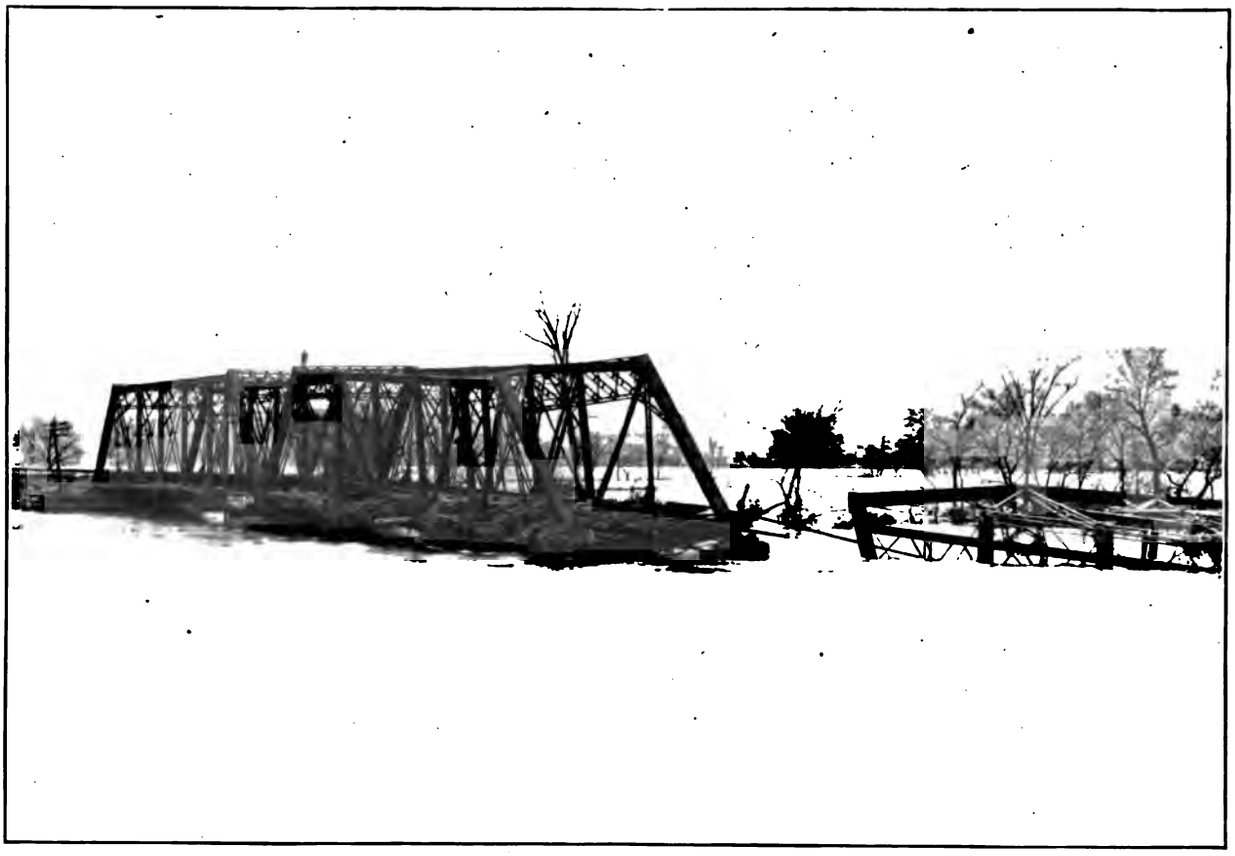
View east, over washout at Culvert 92-G.

New Comerstown, Ohio, west of. March 29, 1913.

Looking east toward Bridge 94, over Tuscarawas River, two miles west of New Comerstown.

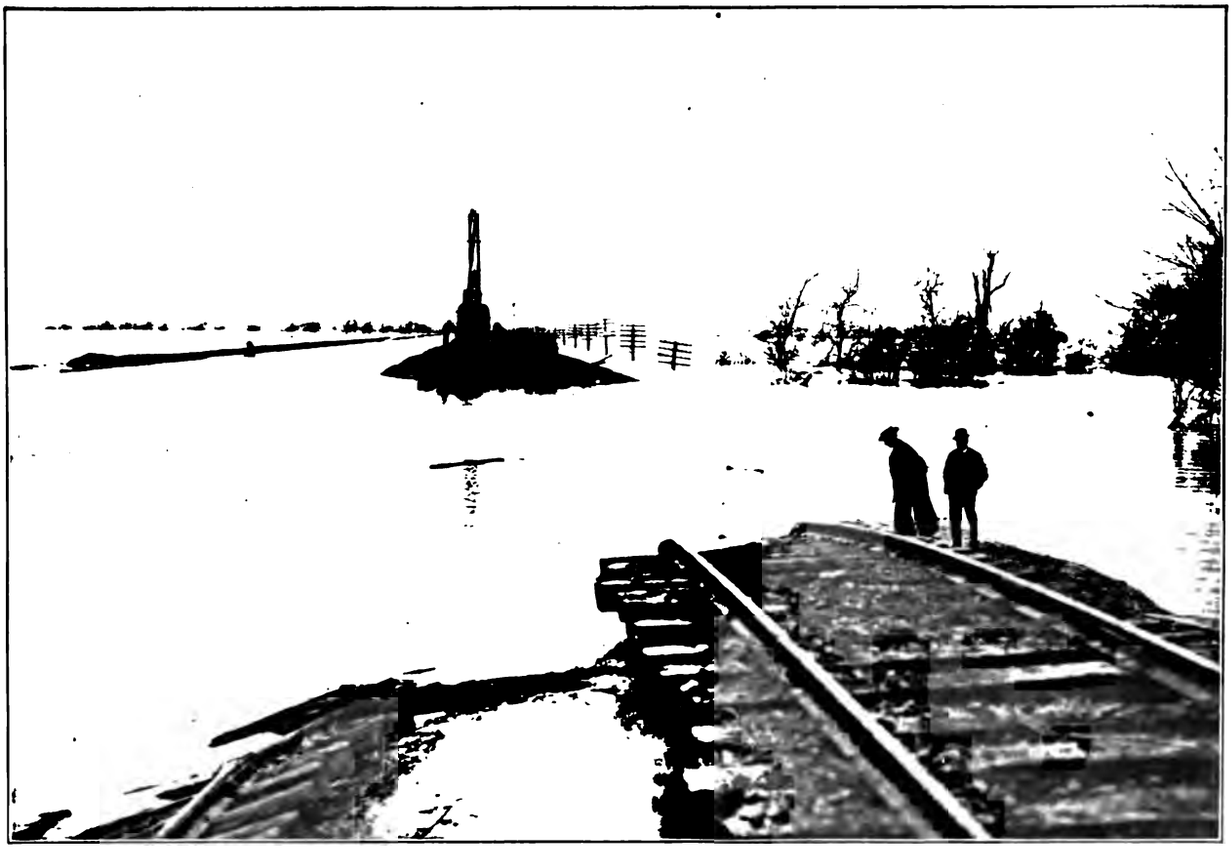
Coshocton, Ohio, east of. March 29, 1913.

Looking east at "Clow."



Coshocton, Ohio, west of. March 29, 1913.

Bridge 100, from west bank of Muskingum River; two spans gone, one span dropped on one corner, and one span uninjured.



Trinway, Ohio, east of. March 29, 1913.

View west at site of Bridge 104, carrying an overflow from the Ohio Canal; 10 foot stone arch washed out.

Trinway, Ohio. March 29, 1913.

Passenger Station and surroundings. Water had fallen about 10 or 12 feet.

Between these points the Wheeling & Lake Erie has a single track road, and it was suggested that it might be possible to repair the damage done it, and put in connections at either end, and so provide a route sooner than the Pan Handle could be opened. Inspection revealed their condition to be equally as bad or worse than that of the Pan Handle and the scheme had to be dropped.

It was also found that many new cross ties that had been stored along the right of way for this year's renewals had been carried away by the flood, and that where the track had been torn up many of the ties had been carried away, the total being somewhere in the neighborhood of 50,000. Those that were found lodged where they could be gotten by track men were used in rebuilding work, but most of them were washed so far away that they could not be recovered except by team and wagons. An offer was made to farmers and the public of 10 cents for each cross tie returned, and under this offer a total of 3,750 was so returned during the succeeding weeks.

Sunday, March 30th, the stage of water now permitting, the work of repair was begun in earnest. The force of track men was augmented by two hundred men from Dennison Shop, and a hundred and seventy-five laborers from New York. Bridge timber and piling were arriving in quantity. The force working at the east end of the washed out district finished up in the vicinity of Port Washington and Glasgow Curve, and late at night moved to the west approach of Bridge 94 over the Tuscarawas River, west of New Comerstown. The force that had been organized at the west end began the driving of piling at Bridge 104, where a 10 foot stone arch and the embankment had been washed away, requiring a trestle three hundred feet long.

On Monday the 31st, the pile driver began work west of Bridge 94 about 9:00 A. M. At 6:00 P. M. about fifty feet of trestle had been driven, toward closing a gap of 804 feet, 15 to 20 feet deep. Arrangements were made to build trestle bents at the east side, float them across the break and set then up at the west side.

Work trains with large gangs, and whatever filling material could be secured, followed in the wake of the pile driver outfits, and put the track in shape for service as rapidly as possible.

The P. W. & K. road was opened to Wheeling, the first train arriving there at 11:10 A. M.

On April 1st, the force at the east end continued to drive piles and build trestle west of Bridge 94, and to repair the tracks over which the driver had been brought. The force at the west end continued to drive trestle over the gap at Bridge 104, while one track was being put in shape for use as far east as Trinway. In the evening the New Cumberland Branch was opened for service.

On the 2d, work was begun on cribbing up the track and making it ready for work trains, between the point where the driver was working, near Bridge 94, and Coshocton, so that when the driving of piling was finished the plant might be moved to the latter point promptly.

Contractor's men, who had been engaged to lift one corner of the second span of Bridge 100, at Tyndall, arrived there on the 2d, taking their heavy tools and material by wagon overland, and began work of cribbing up the leaning span, which was to be straightened and repaired for temporary service, leaving only two spans to be replaced by trestle.

It rained nearly all day, and the rivers began to rise again during the night. Bridge 92, over the Tuscarawas, at Gnadenhutten, which had not previously been in

trouble, now had its west abutment undermined sufficiently to cause some settlement. Arrangements were at once made to protect it from further damage by dumping rip-rap around it, and although it was safe for slow speed only, it was not put out of commission entirely.

On April 3d, early in the morning, the work of trestling just west of Bridge 94 was completed, and the driver and outfit was moved west toward the break west of Coshocton, where it arrived in the evening. Conditions in the intervening territory were such that it took the whole day to move fifteen miles. The best track had been cribbed up at each "festoon," and by placing temporary crossovers, one track had been provided through the whole distance, but it was at many places a series of "shoot the chutes," rather than a track.

The force at the west end completed the trestling for one track at Bridge 104, and cribbed up one track at Bridge 101, permitting the movement of the driver to the west end of Bridge 100, over the Muskingum, during the evening. Another pile driver arrived from the west, and started driving for a second track at Bridge 104.

Local passenger service, which had been so far performed only from Pittsburgh to Dennison, was today extended to New Comerstown. On the west end trains continued to run between Pittsburgh and Trinway only, until the following day, when one train was run to Conesville.

With the arrival of the driver and supply trains at the break east of Bridge 100, work was commenced in the evening on driving westwardly from the east end, and on the construction of a track on the low level, toward the west end of the break, to provide a way of sending another driver to that side, and permit trestling from both ends.

On the morning of Friday the 4th, the driving of piling commenced at the west bank of the Muskingum River at Bridge 100. When the second bent was started, the channel was found to be too deep for the 50 foot piling. A few 60 and 70 foot piles were found on the east side of the river, and arrangements were made to float them across, but night came on before this could be accomplished, and the swift current made it necessary to wait for daylight before attempting it.

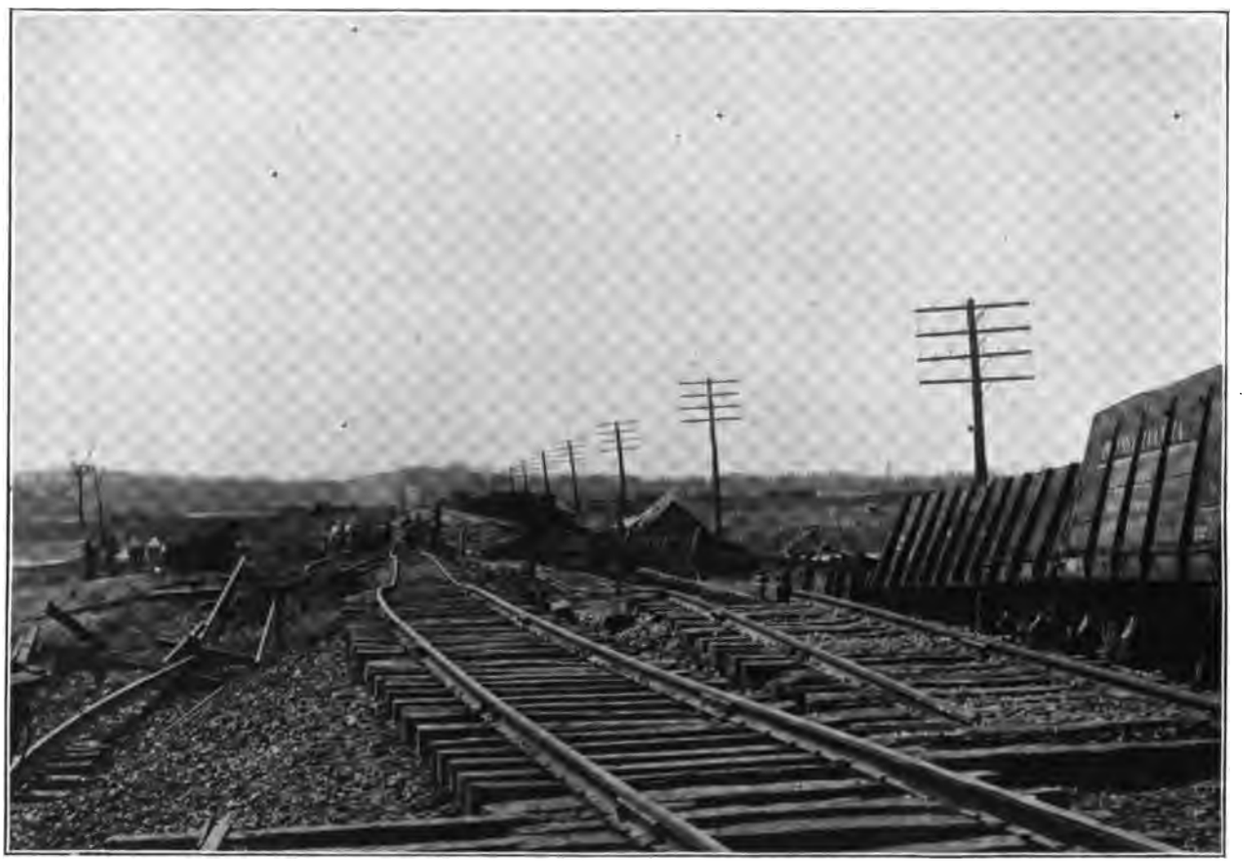
Gangs of men with work trains continued to put the tracks in shape for service as rapidly as possible, and local freight service was extended to Coshocton. Frequent heavy showers considerably hampered the work everywhere, but good progress was made. The Muskingum rose about two feet during the day and night, but did not seriously interfere with repair work. The motor boat which had been sent down from Dennison was used as a means of communication across the stream, and to assist in rafting piling and material across for the work at the west side, and this and row boats were used to transfer workmen from one side to the other.

On Saturday the 5th, the driver advancing on the low level toward the west end of the break passed the first deep hole and advanced to the second. The driver on the permanent grade at the east side made good progress, but the one on the west side of the river could work only as fast as long piling could be gotten across the river, and up the very steep bank.

On Sunday the 6th, a driver better suited to the work replaced the one on the permanent grade at the east end, and the driver released was sent back to the break west of Bridge 94 to trestle for a second track. A wreck train removed the overturned and damaged cars from the sidings at Clow and the gravel pit. Other drivers arriving,

New Comerstown, Ohio, west of. April 3, 1913.

Looking west, about one-half mile west of Bridge 94, and showing temporary trestle for one track over washout.



Coshocton, Ohio, west of. April 4, 1913.

Looking west, west of "Clow." Work trains have passed over the track on which men are working, and are proceeding toward Bridge 100.

Coshocton, Ohio, west of. April 4, 1913.

Passing tracks, etc., at "Clow" undermined, and equipment more or less damaged.

Coshocton, Ohio, west of. April 4, 1913.

Condition of tracks at "Clow" after one track had been sufficiently repaired to permit passage of work trains, en route west to Bridge 100.

Coshocton, Ohio, west of. April 4, 1913.

Fill east of Bridge 100 washed away, exposing piling driven in repairing damage done by flood of 1898, but not in condition for use.

Coshocton, Ohio, west of. April 4, 1913.

Driving piling at deepest hole washed in approach to Bridge 100, over Muskingum River, driver working on "lower level."

Coshocton, Ohio, west of. April 4, 1913.

Bridge 100, looking west, where first piling is being driven in channel of river at west side.

Trinway, Ohio. April 5, 1913.

View west at south side of yard, showing tracks undermined and equipment more or less damaged.

one was started on a second track on the permanent grade at the east side of the break, following in the wake of the one working toward Bridge 100.

The supply of very long piling having been exhausted, a seventy foot spruce pile having broken in the driving, and the high wind shaking the driver and trestle, it was necessary to stop driving at the west side of the river until the trestle was strengthened and arrangements could be made to cut long piling of hard wood in the surrounding territory. These were difficult to find of suitable length and straightness, but enough were procured to permit advancing slowly with the work, while requests for long hardwood piles were sent out it all directions. A driver was secured which could drive further below the track level, but at that it was found that seventy foot piles would be needed.

On Monday the 7th, the driver on the lower level reached the west side of the break, just east of Bridge 100, and was started at work on the permanent grade at the west end. This low level track provided a means of reaching the bridge with tools and material, and a derrick was taken there to assist in repairing the second span. On the 8th, the cribbing under this span was completed and the raising of the steel work started.

The work proceeded without much variation until Saturday the 12th, when one track across the break east of Bridge 100 was completed, and a second track over the break west of Bridge 94.

On Sunday morning, the 13th of April, the trestle was completed across the river at Bridge 100. The damaged span having already been put in shape for use, a heavy engine was sent across the river at 6:50 A. M., and passenger service was resumed over the Pittsburgh Division, eighteen and a half days after Bridge 101 and 100 went down. Freight service was resumed on Sunday night.

Two tracks had been provided everywhere but at Bridge 100 and across the break just east of it, and the work of providing a second track through this district was not completed until June 11th. Instead of trestling the river with the second track, cluster pile towers were driven, and girders laid on them, to prevent too great interference with the stream flow until such time as a permanent bridge could be built. When this second track was completed, traffic was sent over it while the first track was rebuilt in the same way, and a double track road was not available over the Muskingum River until the middle of August.

To give an idea of the extent of the damage done on the Pittsburgh Division, and its distribution over the whole Division, the points of damage have been listed in detail.

PITTSBURGH DIVISION.

DETAILED LIST OF DAMAGE DONE BY FLOOD OF MARCH, 1913.

Mile Post from Pittsburgh	+Ft.	LOCATION AND DESCRIPTION	Date Cleared		Cu. Yds. of Fill	Cu. Yds. of Ballast	Lineal Feet Trestle	
			1st Track	2nd Track			1st Track	2nd Track
		Collier, W. Va.						
35	3217	Wing wall washed out at Bridge No. 34	3-27	.....	200	.....	.....	.....
		Ballast washed out under three tracks in Collier Yard, 200′ long	3-26	3-26	.....	360	.....	.....
		Embankment washed out under No. 3 track east of "MN" Tower, 300′ long	3-26	.....	300	100	.....	.....
37	3000	Three tracks washed out 8′deep, 30′ long; 1000 sacks of Portland cement in shed destroyed at Bridge No. 38	3-26	3-26	400	60	.....	.....
		Embankment washed out west of Bridge No. 39 and Bridge No. 40 under No. 2 track.	3-27	.....	1000	.....	.....	.....
		Mingo Junction, Ohio.						
45	3000	Land slide covering No. 1 and No. 3 tracks and a few cubic yards on No. 2 track. No. 2 track opened immediately	3-27	4-4	3000 (Excava.)	300	.....	.....
		Tuscarawas, Ohio.						
94	3600	Roadbed washed out 125′ long, 4′ to 8′ deep. Nine pile bents placed under No. 2 track, Romigs Crossing	3-28	3-30	1200	150	120	.....
96	1900	Ballast washed out under both tracks, 750′ long, 2′ to 4′ deep	3-29	3-30	750	900	.....	.....
		Gnadenhutten, Ohio.						
97	1300	Bridge No. 92, north end west abutment undermined. Filled with riprap. (Discovered April 3)	4-3	.....	700	.....	.....	.....
		West pier undermined at north end but not discovered at time.						
		Lock 17, Ohio.						
97	5000	Roadbed washed out 100′ long, 2′ to 3′ deep	3-29	3-29	50	100	.....	.....
99	00	Embankment washed out 20′ long on south side of tracks up to end of ties	3-29	.....	40	.....	.....	.....
99	4100	Roadbed washed out 300′ long, 4′ deep, No. 2 track blocked up and both tracks filled	3-29	4-2	800	540	.....	.....
100	2400	Roadbed washed out, 600′ long, 2′ to 8′ deep	3-29	4-2	2000	720	.....	.....
100	3800	Roadbed washed out, 300′ long, 2′ to 8′ deep	3-30	4-2	1000	360	.....	.....
101	00	Embankment on north side of tracks washed out to end of ties, 20′ long	3-30	4-2	50	.....	.....	.....
101	2800	Roadbed washed out, 3000′ long; 5-bent trestle built under No. 2 track at small culvert	3-30	4-2	1000	3600	60	.....
		Port Washington.						
102	2200	Roadbed washed out 750′ long, 2′ to 7′ deep; 40″ concrete pipe put in temporarily under all three tracks; ballast badly washed for 500′ east	3-30	4-2	4000	900	.....	.....
102	4400	Roadbed washed out 400′ long, 3′ deep; ballast washed 200′ further	3-30	4-3	1500	1000	.....	.....
103	200	Ballast washed out under all tracks 3000′ long; including 1 hole 400′ long, 3′ deep; 1 hole 60′ long, 4′ deep, and 1 hole 150′ long, 2′ to 8′ deep	3-30	4-3	2000	1500	.....	.....
103	3300	No. 1 track washed out 40′ long, 3′ deep	3-30	.....	50	.....	.....	.....
104	00	Roadbed washed out 1600′ long, 2′ to 5′ deep; ballast washed out 300′ farther on east end	3-30	4-3	4000	2300	.....	.....
104	1300	Ballast washed out 300′ long	3-30	4-4	100	360	.....	.....

PITTSBURGH DIVISION.
DETAILED LIST OF DAMAGE DONE BY FLOOD OF MARCH, 1913.

Mile Post from Pittsburgh	+Ft.	LOCATION AND DESCRIPTION	Date Cleared		Cu. Yds. of Fill	Cu. Yds. of Ballast	Lineal Feet Trestle	
			1st Track	2nd Track			1st Track	2nd Track
104	2000	Roadbed washed out 250′ long, 12′ to 15′ deep. Trestle built on No. 2 track. Ballast washed badly for 1800′ west	3–31	4–4	4000	1000	132	.....
104	4300	Embankment 300′ long, 12′ to 15′ deep, washed away along No. 2 track	3–31	4–4	1000	.....	.....	.....
106	00	Ballast washed out 4300′ long, including 1 hole 750′ long, 2′ deep, and 1 hole 850′ long, 2′ deep	3–31	4–4	1000	2500	.....	.....
		New Comerstown.						
108	2300	Roadbed washed out under three tracks, 50′ long, 2′ to 3′ deep	3–31	4–12	300	100	.....	.....
109	4800	Roadbed washed out 860′ long, 14′ deep, both tracks	4–3	4–12	43000	1000	803	480
110	800	Ballast out under No. 2 track 500′	4–3	.....	.....	200	.....	.....
110	3600	Ballast washed out 1350′ under 3 tracks, including 1 hole 400′ long, 3′ to 15′ deep	4–3	4–4	4500	1600	.....	.....
		Isleta.						
112	800	Roadbed washed out 50′ long, 2′ deep	4–3	4–4	.....	60	.....	.....
112	1000	Roadbed washed out 120′ long, 2′ deep	4–3	4–4	.....	150	.....	.....
112	1700	Roadbed washed out 450′ long, 2′ to 6′ deep	4–3	4–4	2400	540	.....	.....
112	2900	Roadbed washed out 600′ long, 2′ to 8′ deep	4–3	4–4	3000	700	.....	.....
		West LaFayette.						
117	2200	Bridge No. 96. Embankment badly washed	4–3	.....	200	.....	.....	.....
118	00	Embankment washed along south sodline 2700′ long, and 20′ of Morgans Run Eastward platform washed away	4–3	.....	1000	.....	.....	.....
		Morgans Run.						
120	00	Light slip on south slope along No. 4 track.	4–3	.....	50 (Excava.)	.....	.....	.....
120	1500	Light slip on south slope along No. 4 track.	4–3	.....	50 (Excava.)	.....	.....	.....
120	4200	North embankment washed under No. 3 track 50′ long, 6′ deep	4–3	.....	200	.....	.....	.....
120	4600	North embankment washed out to end of ties along No. 3 track 100′ long	4–3	.....	300	.....	.....	.....
121	2500	Series of small holes washed out under No. 4 track	4–3	.....	3500	100	.....	.....
		Coshocton.						
123	100	North embankment washed out under No. 1 track, 500′ long, 2′ to 6′ deep	4–3	4–13	600	150	.....	.....
123	700	North embankment washed out under No. 1 track, 160′ long, 2′ deep	4–3	4–13	100	30	.....	.....
123	3000	1500′ of roadbed along No. 2 track badly washed to end of ties	4–3	4–13	1000	100	.....	.....
123	4600	1600′ of embankment washed out under drill track and 500′ of siding to J. Clow & Sons plant all washed away	4–3	4–13	6000	1300	.....	.....
124	700	Roadbed washed out under three tracks, 1000′ long, 4′ to 16′ deep, and tracks washed out of line 20′	4–3	4–13	22000	1800	.....	.....
124	2400	Roadbed washed out 450′ long, 6′ to 8′ deep. Six cars derailed from siding. Ballast and bank cut out to end of ties 800′ long, 4′ deep, along No. 1 track, east of hole	4–3	4–13	4500	1000	.....	.....
124	4200	Roadbed washed out 1200′ long, 6′ to 10′ deep. 1300′ ballast washed out east of hole. 4 cars overturned	4–3	4–13	19000	3000	.....	.....
126	2600	Roadbed washed out 2700′ long, 10′ to 25′ deep	4–12	4–20	60000 (Low Grade)	3300	2140 396	2106

PITTSBURGH DIVISION.
DETAILED LIST OF DAMAGE DONE BY FLOOD OF MARCH, 1913.

Mile Post from Pittsburgh	+Ft.	LOCATION AND DESCRIPTION	Date Cleared		Cu. Yds. of Fill	Cu. Yds. of Ballast	Lineal Feet Trestle	
			1st Track	2nd Track			1st Track	2nd Track
127	00	Bridge No. 100, double track through truss; Piers Nos. 2 and 3 washed out; Span No. 2 settled at west end. Spans 3 and 4 turned over into river bed. After No. 2 track was opened on pile trestle Spans 3 and 4 were renewed for 2 tracks with deck plate girders on cluster pile bents	4–13	6–11			306	
		Tyndall.						
127	4700	Bridge No. 101, concrete rail-top undergrade, and embankment 100′ long for three tracks, washed out. Pile trestle built for three tracks, 85 lin. ft. each	4–3	4–13	1600	180	85	85
		Conesville.						
131	00	Embankment along No. 2 track badly washed 1100′ long			1400			
		Adams Mills.						
133	00	North embankment badly washed 2250′ long. No. 1 track washed out 500′ long, 4′ deep	4–3		3000	300		
133	2700	No. 1 track and siding to Icehouse washed out, 300′ long. Ballast washed out 1800′ long	4–3		200	1000		
134	00	No. 1 track washed out 2′ to 6′ deep, 7100′ long	4–3		10000	2000		
134	4200	Bridge No. 104, 10′ arch, washed out; embankment washed out under both tracks, 400′ long, 10′ to 25′ deep	4–3	4–12	15000	500	344	300
		Trinway.						
136	00	1500′ yard track washed out in Trinway yard				900		
136	1300	Embankment slipped out under No. 1 and No. 4 tracks, 100′ long; 23 piles driven along south side of bank	4–2	4–2	100			
137	2700	Embankment badly washed along north side for 250′	4–2	4–2	500			
		Frazeysburg.						
144	300	Bridge No. 113, both abutments undermined, cracked and settled; tracks shifted north and concrete slabs blocked up on timber	4–2	4–2				
		Total Main Line			230,500 3100 (Excava.)	36,760	4,386	2,971
		New Cumberland Branch 6000 lin. ft. track lined and surfaced. 8000 lin. ft. sunken track surfaced. 35000 lin. ft. track mud cleaned off.	4–4		3500 800 (Excava.)	2000		
		P. W. & K. R. R. 1200 lin. ft. track lined and surfaced. 13000 lin. ft. sunken track surfaced. 30000 lin. ft. track mud cleaned off.	3–31		6000	600		
		Hickory Branch	3–31		500			
		Total, Branches			10,000 800 (Excava.)	2,600		

Gnadenhutten, Ohio. April 21, 1913.

Bridge 92, over Tuscarawas River. West approach fill washed out, and replaced with stone and riprap. Abutment slightly cracked.

Port Washington, Ohio. April 21, 1913.

View east, showing track as replaced for regular service.

Coshocton, Ohio, west of. April 22, 1913.

View east, east of Bridge 100, showing new fill replacing conditions shown in the frontispiece.

Coshocton, Ohio, west of. April 22, 1913.

View east, east of Bridge 100, showing pile trestle over deepest washout in fill.

Coshocton, Ohio, west of. April 22, 1913.

Bridge 100, over Muskingum River; second span raised and supported on timber falsework on account of undermining of pier.

Coshocton, Ohio, west of. April 22, 1913.

Bridge 100, over Muskingum River; trestle replacing one track across channel of river completed; driver starting work for second track.

Coshocton, Ohio, west of. April 22, 1913.
Trestle replacing Bridge 101, a cattle pass. Rail used in cribbing is part of the top of the old bridge, which had a slab top of rail, brick and concrete.

Trinway, Ohio, east of. April 22, 1913.
Trestle replacing Bridge 104, carrying an overflow from the Ohio Canal; 10 foot stone arch washed out.

CHAPTER 19.

COLUMBUS TERMINAL DISTRICT.

INDIANAPOLIS AND CINCINNATI DIVISIONS.

As all the damage in the Columbus Terminal district was done at one stroke, and as most of the repairs were made by the Indianapolis Division on both divisions, it seems desirable to let one account cover the whole situation.

The Scioto River flows eastwardly for about two miles toward Columbus, then turns abruptly south, separating Columbus into two parts, the main City on the east bank, and a residential section on the west side, which for convenience will be called West Columbus. Just before making the turn to the south, the Scioto River is joined by the Olentangy. These streams occupy a low valley, and as every flood stage would inundate West Columbus, that section has been protected by levees where the fill of the Big Four Railway does not answer that purpose. Through this district the railways have all been raised in recent years to separate the grades of streets and railways. All tracks have been carried on embankments and overhead bridges span the principal streets.

The river, in this instance, was called upon to carry about twice as much water as the waterways at the bridges would accommodate, and the result was that the levees were overrun within a short time. Their construction was not calculated to resist the erosion from overflow, and these levees gave way very promptly. The fill of the Cincinnati Division then acted as a dam, with openings at each of the street bridges. These were insufficient to pass the great quantity of water, and the force of the deluge cut the embankment away wherever there was an opening until a sufficient waterway was provided. At the street crossings the current was so strong that it tore up the street surface and the concrete substructure and excavated holes ten or twelve feet deep. The material of the destroyed fill was washed far away; even the heavy boulders which made up a large part of the gravel used for fill were carried hundreds of yards, and strewn over everything, sometimes even piling up in the houses several feet deep.

The flood carried many buildings from above down through this district, and tore up and carried away innumerable residences through the whole of West Columbus. Houses were tumbled topsy-turvy everywhere; some were even left standing on their roofs; some were cut in two—one part being swept away, the other standing. Pianos, furniture and debris were scattered over the whole landscape when the water went down.

There were four main washouts on the Cincinnati Division tracks:

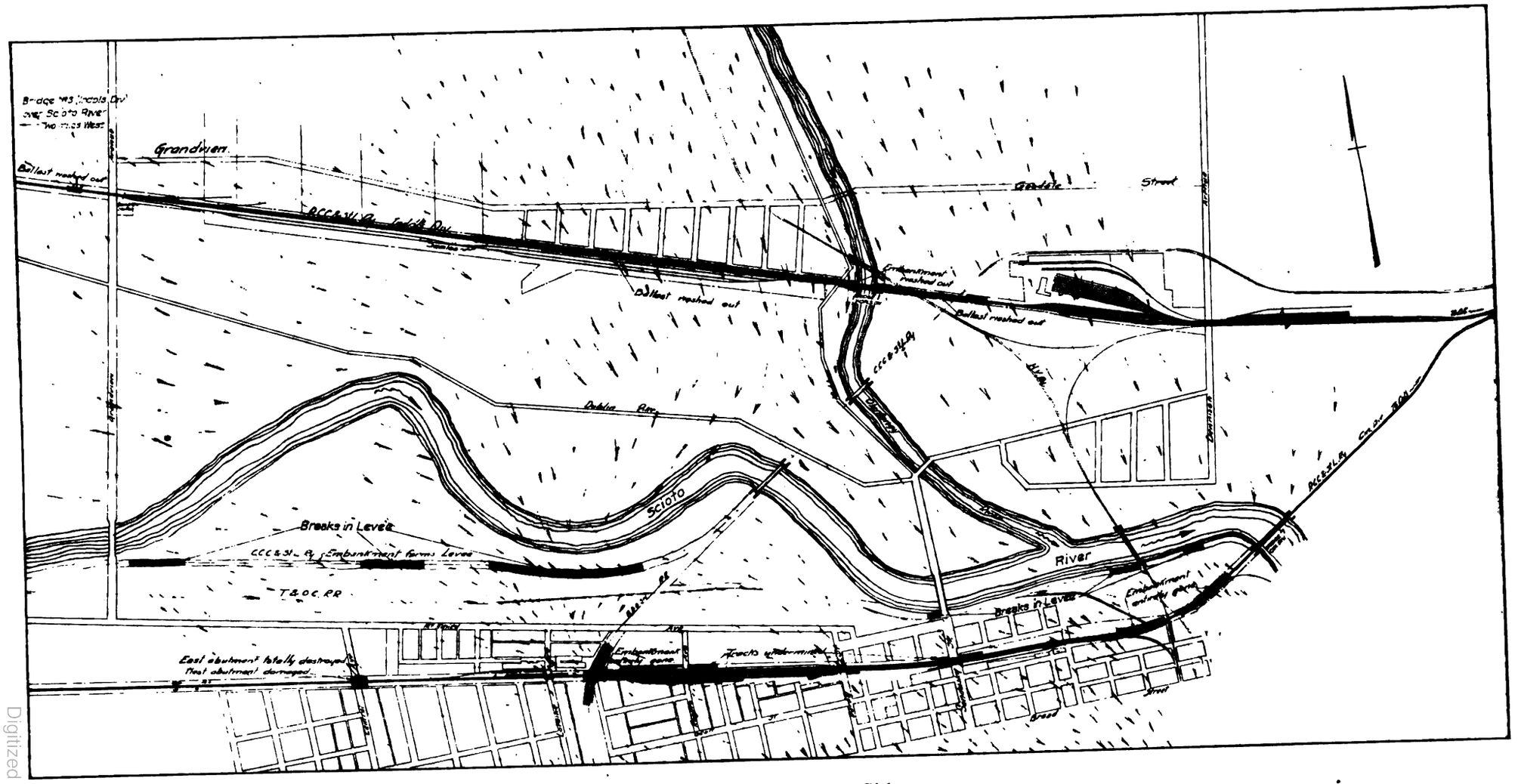
One between the Scioto River Bridge and the Hocking Valley crossing.

One just west of the Hocking Valley crossing.

One at the B. & O. S. W. crossing.

One at Central Avenue, including the viaduct,

Several others occurred in the same district, but they were not serious.



Columbus, Ohio, West Side.

Sketch map showing tracks of Indianapolis and Cincinnati Divisions, direction of currents over lowlands, and points of main damage to roadbed and bridges.

West Columbus, Ohio. March 26, 1913.

Cincinnati Division tracks, looking west from T. & O. C. crossing. Sandusky street bridge over Scioto River appears in distance at right.

Marble Cliff, Ohio. April 1, 1913.

Alignment of Bridge 3, over Scioto River, after west pier was undermined.

The Indianapolis Division tracks across the lowland north of the river were badly washed on both sides of the Olentangy River bridge (No. 1, Indianapolis Division). The bridge itself was not damaged, as it was protected by a heavy riveted-truss bridge of the Hocking Valley just above it set at an angle with the current, deflecting the debris which otherwise would probably have swept away Bridge 1. At Cincinnati Division Bridge 3, over the Scioto, the water came to the bottom of the lower chord, and a gang of men constantly kept the drift pushed down so as to pass under the steel work and it was not damaged. Bridge 3 on the Indianapolis Division, some three miles up stream, was but slightly damaged at first, although one pier had been undermined sufficiently to throw the bridge slightly out of line, so that it was deemed unsafe for passenger trains. For one or two days days, however, it was used in hauling filling material for repair work, until it was further undermined and rendered unfit for any use on the 28th.

The water did not go down enough to permit repair work to commence until the 27th. On the 28th the Indianapolis Division had one track restored to service through from Columbus over the Olentangy and Scioto Rivers and the valley between, but the Scioto River bridge (No. 3) was put out of service late in the day, after having been used but a few hours for relief trains for Dayton, and local passenger trains.

Bridge 3 is a double track, deck truss bridge, of three spans, high above the stream. The west pier was undermined on the north (upstream) side so that one of the two supports of the superstructure was let down enough to move the top of the truss 23 inches to the north, settling vertically 9 inches. The south end of the pier remaining in place, a crack developed in the pier, about 12 inches wide, from the top to the bottom of the masonry.

On the 29th, the pier was tied together with timbers and steel rods and the crack closed about an inch. Small dump cars were then used to dump stone around this pier (and the other one as well, as a precautionary measure) and support afforded the stone work. Sufficient rip-rap was put in the stream to form a foundation for frame bents to support the north half of the superstructure, which was jacked into place. It was not until April 7th that it was reopened for one track. Further repair was turned over to a contractor, the bridge being supported so that the old pier might be torn down and replaced with one of concrete. The track on the damaged side of the bridge was restored to service May 27th at reduced speed.

Work on the Cincinnati Division washouts commenced on March 27th. On the 28th the washout west of Hocking Valley crossing was made ready for work train service, and on the 29th, the one east of the crossing. A track was thus provided by which work trains might reach the more extensive break at the B. & O. S. W. crossing. There a "rundown" was made on either side, and the track connected across the gap on the 30th, cribbing being used where the water was still running through. The track was gradually raised and the crib filled in with stone from nearby quarries and dirt from a steam shovel put to work at Grandview.

At the fourth washout, Central Avenue viaduct, stringers were placed between the damaged abutments, supported on cribbing, and a fill made, using material from a contractor's steam shovel cut in near Alton. One track was put in service here on April 1st, and double track service was re-established on the Cincinnati Division on April 2d except for four gauntlets where the breaks had been, where only one track had been replaced. It was not until the 16th that the last of these gauntlets had been removed.

Within a few weeks, work was started on a new bridge to replace Central Avenue viaduct, necessitating a run-around track for temporary use.

At the Sandusky Street viaduct, the roadway under the bridge was partially filled with debris, but the structure was not damaged. At Rogers Avenue, the south wing walls were undermined by the deep scouring, and were repaired by filling in with concrete, the structure being otherwise undamaged.

Marble Cliff, Ohio. April 1, 1913.

Bridge No. 3, over Scioto River, showing west pier undermined on north side; cracked pier held together with iron rod bands; Rip-rap thrown in stream around it, and walkway from shore to pier suspended by ropes from Bridge superstructure.

Marble Cliff, Ohio. April 23, 1913.

View west, at Bridge 3, over Scioto River, showing west pier being replaced.

West Columbus, Ohio. March 31, 1913.

Looking east over washout west of Hocking Valley Crossing.

West Columbus, Ohio. March 31, 1913.

Sandusky Street viaduct, looking toward river channel, at point where levee was washed entirely away, taking large water main with it.

West Columbus, Ohio. April 23, 1913.

Sandusky Street subway, looking north, after roadway had been cleared.

West Columbus, Ohio. March 31, 1913.

Rodgers Avenue viaduct—viaduct itself not damaged, but roadbed badly washed and pavement under viaduct destroyed.

West Columbus, Ohio. April 23, 1913.

Rodgers Avenue viaduct, showing condition of street pavement and subgrade under viaduct. Foundations of viaduct being deepened.

West Columbus, Ohio. March 31, 1913.

B. & O. Crossing, looking west, showing forces at work replacing roadbed destroyed.

West Columbus, Ohio. March 31, 1913.

View east, at B. & O. Crossing. Replacing fill washed away. Cars standing on old fill to right of center of picture, in distance.

West Columbus, Ohio. April 6, 1913.

B. & O. Crossing; one track sufficiently restored to permit passage of trains.

West Columbus, Ohio. April 23, 1913.

B. & O. Crossing, looking west; ballasting new track for resumption of service at regular speed.

West Columbus, Ohio. March 30, 1913.

View east, showing Central Avenue viaduct being replaced with cribbed trestle, preparatory to making temporary fill.

West Columbus, Ohio. March 31, 1913.

Looking north on Central Avenue; filling in from temporary cribbed trestle where viaduct was washed away.

West Columbus, Ohio. April 6, 1913.

Central Avenue viaduct; fill temporarily replacing bridge.

CHAPTER 20.

INDIANAPOLIS DIVISION.

The Indianapolis Division runs at right angles to the drainage basins, and the damage sustained was to bridges over the streams it crosses. The portion of the division from Urbana west to Richmond lies but a short distance south of the main divide, and as it lies also in the belt of heaviest rainfall, it was here that the flood first affected the Pennsylvania Lines.

At Piqua the Miami River, and near Richmond the East Fork of the White River, came up to the track level early on the 24th of March, and by night all the streams were at unprecedented flood stages. The track was badly washed out at New Madison, Ohio, and during the night a work train was started from Bradford Junction to make repairs. They had gone but about seven miles when Bridge No. 58, a stone arch over Middle Creek, or "Dry" Creek, near Gettysburg, Ohio, went down with the rear of the train, the heavy engine and three cars having crossed in safety. The foreman and five laborers were drowned; 14 other laborers, the conductor and two brakemen were injured. The injured were taken to Greenville and cared for until a detour route could be found to get them to a hospital at Piqua.

At about the same time, on account of washouts west of Urbana, train No. 3, enroute to Chicago, was detoured north over the Big Four Railway, to be taken to Union City and there returned to the Pan Handle. As it pulled over the Mad River bridge at West Liberty, the same stream which had caused the trouble west of Urbana, the bridge went down with the engine and one car. The train having been reversed in delivering it to the Big Four, the engine was backing, and the car next to it was the Columbus-Chicago sleeper. The engineman, fireman and pilot were on the engine. The first two got ashore with but slight injuries. The pilot was washed down the river but was able to cling to a bridge about half a mile down stream, from which he was rescued after daybreak. One end of the sleeper rested on the bank, and the other end swung around until the car rested on its side along the river bank. Several passengers were slightly injured, and a brakeman, who was riding in the end of the car next the engine, was killed or drowned and his body was not recovered for several days.

The injured were provided with blankets from the Pullman cars, and food supplies were confiscated from the express car for the passengers, for the track had been washed out back of the train, so that it was impossible to reach it from either side. It was not until noon (March 25th), when a relief train succeeded in getting within a mile and a half of No. 3, that the passengers, including the injured, could be transferred to this train and brought back to Urbana. Part of the crew was left in charge of the train, until it was returned to Urbana on the afternoon of the 28th.

On the 25th, the Indianapolis Division, cut into many pieces, found on its hands six passenger trains marooned at outlying points, with twelve more at Columbus terminal, and two at Richmond; and fourteen freight trains marooned at outlying points. Three

of these passenger trains (all east bound) were at Bradford Junction, where the Railway Y. M. C. A. afforded facilities for caring for passengers. Some of the passengers amused themselves by getting up a newspaper, which a local publisher printed for them, on March 27th. Two trains, one in either direction, were stopped at New Madison, and one westbound train at Urbana.

The damage sustained by the Indianapolis Division, outside of Columbus terminal, which has been mentioned in a previous chapter, consisted of damage to bridges as follows:

Bridge No. 35, west of Urbana, over large ditch.

Both new and old line bridges undermined at one end. The old line bridge had to be supported temporarily on piling.

Bridge 37, west of Urbana, over large ditch.

Both new and old line bridges undermined.

Bridge No. 39, west of Urbana, over Spring Creek.

Both new and old line bridges undermined.

East abutment of bridge, carrying eastward track, so undermined that piling was necessary to carry it temporarily.

Bridge No. 50, Piqua, Ohio, over Miami River and Canal.

The bridge itself was not damaged, although the west abutment was undermined and one span had to be partly supported on piling. The east approach to the bridge was entirely washed away, and 140 lineal feet of pile trestle had to be constructed before the gap could be closed.

Adjacent to this bridge were the concrete piers for a new bridge to replace it, being built in connection with track elevation work through Piqua. These new piers were not damaged, but the contractor's outfit engaged in the work was badly wrecked by the flood.

Bridge No. 58, west of Gettysburg, over Middle Creek.

Stone arch bridge, 18 foot span, completely destroyed.

Temporarily replaced with cribbing and frame bents. Will be replaced with 30 foot arch.

Bridge No. 64, west of Weavers, over Mud Creek.

West abutment undermined. Bridge supported temporarily on timber bents.

Bridge No. 92, west of New Paris, over East Fork White River.

Abutments and pier practically destroyed. Superstructure for one track in river, had to be replaced with pile trestle; superstructure for second track supported on timber bents. Bridge to be replaced with through truss bridge with thirty feet longer span.

The road bed was damaged in a great many places, but few of the washouts were serious and most of them were repaired by simply replacing the ballast.

On March 28th, repairs had advanced sufficiently that one track was open over the Division except at Bridge 3, Marble Cliff; Bridge 50, Piqua; Bridge 58, Gettysburg; and Bridge 92, New Paris.

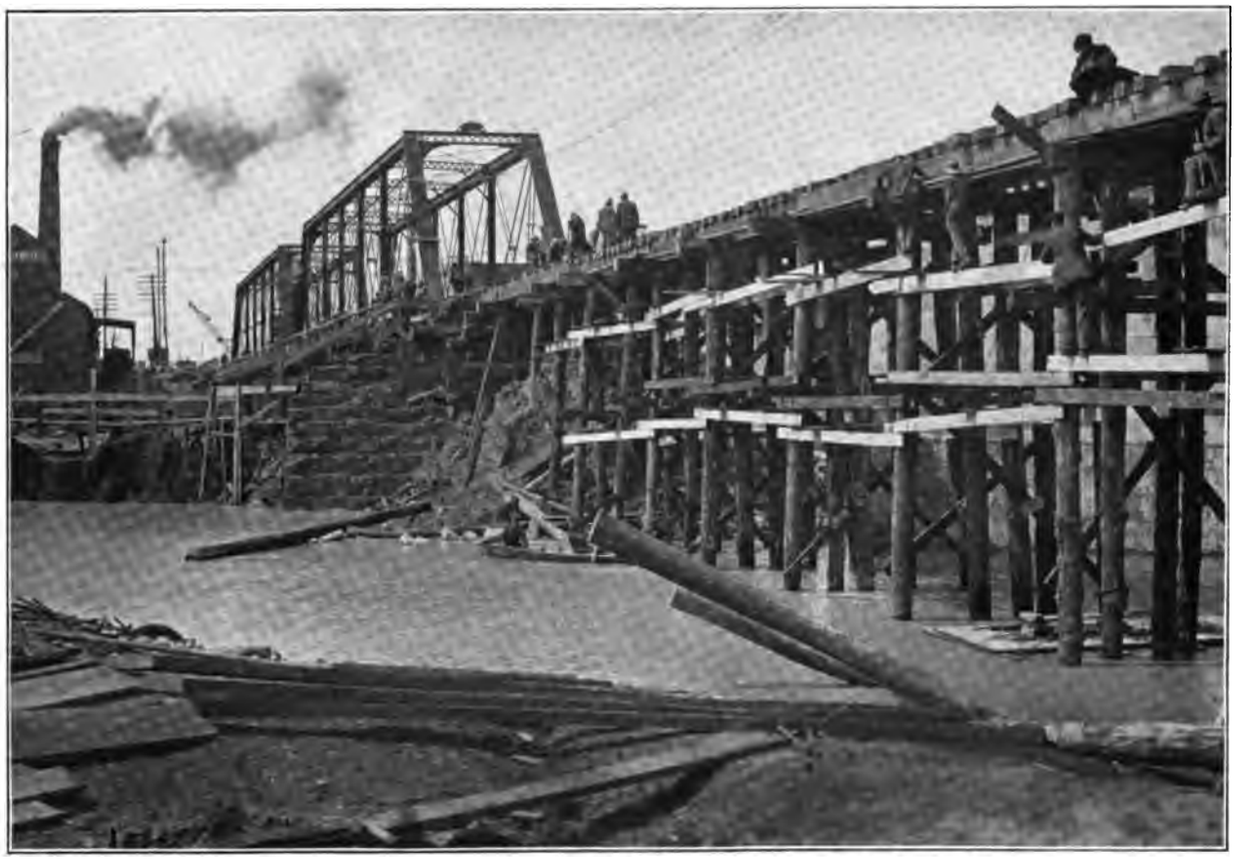
On March 29th, one track was put in service over Bridge 92, and a foot bridge was gotten across the gap at Bridge 50. The passengers from the four eastbound trains at New Madison and Bradford were brought to Piqua, where they walked across Bridge 50 to another train; then to Marble Cliff, where they walked across Bridge 3, over the Scioto; and then to Columbus, arriving about midnight. Thence those for the

Urbana, Ohio, west of. April 2, 1913.

Bridge No. 37, on old line, approaches washed away, abutments undermined.

Urbana, Ohio, 3¼ miles west of. April 2, 1913.

View east at Bridge 39, over Spring Creek, showing undermined abutment.



Piqua, Ohio. April 2, 1913.

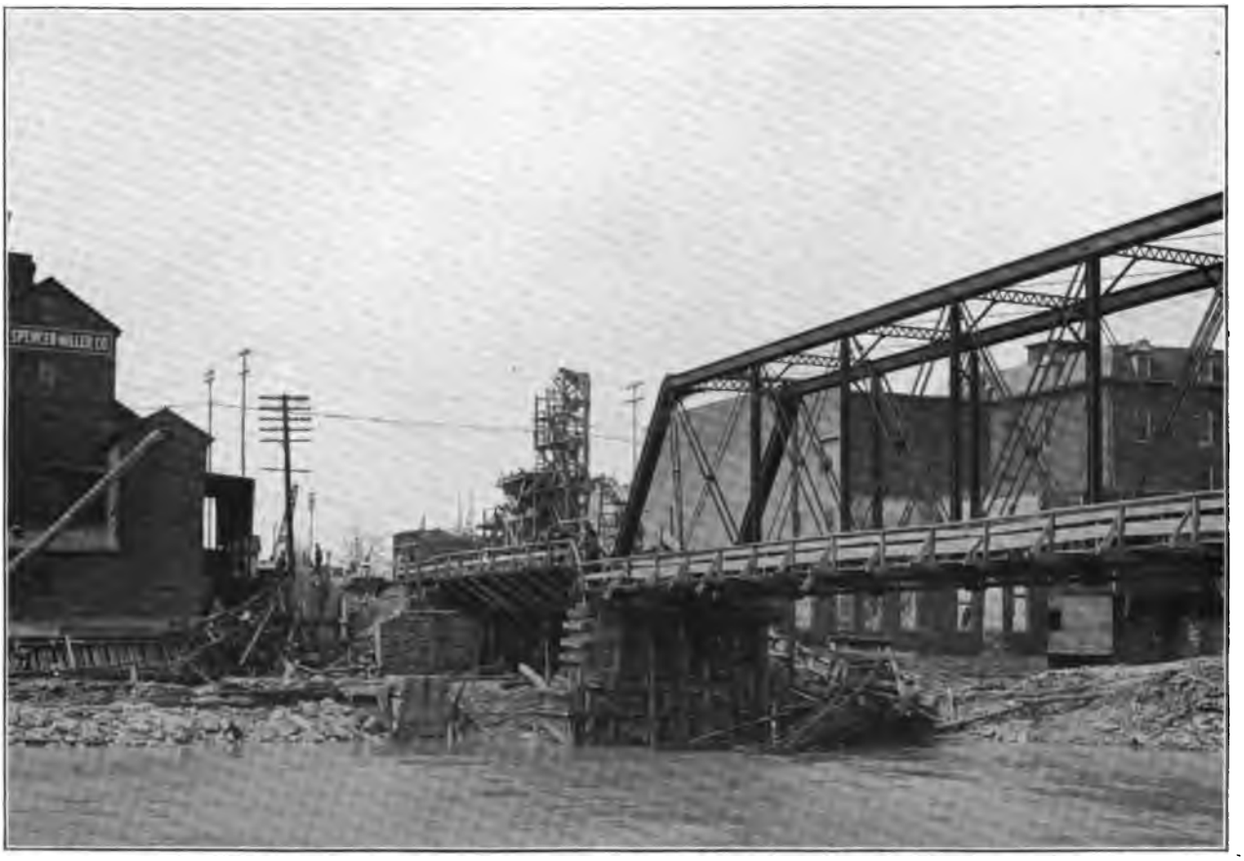
Showing fill at east approach to Bridge 50, over Miami River and Canal, replaced by temporary trestle.

Piqua, Ohio. April 2, 1913.

West approach to Bridge 50, looking north; span over Canal, showing damage to other structures near Bridge 50.

Piqua, Ohio. April 2, 1913.

Looking east from Bridge 50, showing ruins of contractor's outfit engaged in track elevation work.



Piqua, Ohio. April 2, 1913.

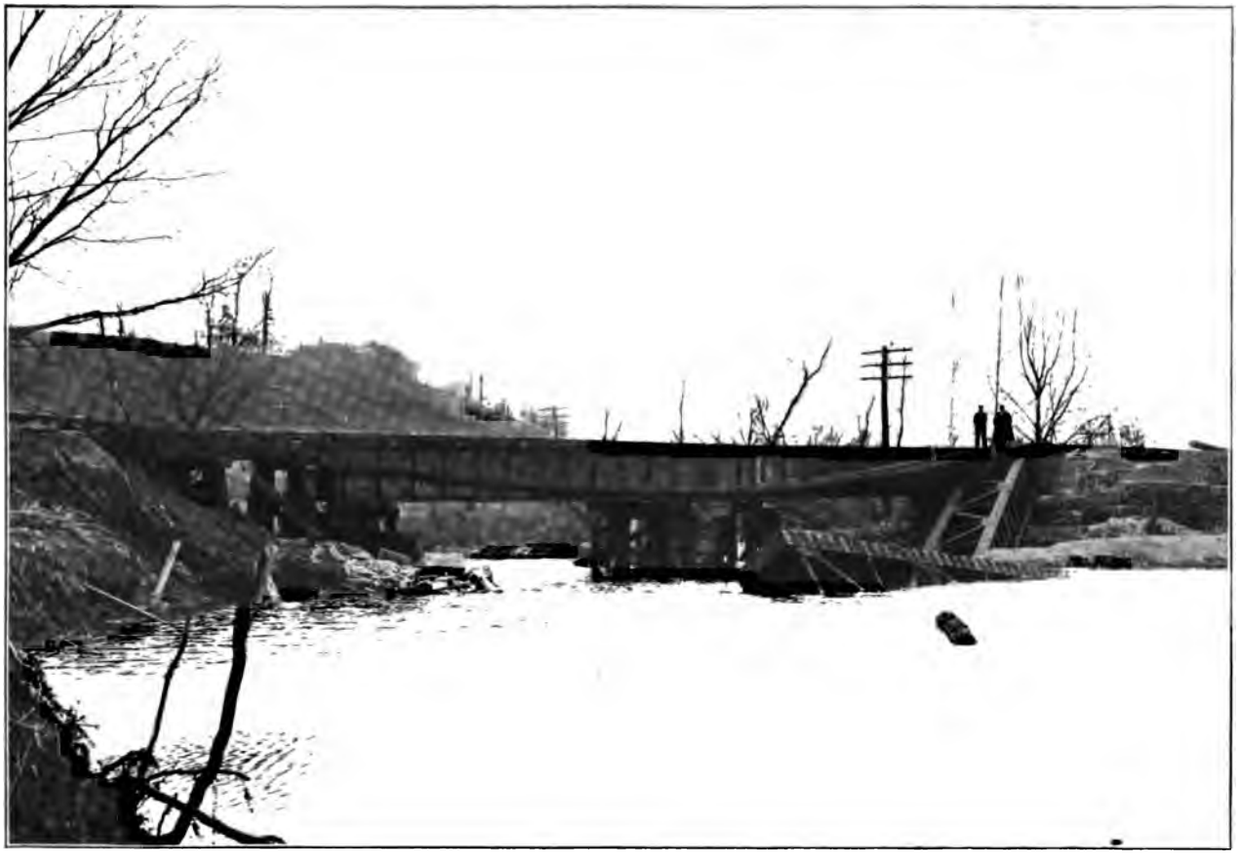
South side of west pier of Bridge 50, over Miami River and Canal. Bridge itself intact.

Gettysburg, Ohio, west of. April 3, 1913.

Bridge No. 58, over Middle Creek, stone arch destroyed. Wrecked cabin car is part of work train started west from Bradford on the morning of March 25 to another break, under which this bridge went down. A foreman and five men were drowned.

Weavers, Ohio, west of. April 3, 1913.

Bridge No. 64, over Mud Creek, south abutment undermined.



New Paris, Ohio, west of. April 3, 1913.

Bridge No. 92, over East Fork, White River, looking north. Double track bridge built as two separate structures, one of which was destroyed; other only damaged.

New Paris, Ohio. April 3, 1913.

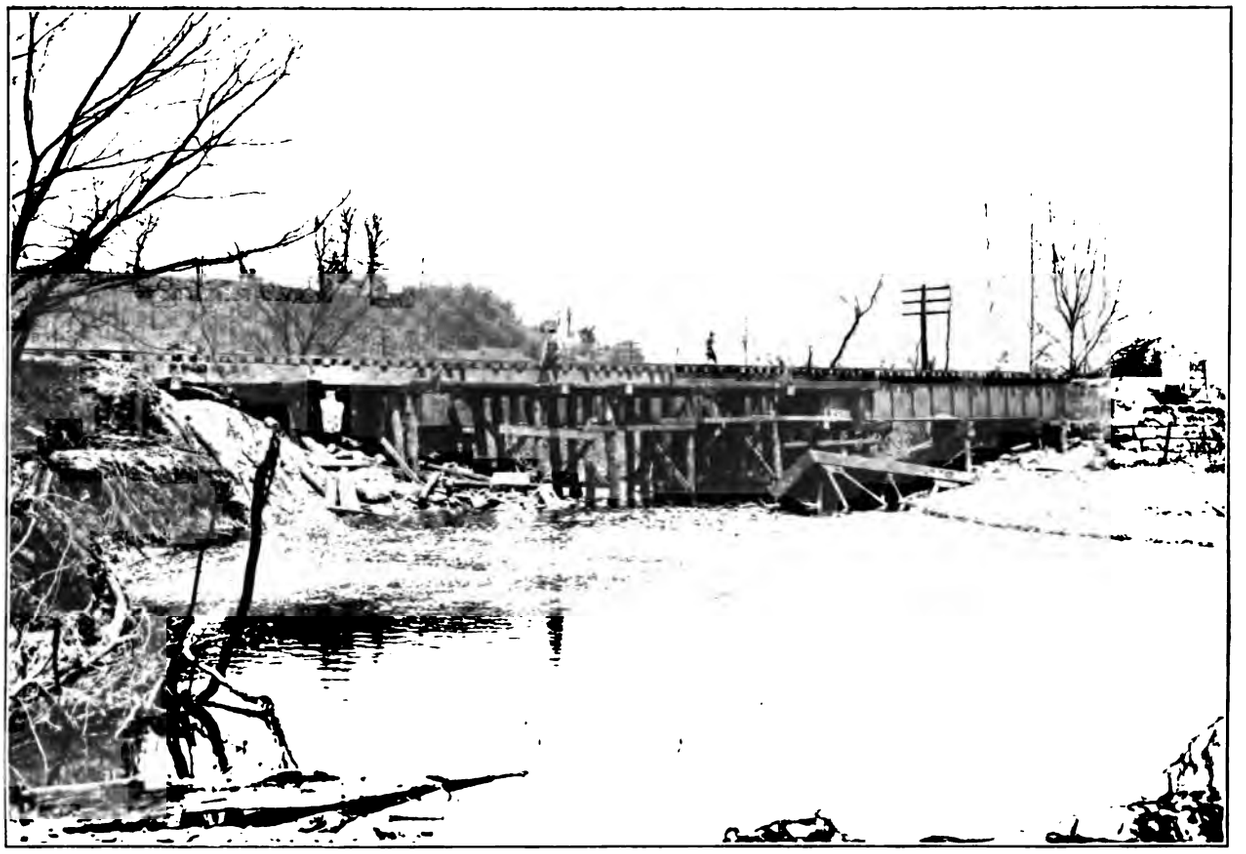
Bridge No. 92, over East Fork, White River, showing one track replaced for slow speed service, the other without support.

east were taken over the Big Four to Crestline, the Ft. Wayne to Mansfield, the Erie to Akron, and the C. & P. and Ft. Wayne to Pittsburgh. Passenger service was resumed over the Division with these two transfers, and all the marooned passengers gotten on their way again. On April 2d, a track was gotten through Piqua, and a detour line was secured from Mounds to Columbus, over the T. & O. C. and Big Four, putting an end to the transfers, so that business could be resumed over the whole Division.

When the Big Four put a pile trestle in place of their bridge which went down with No. 3, at West Liberty, they drove piling through the trailer and ash pan of the engine, which made it impossible to lift the engine until the piling could be withdrawn. This involved reconstructing part of the trestle, and it was not until August 12th that an attempt was made to recover the engine. This attempt was made by one Pennsylvania Lines and one Big Four wrecking derrick, but the bed of the Big Four derrick broke under the load, and a second Pennsylvania Lines derrick went to the scene, and on the following day the engine was recovered and the bridge spans lifted. Notwithstanding its four and a half months immersion, the locomotive was found in shape to repair and put back in service.

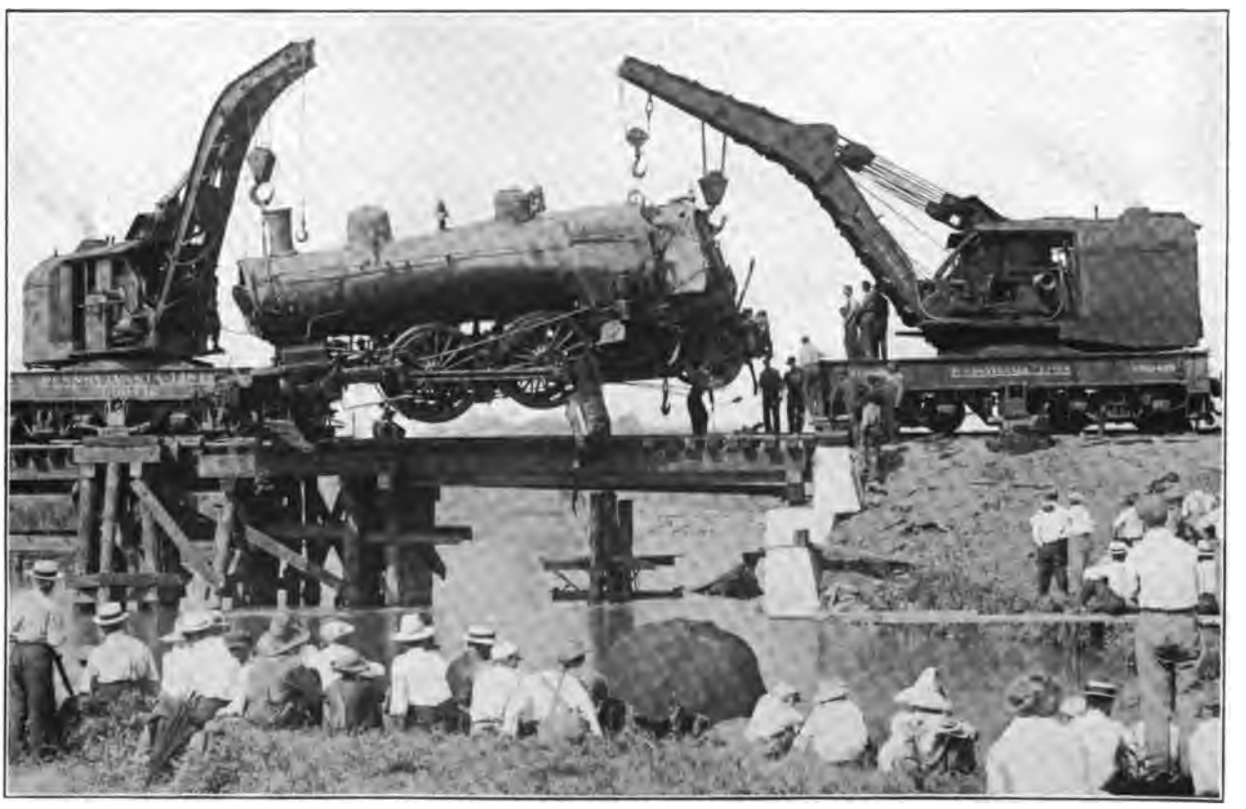
Piqua, Ohio. April 24, 1913.

Bridge 50, over Miami River and Canal, looking north, showing temporary strengthening; piers for new bridge in connection with track elevation work, behind existing structure.



New Paris, Ohio, west of. April 25, 1913.

Bridge No. 92, over East Fork White River (separate structures for two tracks), with girders of north bridge supported on timbers, and part of south bridge replaced with temporary trestle.



West Liberty, Ohio. August 13, 1913.

Recovery of engine of No. 3 of March 24-25 from Mad River at West Liberty, Ohio (Big Four Railway). Piling for temporary bridge had been driven through trailer and ash pan of engine, and it could not be raised until these piling could be withdrawn.

CHAPTER 21.

CINCINNATI DIVISION.

Dayton, Ohio, where the Cincinnati Division crosses the Miami River, was the greatest sufferer from the flood. Ninety-eight lives are known to have been lost, and a number of persons have not been accounted for since the flood. The total property loss has been officially estimated at from $100,000,000 to $130,000,000. Dayton was therefore the center of public interest and relief effort all through the flood period, although many other towns suffered equally in proportion to their size.

On the line of the Cincinnati Division between Columbus and New Paris, via Xenia, Dayton was the only point where serious damage occurred, but on the Little Miami road from Xenia to Cincinnati, most of the track was under water and much of it was seriously damaged, as the tracks lie low in the valley of the Little Miami River for most of the distance.

On the night of March 24th, No. 301 was stopped at New Paris by washout of Bridge 92 on the Indianapolis Division, and before the train could be started back, washouts behind it at Brinley and West Sonora blocked the road, so that it had to stay at New Paris. No. 13 was at Dayton, and the C. H. & D. were asked to detour it to Hamilton, from which point it was planned to take it to Richmond over the Richmond Division. Before the train could be started the C. H. & D. line was broken; and the Big Four was asked to take it to Cincinnati and Indianapolis over their line, but just as the train was ready to leave this line was broken, and No. 13 was caught at the Dayton Union Station by the rising waters.

At Dayton the Miami River is joined by Mad River and Stillwater River, and the city is built on level ground surrounding the junction of these rivers, only a part of the residential section being on the surrounding higher ground. These rivers have a rapid fall toward the city, and the valley which takes their united waters south, the Great Miami River, is comparatively narrow. All these streams were soon filled to overflowing and the erosion of the levees was very prompt. The city was inundated in an incredibly short time. Forty minutes from the time the water reached Main Street it was six feet deep in the stores, and continued then to rise gradually until it was twelve to fifteen feet deep all over the city. Most of the inhabitants were caught in their places of business or in their homes, and were almost immediately driven from the ground floor rooms. A considerable portion of the residence section west of the river was built up of one-story dwellings, and many of the people caught in them saved their lives only by breaking their way through the ceilings and then the roofs, and thousands were marooned on roofs and in attics for two or three days. The weather was cold and on the morning of the 27th there was considerable snow, and the exposure was awful.

All means of communication were cut off and only rumors could be had as to actual conditions. Fire broke out in many places in the town and destroyed two whole blocks

Dayton, Ohio. March 25, 1913.

Second and Main Streets, water not yet at highest. Department store flooded.

Miami City, Ohio. March 26, 1913.

Bridge over Wolf Creek, No. 221, showing debris lodged against bridge.

in the heart of the city. While rain prevented the spread of flames in the residence section, and but few dwellings were burned, the report that the city was afire, with the inhabitants cooped in the buildings and without means of fighting for their lives, filled the country with horror.

On the 26th, the water was still too high everywhere to permit of any repair work on the Division, and the time was spent in preparation for work as soon as conditions would permit.

On March 27th, the Weather Forecaster at Cincinnati predicted that the following day would find the water so high in the Ohio River as to force the abandonment of the terminal at Pendleton Shop. Arrangements were therefore made for a temporary terminal near the Terrace Park gravel pit, for use of work trains, and during the day the work of repairing tracks at points where the water had receded sufficiently was gotten well under way.

In the meantime, it had been definitely ascertained that all or a portion of the Dayton Union Bridge over the Miami River had been swept away. The bridge being joint property, and all available equipment being needed elsewhere, it was arranged that the Big Four should take charge of trestling the river, and they commenced work on the 30th.

On the 28th, the Ohio River at Cincinnati continued to rise, while the other rivers fell to about usual flood stage.

For the relief of Dayton's need, a force of mechanics was organized at Columbus Shop and sent to Dayton to assist the authorities in whatever might be most needed. They were equipped with provisions for five days, and such tools as it was thought might be useful. Upon their arrival in the evening, they found that under martial law no one could stir from 6:00 P. M. to 6:00 A. M. and they did not get an assignment until the morning of the 29th, when they were asked to assist in restoring water and light facilities. The city pumping and power plants, which had been submerged, were filled with debris and from six inches to a foot of mud covered the floors, machinery, dynamos, etc. The buildings had to be cleaned first with shovels and wheelbarrows, the machinery taken apart, cleaned, and reassembled. By 10:00 A. M. of the 30th, pumps were started in the water works, and as the source of supply was wells, which had not been contaminated, water was soon available wherever the mains had not been broken. By evening of the same day, the 4th Street electric light plant had been restored to service. On the 31st, a gang worked on the Third Street electric plant, until they were released about 3:00 P. M., while another gang assisted in replacing bridges. At evening it was found that they could be of no further practical assistance and returned to Columbus.

About this time, it was learned what had become of the passengers on No. 13, which had been marooned at the Dayton Union Station. The train arrived at Dayton 11:42 P. M., March 24th. The water entered the train shed at about 7:45 the next morning, in such volume that it was seen to be impossible to get the passengers out of the train, and it was accordingly pulled west toward the bridge, where the tracks are several feet higher. A Big Four train also pulled alongside. About 4 P. M. the water came up to the floor of the sleeping cars, and debris lodging under No. 13 prevented moving it. As the water was still rising, the passengers and baggage were transferred to the Big Four train, which was backed to the station and the passengers and fifty-six persons who had been rescued from floating houses, trees, etc., were assisted from the

top of the train to the roof of the train shed, and so to the second story of the station, where there were two store rooms. Here they remained until the water went down enough on the afternoon of the 26th to permit of getting them down to some coaches in the station which could be warmed. On Thursday the 27th, it was possible to heat No. 13's cars, and the passengers were taken back to the train, but about four o'clock in the afternoon, word was received that a reservoir above the city had broken (which, however, proved untrue), with a warning to take to the hills at "Dayton View," which could only be reached by climbing over the debris for a long distance. Most of the passengers followed this advice, and at Dayton View were fed and housed by the relief committees. The crew and such passengers as were too old to make the trip remained on the train, where the station building was available as a refuge. A part of the passengers returned to the train on Friday the 28th and on Saturday evening were taken to Xenia after the crew cribbed up the track sufficiently to permit moving the train. An attempt was made to get them east to Columbus on Sunday by a detour route, but they got only a few miles and had to be returned to Xenia. On Monday the 31st they were taken back to Columbus, the last three miles being made by carriage.

On March 29th, 30th and 31st, the work of repairing the line in the valley of the Little Miami River continued, one train working from either end. The one from the north, having very little filling material available, was able only to block and crib up the track in shape for work train service, while the work on the south end was completed as the train advanced, material from Terrace Park gravel pit being available. The two gangs met on April 1st and the road was open throughout for work trains, but the track north of the meeting point was soon put in shape, and during the night of April 2d passenger train service was resumed. As the Ohio River at Cincinnati was now at its crest, with water in the station and over the tracks to Indian Hill, service between Middletown Junction and Cincinnati was performed over the C. L. & N., which had not at any time been put out of commission.

The Ohio reached its maximum height of 69.8 feet on the morning of April 1st, there being then 19 inches of water in the waiting room at the Cincinnati Union Station. As all equipment, baggage, freight, etc., had been moved to high ground and the platforms at the various passenger and freight stations anchored, there was comparatively little damage. By the 3d the water had gone down enough to start the work of cleaning out the station and clearing the tracks and right of way of mud and debris, and passenger service into the station was resumed on April 5th.

On the night of April 8th trestle for one track was completed over the Miami River at Dayton, by the Big Four forces, and through passenger service was resumed. Work was then started on trestling for a second track across the river, which was completed on April 26th.

Cincinnati, Ohio. March 31, 1913.

Union Station Yard, from Point Isabella. Train shed in distance at right of center.

Cincinnati, Ohio. March 31, 1913.

Ludlow and Front Streets, looking west, at Broadway Yard and Fruit Auction House.

Dayton, Ohio. April 1, 1913.

Damaged levee on Mad River, showing town level below usual high water level in the stream.

Dayton, Ohio. April 1, 1913.

Typical view in West Side, showing debris left in and around residences that were not themselves destroyed.

Dayton, Ohio. April 1, 1913

View of joint tracks just west of Dayton Union Bridge. Similar conditions existed east of the bridge, also, for a mile.

Dayton, Ohio. April, 8 1913.

Entrance to Union Station, at east end, showing high-water record on columns. The broken lamp post is typical of destruction of lighting facilities, except that this post has been turned to up-stream side of its stub to clear the driveway.

Dayton, Ohio. April 8, 1913.

Dayton Union Bridge, over Miami River, looking east, showing temporary trestle for one track replacing destroyed spans.

Dayton, Ohio. April 8, 1913.

Dayton Union Bridge, looking west, showing west spans, which had been destroyed, replaced with temporary pile trestle, for one track.

CHAPTER 22.

RICHMOND DIVISION.

Although the Richmond Division was one of the first to feel the effects of the flood, it was not repaired as promptly as its own conditions would have permitted, because it was felt more important to open up first the through lines from east to west, and as the damage between Richmond and Piqua could not be reached from the east, the forces of the Richmond Division were sent there before making repairs on their own Division.

On March 24th high water began to cause trouble, but the slight damage done was repaired within a few hours. About 2:00 A. M. on the 25th, Bridge No. 81, over a ditch west of Campbellstown, was washed out on one side so that the deck girders went down at one end, and the line was broken. Three passenger trains, Nos. 45, 1, and 9, were behind the work train when this point was reached. In the early morning the passengers on these trains were transferred across the damaged bridge and taken to Richmond.

During the day Seven Mile Creek, in the valley of which the Richmond Division lies from Eaton, Ohio, south to Hamilton, rose to an unprecedented height, destroying three bridges and considerable track in that district. Telegraph lines were destroyed at the same time, so that it was impossible to ascertain exact conditions. The Great Miami River at Hamilton likewise came up on the 25th to an unprecedented height, and flooded almost the entire city. Here the damage done was even greater in proportion to the size of the town than at Dayton, and the number drowned was almost as great, the total deaths due to the flood being 85. The C. H. & D. bridge over the Miami River, which is used jointly by the Pennsylvania Lines, was the only bridge left standing across the river. Water was seven feet deep in the waiting room, and as it came up without warning, a large amount of freight in the freight house and cars was destroyed.

On the 26th, Bridge 81 was repaired for temporary use, and the carpenters sent south to Bridge 57, a two span truss bridge over Seven Mile Creek, west (or north) of Somerville, the pier and one abutment of which had been undermined and destroyed, the steel superstructure dropping into the creek. Before much progress could be made at this point toward building a run-around track, the men were sent to Bridge 92, on the Indianapolis Division west of New Paris, which they succeeded in opening for traffic on Saturday March 29th. From here they were sent to Bridge 50, at Piqua, from which point they did not return until April 2d.

In the meantime, a gang of bridge carpenters from the Chicago Terminal Division had arrived and started work on the 30th at Bridge 57. They were joined by the Richmond Division gang on April 2d late in the afternoon, and the trestle was completed on April 7th, a day having been lost in returning to Bridge 92, west of New Paris, which was damaged by high water following heavy rains on the 3d.

On the 2d of April, a land pile driver, which had been used in making the first repairs at Bridge 92, was taken to Camden, and from there hauled by wagon to Bridge No. 48, a two span through truss bridge over Seven Mile Creek, the pier of which had been

Campbellstown, Ohio, west of. April 4, 1913.

Bridge No. 81, looking south, showing damaged masonry.

Somerville, Ohio, west of. April 4, 1913.

Bridge No. 57, over Seven Mile Creek, looking southwest, showing abutment and pier destroyed, and temporary run-around trestle being constructed.

Somerville, Ohio, west of. April 4, 1913.

Bridge No. 57, over Seven Mile Creek, showing pier undermined and east abutment destroyed.

Somerville, Ohio, east of. April 4, 1913.

Bridge No. 48, over Seven Mile Creek, looking north, showing pier undermined.

Somerville, Ohio, east of. April 4, 1913.

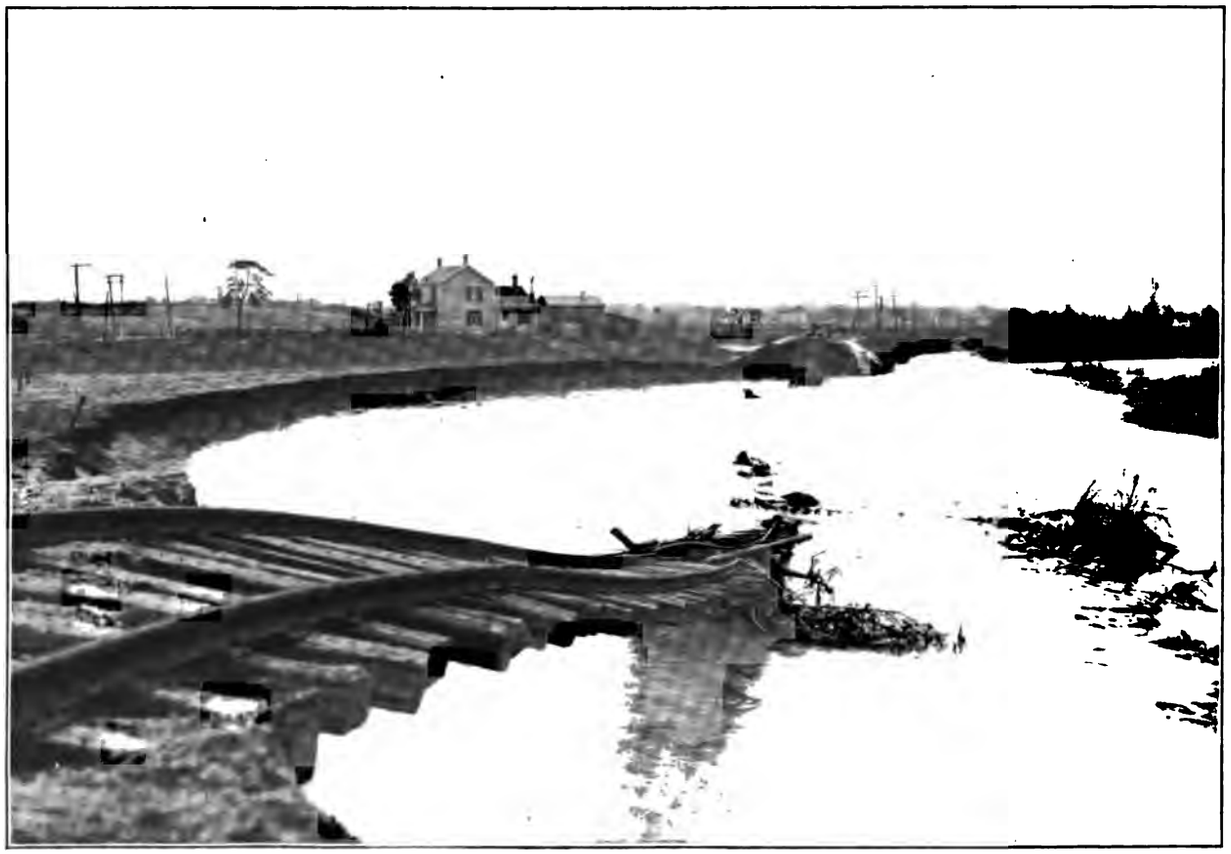
Near view of undermined pier and resulting damage to superstructure of Bridge No. 48, over Seven Mile Creek.

Collinsville, Ohio. April 4, 1913.

Bridge No. 44, over Seven Mile Creek, looking east, showing pier undermined.

Collinsville, Ohio. April 4, 1913.

Bridge No. 44, over Seven Mile Creek, looking east, showing deflection of Bridge due to undermining of pier.



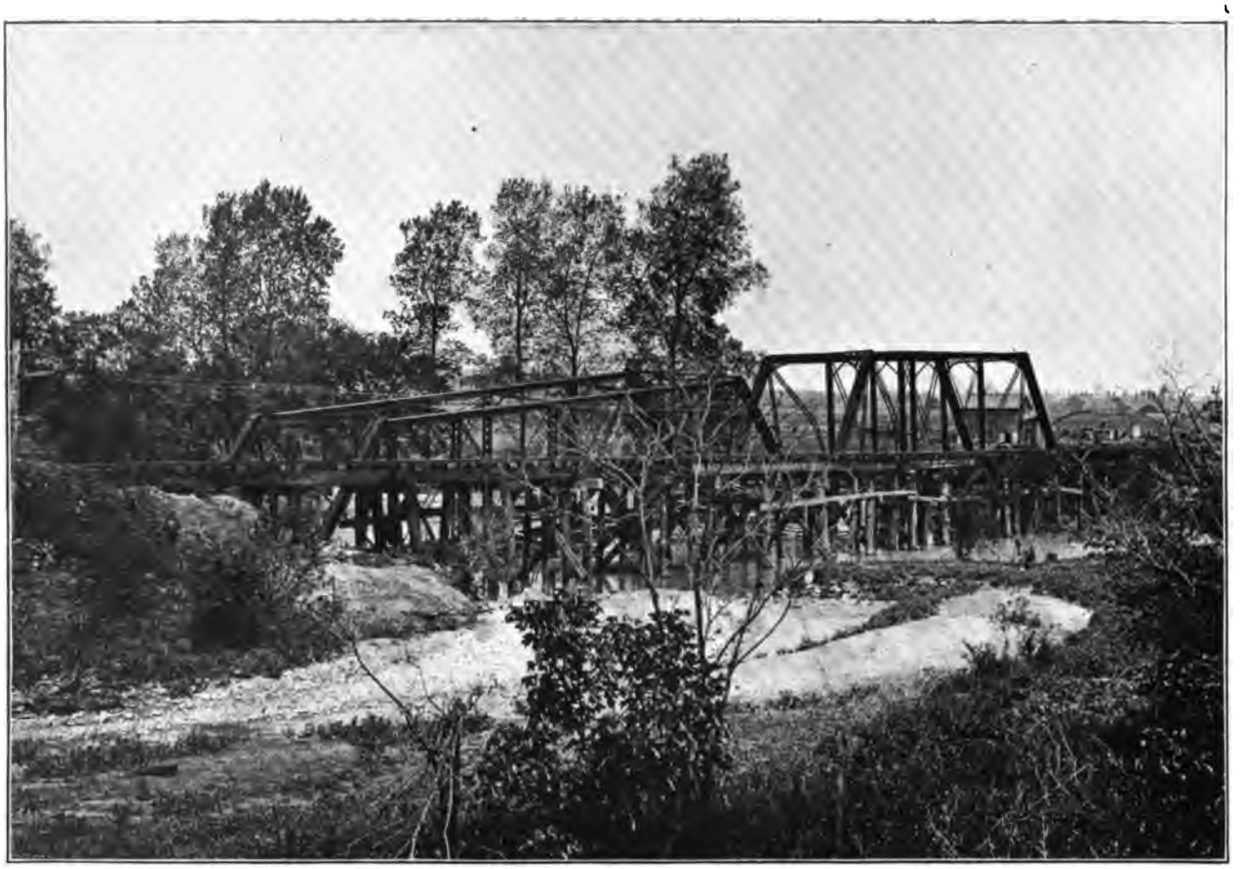
Collinsville, Ohio. April 4, 1913.

Looking west over washout one-half mile east (south) of Collinsville, along Seven Mile Creek.

undermined, letting the steel work down. When Bridge 57 had been replaced, the pile driver which had been there was taken to Bridge 48, to work from the opposite end, and this trestle was completed at 5:00 A. M. April 10th.

An Indianapolis Divison gang with piling and timbers arrived at Bridge 44, on April 5th. This is a two span through truss bridge over Seven Mile Creek near Collinsville, Ohio. In this case the pier had been undermined, but settled only about two feet toward the north, where a firm bearing remained, and the superstructure was jacked up and supported on blocking on the pier and pile bents under panel points. When the bridge had been made safe for the passage of a work train, this gang proceeded over it to a bad washout requiring trestling between the bridge and Collinsville, work on which was started on the 7th.

A gang from the Cincinnati Division arriving on the same day completed the work on Bridge 44, and another from the same Division went to the washout just north. Two gangs from the Logansport Division arrived on the 7th also, at Bridge 48, where trestling was completed at 5:00 A. M. April 10th. This pile driver then went to the washout at Collinsville to work from the opposite end, and the gap was closed at 10:00 A. M., Saturday, April 12th, restoring the entire Division to service, the minor washouts and damage having in the meantime been all repaired.



Camden, Ohio, east of. May 14, 1913.

Bridge No. 57 over Seven Mile Creek, looking south, showing temporary trestle replacing bridge.

Somerville, Ohio, east of. May 14, 1913.

Bridge No. 48, over Seven Mile Creek, looking east, showing temporary trestle replacing Bridge.

Collinsville, Ohio, east of. May 14, 1913.

New fill replacing former embankment, about completed.

Collinsville, Ohio, east of. May 14, 1913.

Bridge No. 44, over Seven Mile Creek, lifted from undermined pier and supported temporarily on piling and blocking.

CHAPTER 23.

LOGANSPORT DIVISION.

The Logansport Division encountered serious trouble at Logansport and Muncie. At other points there was minor damage, but delays to traffic resulted from the high water at these two points only.

At Logansport, the Division crosses the valley of the Wabash River, all tracks, buildings, shops, etc., being in the immediate river valley. At 3:30 A. M., on March 25th, the water reached the tracks at the passenger station, continuing to rise until about noon on the 27th, when there was seven feet of water in the waiting rooms. The lower floor of the station had to be abandoned at 5:00 A. M. on the 25th, the freight house at 8:00 A. M. and the entire shop plant by 1:00 P. M. The Division offices are located in the second floor of the passenger station, and the Division officers, dispatchers, and others who were able to get into the building in the morning, were marooned there until about noon on the 26th, when boats had been secured from Chicago and brought to the west end of the city for rescue purposes. Division headquarters were then established in the Vandalia station and office building on the northwest side, which was above water.

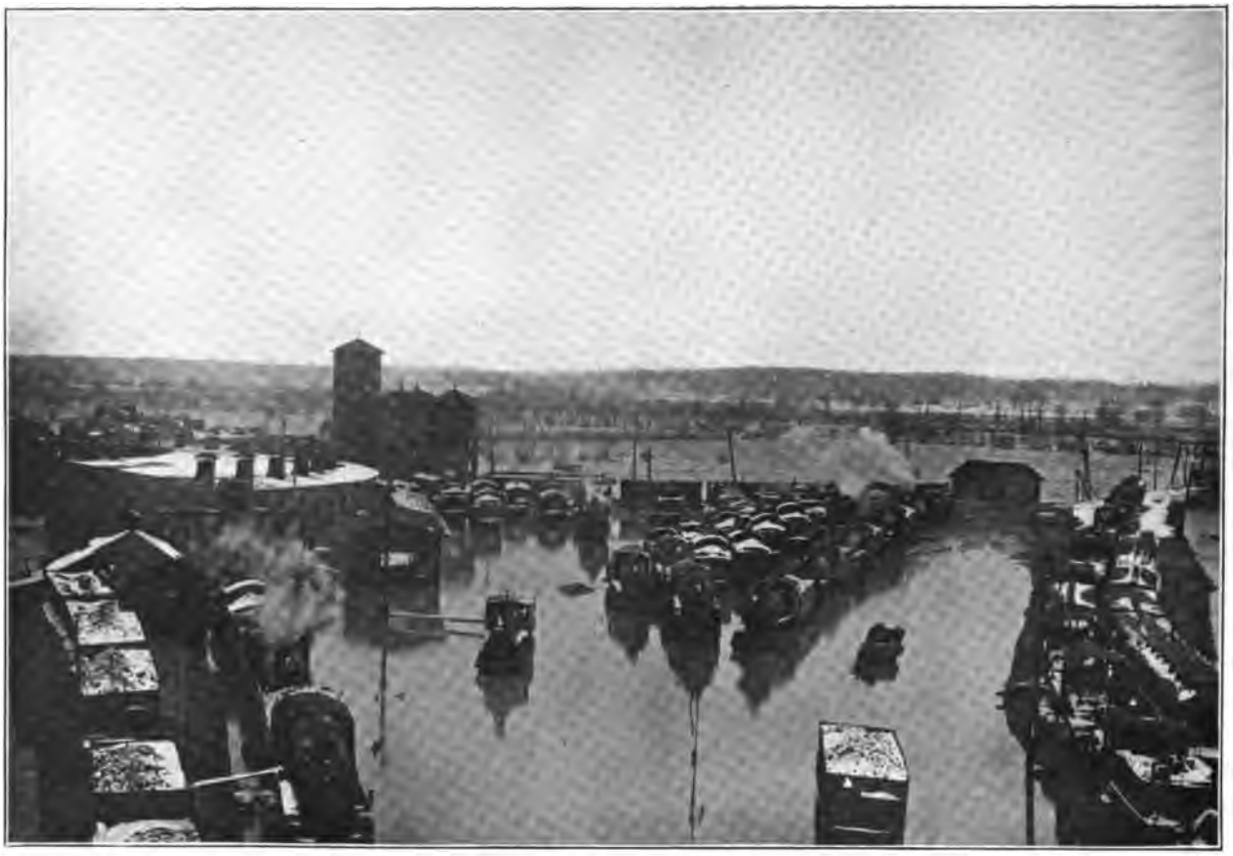
One passenger train—Louisville-Chicago No. 9—was marooned at Logansport. Passengers were cared for in the train and fed at restaurants until the water compelled them to seek higher ground. Most of them left on the afternoon of the 26th for Chicago, being taken in busses to the west end of town, trains from Chicago being able to get into the town on the old line as far as Bates Street.

A city bridge and a trolley bridge over the Wabash River, one block west of the passenger station, went out on the 26th, about 2:00 A. M., breaking down all wires. The water flooded the Western Union Offices, and cut off the battery supply for such wires toward the east as were not broken, so that they were useless, and communication was entirely shut off. Rumors went broadcast of great loss of life, but they were later found to be without foundation. (See account of provision of rescue boats under Chapter on Vandalia Railroad.)

The water reached its highest about noon on the 27th, and shortly after began to recede rapidly, so that by 9:00 A. M. of the 28th the railway property in Logansport and vicinity was practically free of water. The main damage was found to have been to the machinery and tools in the shops, which were covered with mud; to the ice house and its contents, which were washed away; and to freight in the house and cars, much of which was washed away or ruined.

On the 29th, the tracks had been put in shape for use and passenger service through Logansport was resumed.

At Muncie, one pier and one abutment of the bridge over the White River were undermined, and two of the three spans, and the loaded cars which had been placed on them, went into the river. Passengers were taken to and from the station in carriages, and passenger service was not stopped by the loss of the bridge. A frame trestle replaced it, completed on April 10th.

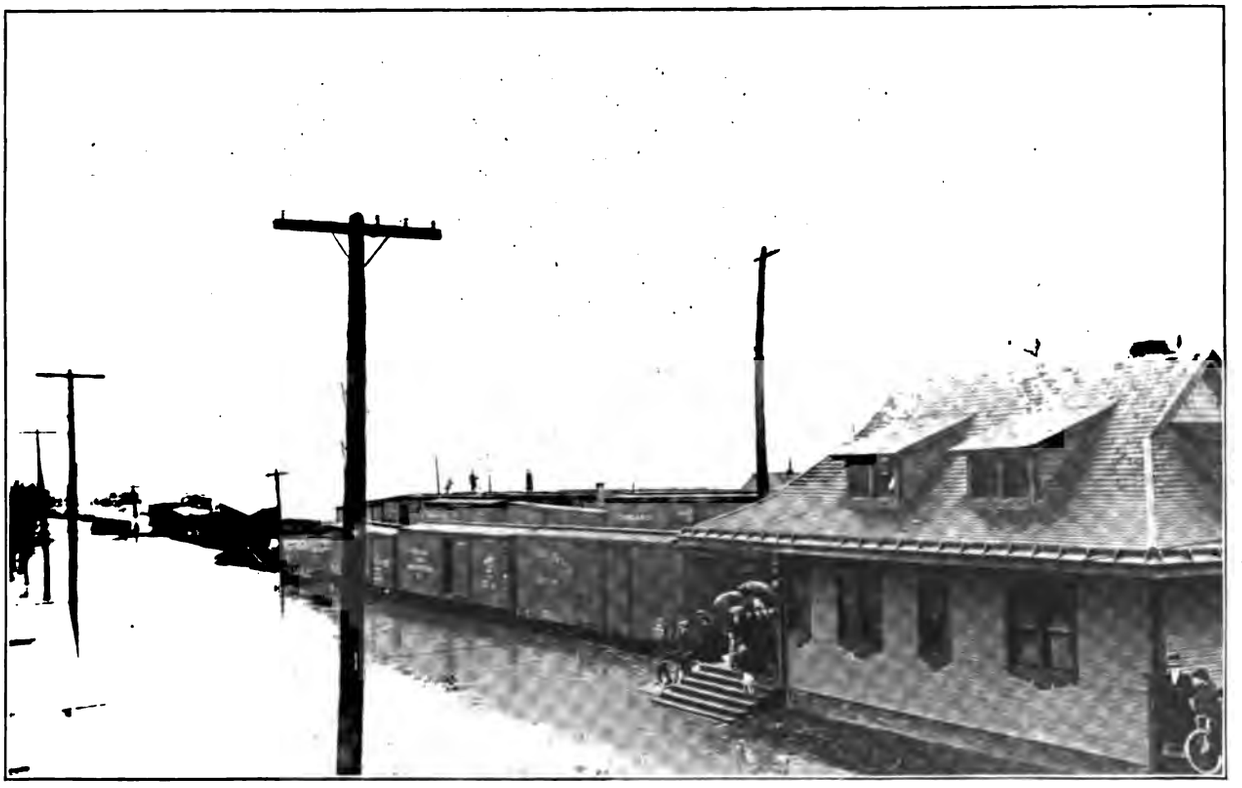


Logansport, Ind. March 27, 1913.
Enginehouse and tracks in shop yard near old Wabash River Bridge.
Water had fallen a foot or two.

Logansport, Ind. March 28, 1913.
Passenger Station after water had receded about 10 feet. Water had been three inches above the lower belt of light colored brick. The Third Street city bridge and a trolly line bridge spanned the river just beyond the shed left on the tracks.

Muncie, Ind. March 27, 1913.

Pennsylvania Lines Bridge over White River, in foreground. Chesapeake & Ohio Bridge to the right.



Muncie, Ind. March 27, 1913.

Pennsylvania Lines Station, and view of tracks to north toward bridge over White River, which was washed away.

CHAPTER 24.

LOUISVILLE DIVISION.

The main line of the Louisville Division parallels the East Fork of the White River and its tributary Driftwood River (or Sugar Creek) from Edinburg south to Rockford, twenty six miles. Into this river flow numerous creeks, several of which are crossed by the Louisville Division or its branches.

On the night of March 24th, heavy wind took down the telegraph wires at a number of points on the Division, and the heavy rains of that night and the following day quickly brought these streams to an unprecedented flood stage. Water was over the tracks during the day (25th), so as to stop traffic at nine places on the main line, four places on the Cambridge City Branch, and three places on the Madison Branch. Work trains attempted to make repairs at such points as they could reach, but on account of the rising water were unable to make much headway.

It was impossible to perform any sort of through passenger service. No. 37 of the 25th got as far as Columbus (Ind.) and was held there. No. 19 got as far as Seymour and was returned to Louisville as No. 36. No. 6 got no farther than Belt Crossing, Indianapolis, and was returned to the Union Station. Nos. 24 and 36 were held at Indianapolis, Local trains on the Madison Branch were run between Madison and North Vernon. All other trains were annulled, and on the following day, the water being still higher, all passenger trains were annulled.

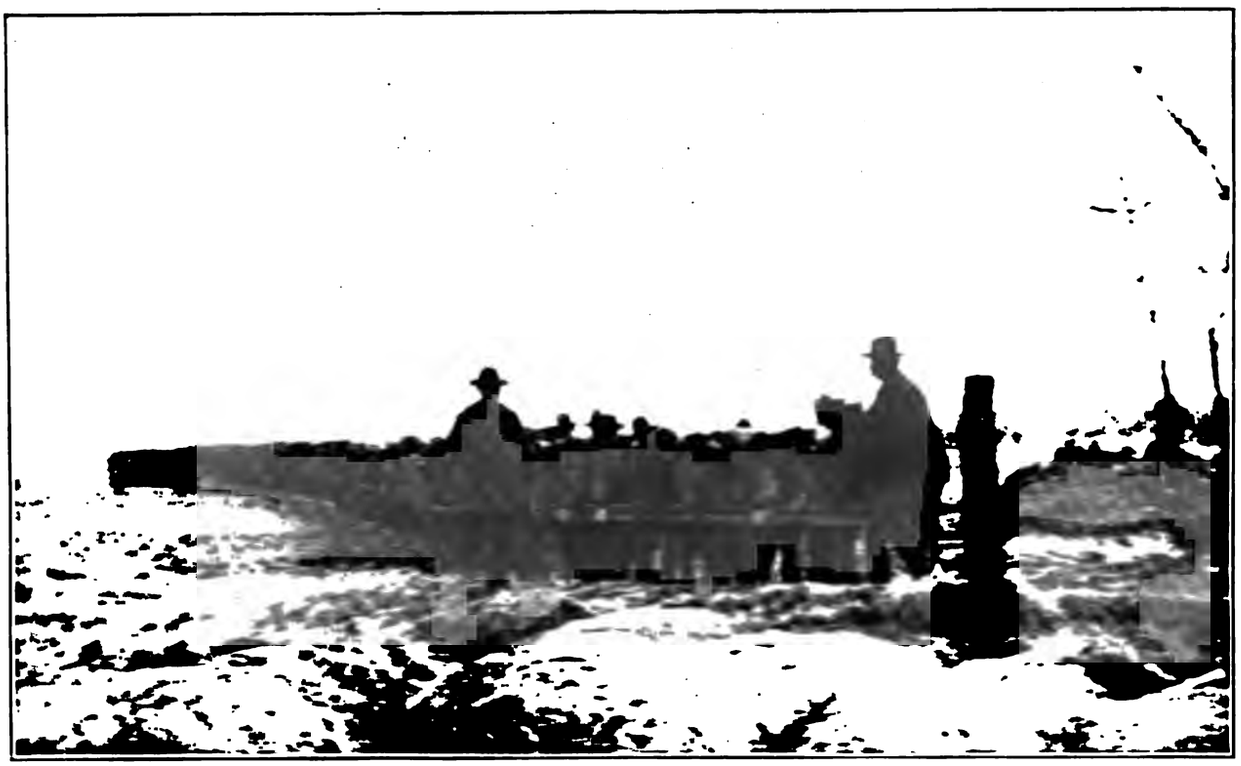
On the 27th, the work trains did what they could, and during that day and night succeeded in getting through minor breaks to the portion of the main line which was most seriously damaged, the twenty-eight miles between Edinburg and Seymour. On the 28th, therefore, it was possible to run local trains between Indianapolis and Amity, and between Louisville and Seymour, on the main line; and between Madison and North Vernon, and Richmond and Shelbyville on the branches.

On March 29th a washout at Edinburg was repaired sufficiently to permit trains to pass, and the line was opened to Columbus (Ind). The Madison Branch having been repaired save for a washout at Clifty Creek, just north of Columbus, it was found possible to get passengers through between Louisville and Indianapolis by transferring at the Clifty Creek gap. This was done by using the B. & O. S. W. from Seymour to North Vernon, and the Madison Branch to Columbus. This gap was closed on the 30th and service between Indianapolis and Louisville was continued by this route until April 11th.

On the 31st, the Ohio River came up so high as to endanger a new fill on the New Albany Branch which acts as a levee protecting almost the whole town of Jeffersonville, including the main line passenger station, freight station and yard tracks. A leak developed around a flood gate in this fill, and all day and night and for several succeeding days and nights, the Company's forces, augmented by a detail of convicts from the Reformatory, near by, which was also threatened, worked with bags of sand and

Edinburg, Ind. March 26, 1913.

Looking north at starch works. Water down four feet. Bridge 18, over Blue River, in distance. Approach and yard tracks badly washed away.



Columbus, Ind., south of. March 27, 1913.

Replacing rail washed from roadbed, without taking time to disconnect the joints.

Jeffersonville, Ind. April 3, 1913.

Reinforcing fill with sand bags, to act as levee protecting portion of town.
Water 20 feet higher on one side of track than other.

Jeffersonville, Ind. April 3, 1913.

Sand bag fill, protected by tarpaulins to prevent washing of embankment, acting as levee protecting portion of town. Water 20 feet higher on one side of bank than other.

cement to hold the water back. This plan was successfully carried out, and when the river was at the highest the water was twenty feet higher on the river side of this embankment than on the town side. When the water reached nearly the top of the fill, high winds caused waves to wash the bank, and it was found necessary to protect it with tarpaulins. Some time later, the Jeffersonville Council passed resolutions expressing their gratitude for the efforts made to protect the town.

Word was received from the management of the Lake Erie and Western Railroad that they expected to be able to open their line between Kokomo and Indianapolis, over which the Louisville Division trains are operated, on April 1st or 2d. They had a bridge down and a serious washout, over both of which pile trestles had to be driven. The Richmond route being open, trains were gotten to Logansport from Indianapolis via Richmond and the Richmond Division until the night of April 2d.

On April 3d the Cambridge City Branch was opened for service by putting a track in the field around a washout near Flat Rock for temporary use, and passenger service between Richmond and Columbus (Ind.) was resumed.

Heavy rains on the 3d washed out the new fill at Haw Creek, just south of Columbus on the Madison Branch, during the night, blocking the road again, and it was necessary all day on the 4th to send passenger trains between Louisville and Indianapolis over the B. & O. S. W. from Seymour to North Vernon and from there over the Big Four to Indianapolis. This new gap was repaired and track made ready for service again on the morning of the 5th.

The track between Columbus and Seymour on the main line was connected through on April 11th, but on account of heavy rain and the softness of much of the new fill it was not put in service until the 12th, on which date regular service was resumed throughout the Division. Partial suburban service between Louisville and New Albany had been resumed on April 8th, but the regular schedules were not attempted until April 15th.

The damage sustained on this division was nearly all to the embankment. Steel bridge superstructures were not injured, and when the fills had been replaced, all that was necessary to make the repairs permanent was the renewal of a part of the masonry for two or three bridges.

Flat Rock, Ind., east of. April 5, 1913.

"Run-around" track in field for temporary service. Cambridge City Branch.

Columbus, Ind., south of. April 5, 1913.

Madison Branch track replaced, and about ready for regular service, after having been washed out a second time.

Edinburg, Ind. April 6, 1913.

View south at starch works, main track supported on cribbing.

Columbus, Ind., south of. April 5, 1913.

Temporary trestle five hundred feet south of Bridge No. 22, over East Fork of White River.

Columbus, Ind., south of. April 5, 1913.

Main line, looking south across Bridge No. 24.

Rockford, Ind., north of. April 5, 1913.

Temporary trestle built south of Bridge No. 37, over Boardley's Hole.

Rockford, Ind., north of. April 5, 1913.

View south on west side of Bridge 37, over Boardley's Hole.

Rockford, Ind., north of. April 5, 1913.

View south from Bridge 35, showing track swept from fill, and fill badly damaged.

CHAPTER 25.
TOLEDO DIVISION.

The only place at which the Toledo Division sustained damage worth recording was Delaware, where the Sandusky Branch crosses the Olentangy River, and follows the bank of the stream through the town, just above usual high water level.

Here the valley is not wide above the town, nor is the drainage area extensive, but just below the town the valley is effectually dammed by a fill carrying the Big Four Railway across the flood plain, a steel girder deck bridge spanning the Sandusky Branch and the river. This fill is from twenty to twenty-five feet in height, and the opening at the bridge was ample for all ordinary floods. But the extraordinary rush of water on March 24th and 25th could not pass through the bridge opening and accumulated back of the fill until it stood fifteen feet higher than ever before, and just about that depth over the part of town lying next the river. All the city bridges were swept away. One pier of the Big Four Bridge went out, and the girders fell into the stream. The force of the water through the bridge opening was so great that these girders were carried several hundred yards down stream, and landed not in the channel of the river but high on the east bank.

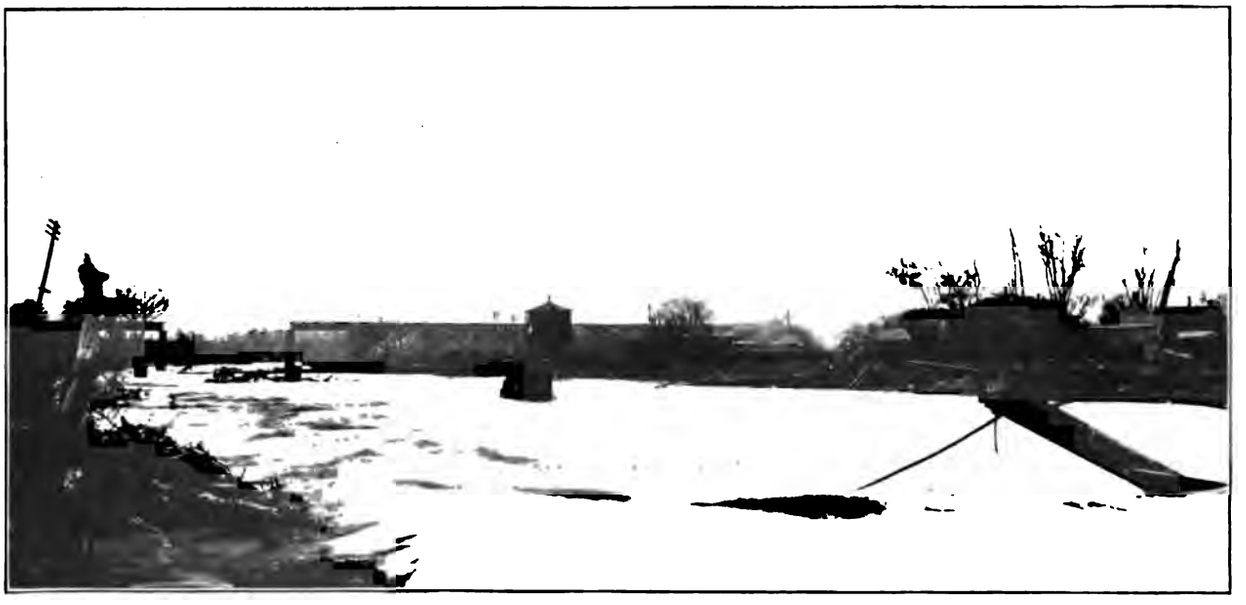
A cable was stretched between the portions of the bridge remaining in place, and the only means of getting from one side of the river to the other for several days was by a basket pulled across suspended from this cableway. The Sandusky Division Bridge over the river remained in place, but as it is about a mile south of town and could not easily be reached, it could not be used for this purpose.

The passenger and freight stations were inundated. Cars on sidings were washed away. A 44 foot trestle was destroyed and the tracks pretty generally torn up through the town, and the right of way covered with debris, but on Saturday the 29th the road was opened through Delaware again, providing an outlet for the passengers who had been waiting at Columbus for a chance to proceed on their journey since the 25th.

Damage was done to the tracks by slight washouts at several points on the Division but this was soon repaired and resulted in no particular delay to traffic.

Delaware, Ohio. March 26, 1913.

Main track of Sandusky Branch of Toledo Division is under the portion of a frame house, lodged against pier of Big Four bridge, spanning Pennsylvania Lines track and Olentangy River.



Delaware, Ohio. March 28, 1913.

Sandusky Branch of Toledo Division being repaired, after crest of flood had passed.

CHAPTER 26.

MARIETTA DIVISION.

For convenience, the Marietta Division may be considered in two separate sections —the main line, from Canal Dover to Marietta, and the Walhonding Branch, from Loudonville to Coshocton. The former was damaged severely at two or three places, while the Walhonding Branch was all but destroyed.

MAIN LINE.

The main line is in the valley of the Tuscarawas River at Canal Dover, for several miles, and crosses it again at New Comerstown. From Guernsey south to Pleasant City, it follows the Wills Creek valley, and from Ava south to Marietta the valley of Duck Creek. Most of the Division, therefore follows the courses of streams, and suffered accordingly.

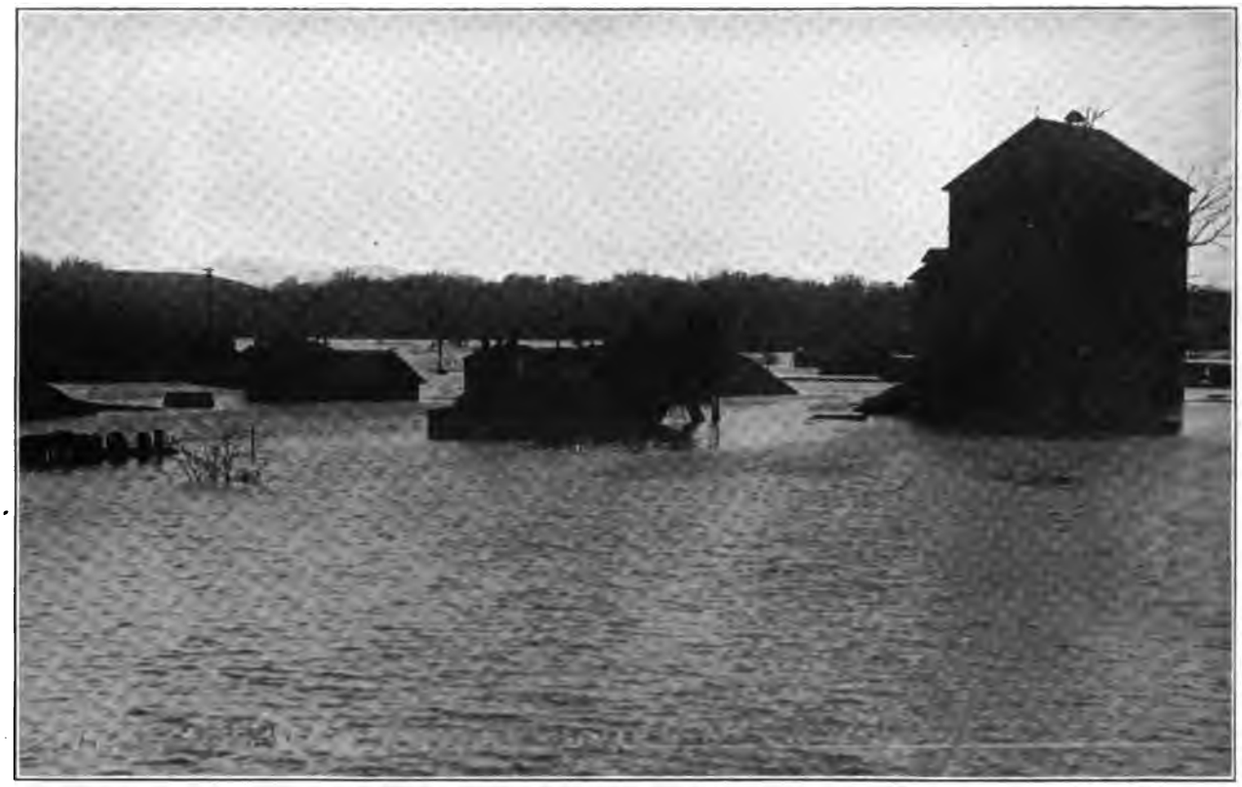
On Tuesday, March 25th, the water rose so high that the work trains sent out could make no headway in making repairs, and washouts and land slides occurred over the whole line. During the night a train of slag ran into an unreported washout near Bird's Run, and the engine was overturned. The wreck train sent out to pick it up could not get to it, nor could it return to Cambridge and was used as a work train until the 31st.

On the 26th, the Tuscarawas River cut out the embankment approaching Bridge No. 27, over that stream south of New Comerstown. In the Cambridge district, Wills Creek covered the tracks about six feet, and considerably damaged the roadbed. There were very few trackmen available in the Cambridge district, and the repairs were made mainly by shopmen and trainmen who volunteered assistance.

By the evening of the 27th, the water had gone down enough in the Tuscarawas at Canal Dover to permit starting repair work at that end, and the line was opened from Canal Dover to New Comerstown on Saturday evening the 29th.

South of Cambridge there had been comparatively little damage, and in the valley of Duck Creek practically none at all.

As the Tuscarawas River receded at New Comerstown, it was found that the east (north) approach to the bridge had been washed out for 150 feet, thirty feet deep, while a longer hole but only half as deep had been made through the embankment at the west (south) end of New Comerstown yard under main and ladder tracks. On Sunday, March 30th, work was begun on blocking up these tracks and making new fill. To permit transfer of passengers over Bridge 27, two wire cables were strung under the ties of one of the swinging tracks, and a third cable strung for a hand rail. Planks were laid between the rails, and a foot-bridge had been improvised over which passengers, baggage, mail and repair material were transferred until the afternoon of April 3d, when the approach to Bridge 27 had been replaced with a pile and frame trestle.

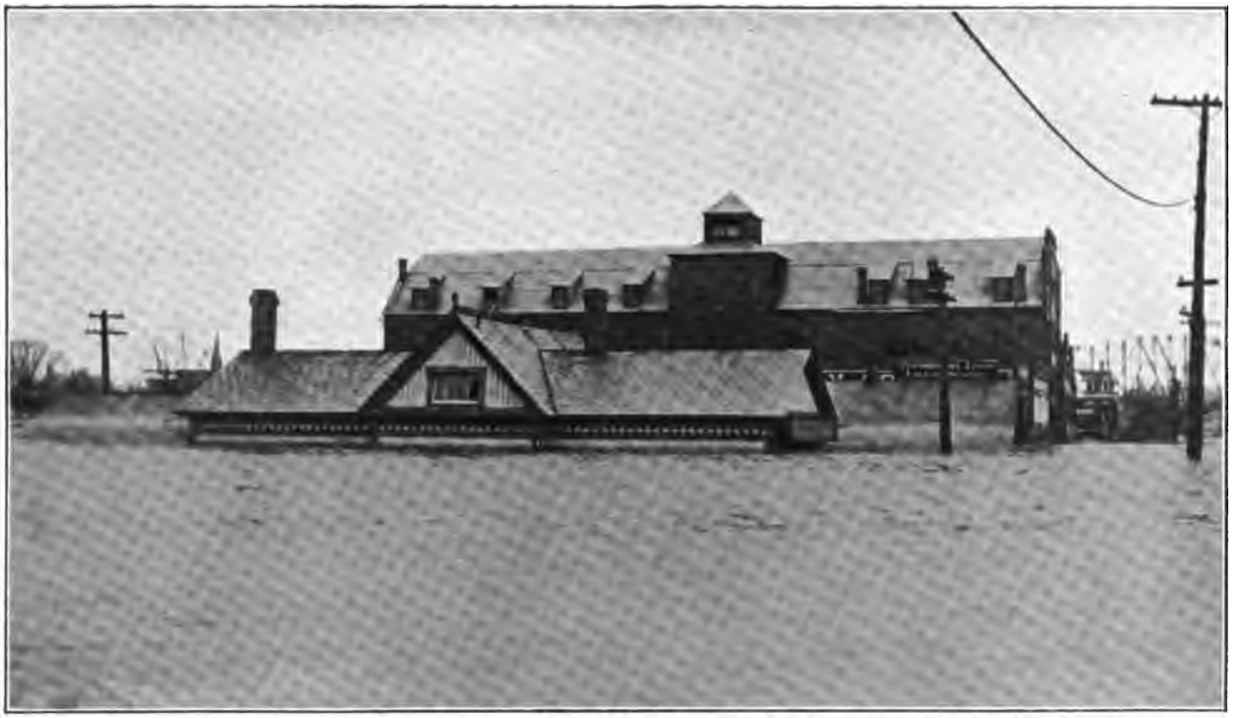


Canal Dover, Ohio. March 27, 1913.

Marietta Division main track in mid-distance, in front of large building at right; valley of Tuscarawas River.

New Comerstown, O., south of. March 30, 1913.

Marietta Division Bridge No. 27, over Tuscarawas River. North approach to bridge washed out. Ties of one track supported on steel cables, another cable placed for a hand rail, plank laid between rails, and the swinging track used for transferring passengers.



Marietta, Ohio. March 30, 1913.

Pennsylvania Lines Passenger Station in foreground, and Freight Station just back of it to the right. Water receding. High water line may be seen on roofs.

New Comerstown, Ohio, east of. April 7, 1913.

Temporary trestle replacing approach to Bridge No. 27, over Tuscarawas River.

On the 29th, when the Ohio River reached its highest at Marietta, the freight and passenger stations at that point were almost entirely submerged. Back water in Duck Creek valley covered the tracks as far as Whipple, and trains were not run into Marietta until the evening of April 2d.

It will be noticed that Duck Creek did no damage in the March flood. Less than four months later its valley was the center of a storm and flood, which in a restricted territory was a repetition of the March flood. On Sunday, July 13th, there was a heavy rainfall over the drainage basins of Duck Creek and Wills Creek. A thunderstorm accompanied by hail, wind and an unprecedented rainfall in the afternoon and evening made a record of from 6.5 to 7.4 inches of precipitation over the watershed between the two valleys and the headwaters of each creek, within eight or nine hours. Such enormous rainfall in so short a period is seldom experienced outside the tropics. At Marietta there was only 1.48 inches, and at Coshocton 3.15 inches, the belt of heaviest rainfall lying between these points.

On the morning of July 14th these creeks were many feet higher than they had ever been known to be before,—six to ten feet higher at most points on Duck Creek, and as the Marietta Division lies just at or above usual high water in this creek for the forty-three miles from Ava to Marietta, crossing and recrossing this stream twenty-two times, and its tributaries with almost as many more bridges, damage was done to almost the entire line between the points named. One bridge over the creek, No. 136, a through truss bridge two miles east (north) of Whipple was completely destroyed, and had to be replaced with a temporary pile trestle. A total of a mile and a half of track, at several points, was washed entirely off the roadbed. One passenger train was caught in the rising water near Stanleyville, and the passengers were rescued from its roof in flat boats. The water was nearly two feet over the tops of the coaches at the highest, and the train was saved from destruction by a drifting wooden bridge through the merest chance, it being deflected by a tree so that it only broke off the headlight of the locomotive.

The same storm did some damage on the Pittsburgh and Zanesville Divisions, and on the Walhonding Branch also, but not enough to be of serious consequence. The occurrence, however, well illustrates the point that a recurrence of the unusual conditions met in March threatens at any season of the year, although particularly to be expected in the spring.

WALHONDING BRANCH.

The Walhonding Branch, from Coshocton, Ohio, north to Loudonville, follows the valley of the Walhonding River from Coshocton to Walhonding, where the Mohican and Kokosing Rivers unite to form the Walhonding. It then follows the valley of the Mohican River up to Spellacy; and from there to Loudonville, the valleys of the Little Mohican and the Black Fork of the Mohican River. It is first on one side, then the other of these streams, crossing them thirteen times. These rivers all rise in the belt of greatest rainfall, and of the 45 miles of line, there were only about 17 miles where the track was not submerged. Most of the Branch was under from six to thirteen feet of water, with an exceedingly swift current, so that the destruction was almost complete. At every one of the thirteen bridges crossing the Walhonding and its tributaries, the bridge was destroyed or damaged or the approaches badly washed away, and long stretches of roadbed between were washed out. In all 12.11 miles of main track needed rebuilding or repairs, including two thirds of a mile of trestling.

Two work trains had been sent to Warsaw Junction when trouble first started, and these combined forces and were able to block up the track between Roscoe and Pomerene. But the conditions on all Divisions connecting with the Walhonding Branch were such that no adequate repair force could reach the points of damage until the other Divisions were sufficiently repaired. When this had been done, the Walhonding Branch work was attacked at five separate places at about the same time.

On Sunday, April 6th, the Pittsburgh Division having been sufficiently repaired to permit a Marietta Division work train to run from New Comerstown to Coshocton, work was started in replacing the fill east (south) of Bridge No. 1, and by the evening of the 7th, this was finished so that the gap between Bridges 1 and 2 could be reached, where 1,216 feet of trestle had been washed away. A track on the low level was constructed of guard rails of Bridge No. 1 and old ties, for use in distributing material where needed by the pile drivers.

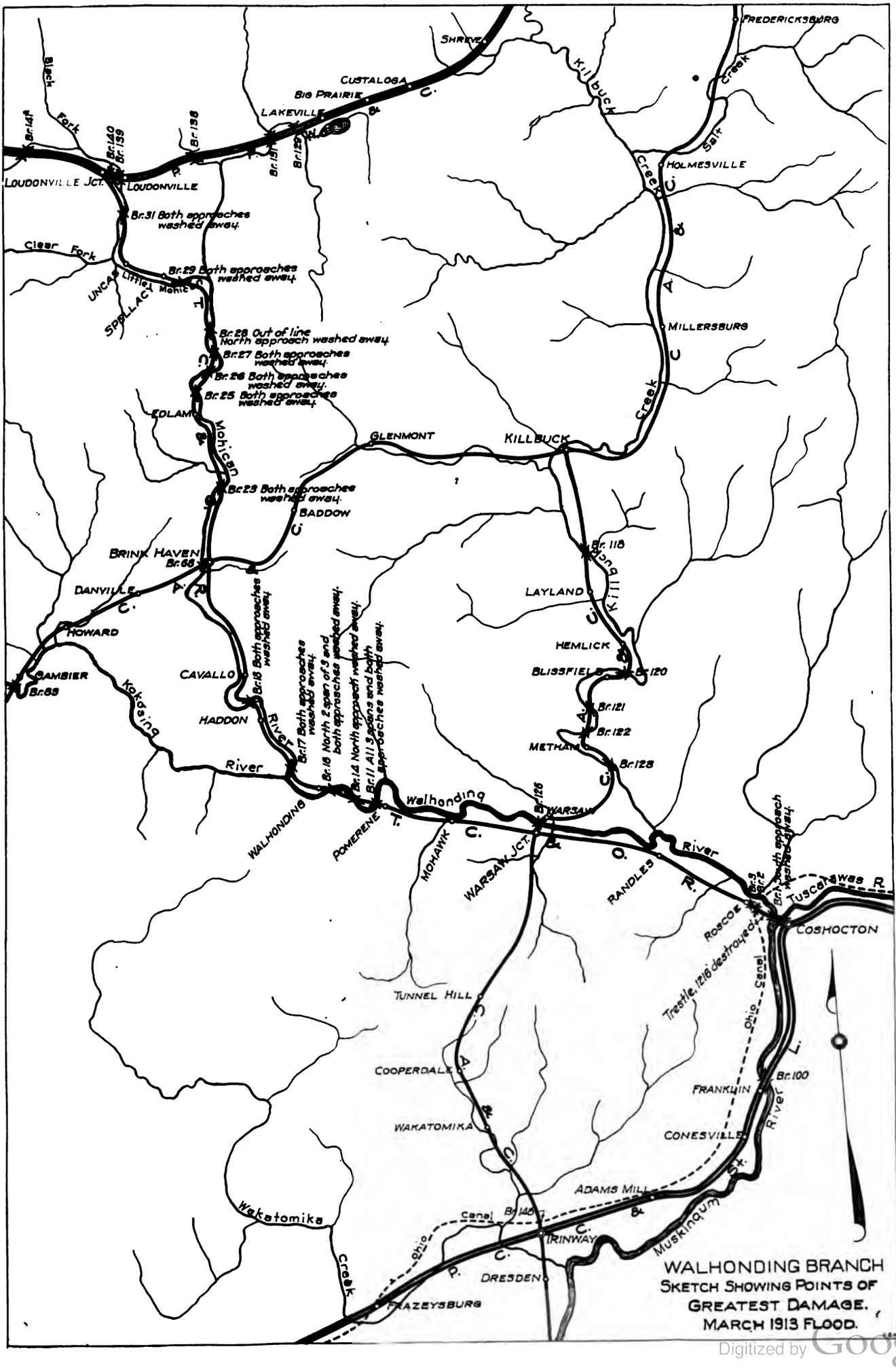
On the same Sunday, the 6th, a Toledo Division force, which had been engaged in repairing the Dresden Branch of the Akron Division, arrived at Warsaw Junction, and began to work north from there toward Brink Haven. On the same day, also, a Long Island Railroad force, which had been working on the main line of the Akron Division, arrived at Brink Haven, and began to work south toward Warsaw Junction.

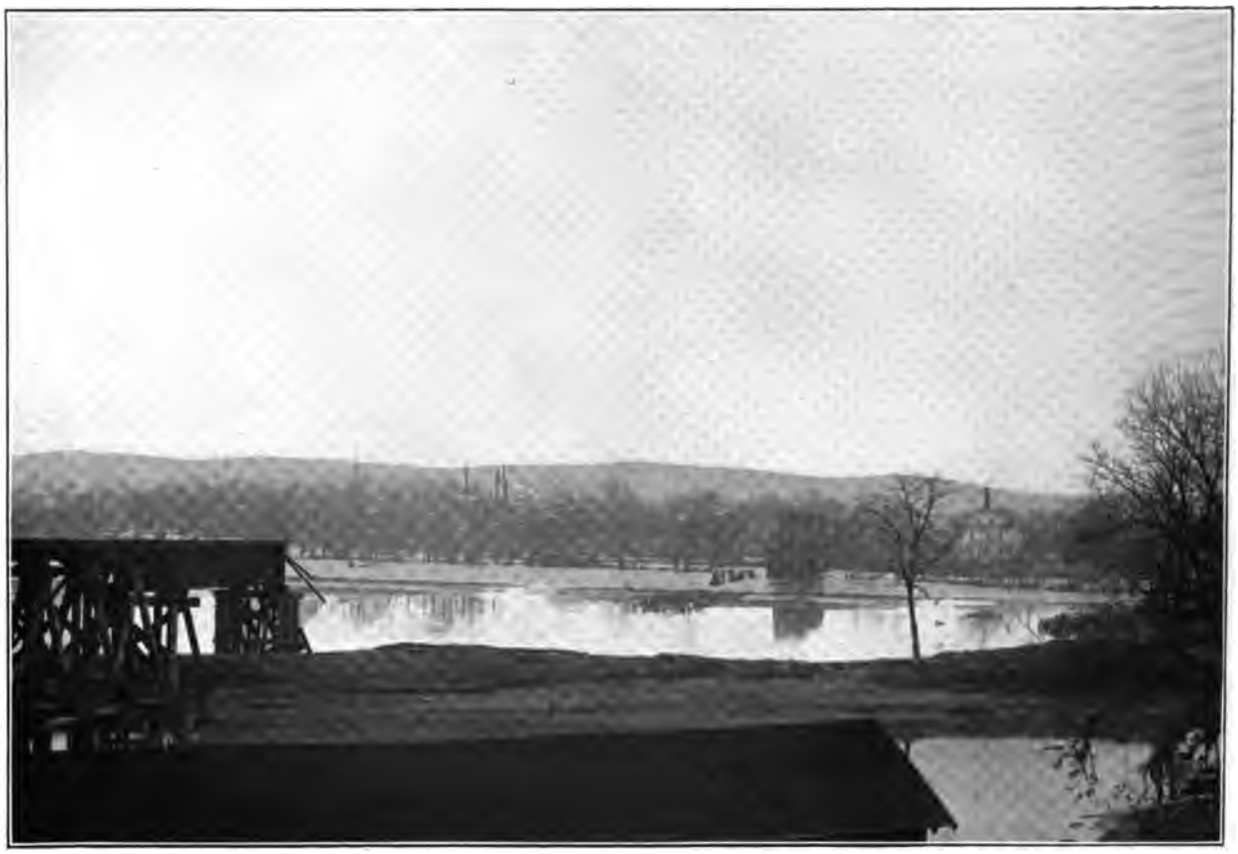
On April 9th a pile driver and crew arrived at Warsaw Junction, via Trinway, and went to the north end of the trestle gap between Bridges 1 and 2, so that trestling from both ends might cut in half the time necessary for getting through there. On the 9th, also, a force started at Loudonville to work south toward Brink Haven, and on the 10th, a force which had been putting the Akron Division main line in shape for schedule speed arrived at Brink Haven, to work north toward Loudonville.

Altogether, therefore, there were on April 10th six distinct forces engaged in the repair work on this Branch. As there was about 3,500 lineal feet of trestle to build, and nearly three miles of main track washed clear off the right of way, with something like six miles more to be cribbed and blocked up, the six gangs were none too many.

The trestling between Bridges 1 and 2 was completed on April 18th. The Toledo Division force completed Bridge 14 on the 19th, the Long Island force completed the work between Bridge 14 and Brink Haven on the 21st. On the 21st, the two forces working toward each other on the north end of the Branch met at a point east of Bridge 27, and the Branch was open throughout. On the 23d traffic on the Branch was resumed.

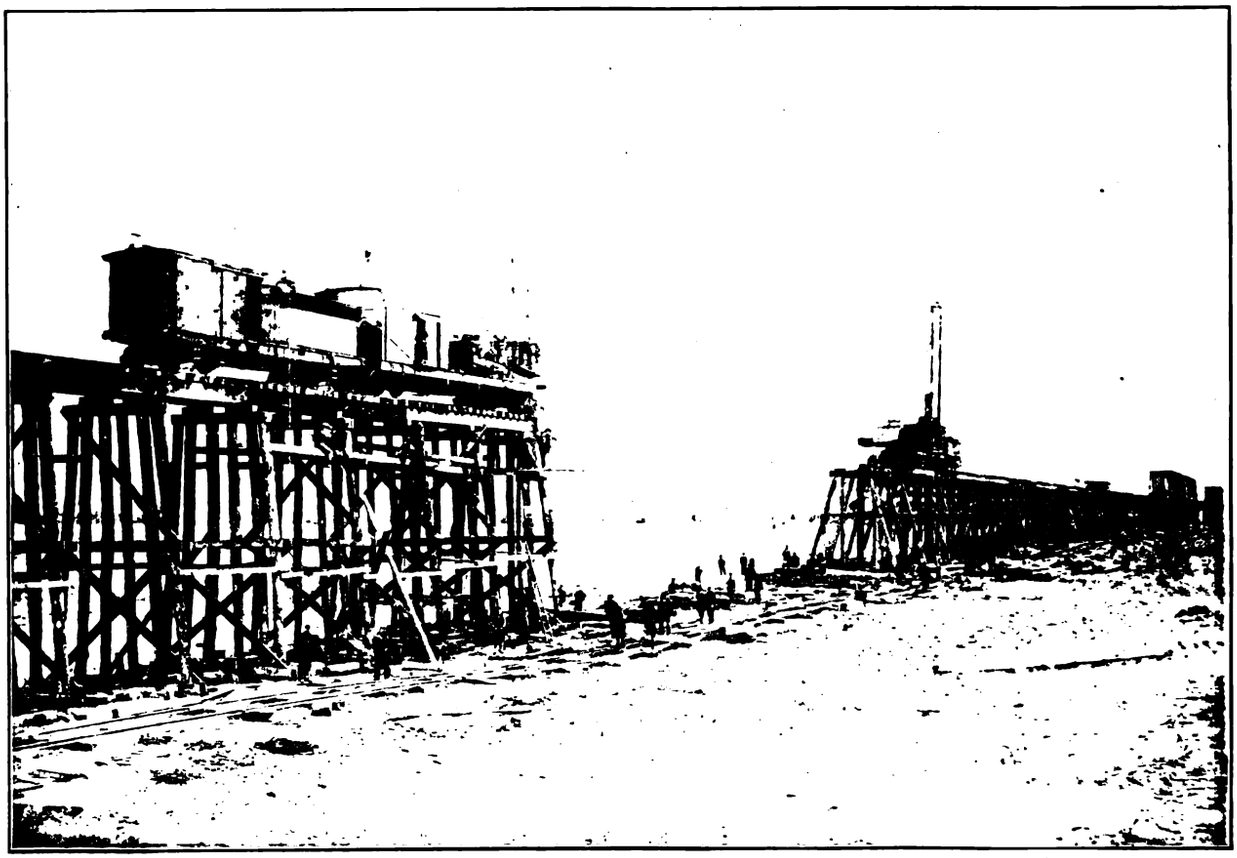
The location and extent of the principal breaks can better be understood from a sketch map of the Branch and the photographs of actual conditions (placed in order from Coshocton to Loudonville) than from a description. An idea of the enormity of the work may be gained from the statement that it required 6,900 cars of material to replace the lost fill and reballast the tracks.





Coshccton, Ohio, north of. April 5, 1913.

Between Bridges 1 and 2, 1216 feet of trestle washed away. This picture made before repair work was started.



Coshocton, Ohio, north of. April 16, 1913.

Rebuilding trestle between Bridges Nos. 1 and 2 on Walhonding Branch.

Pomerene, Ohio, west of. April 4, 1913.

Replacing fill washed out by Walhonding River.

Pomerene, Ohio. April 4, 1913.

Bridge No. 11, over Walhonding River, completely destroyed.

Walhonding, Ohio, east of. April 5, 1913.

View west, of washout west of Bridge 14, over Walhonding River, showing nothing but the larger stone left of the fill, and the overturned track in the field.

Walhonding, Ohio, east of. April 5, 1913.

Looking east toward Bridge 14, over Walhonding River.

Cavallo, Ohio, east of. April 5, 1913.

Looking west toward Bridge 18, over Mohican River.

Cavallo, Ohio, east of. April 5, 1913.

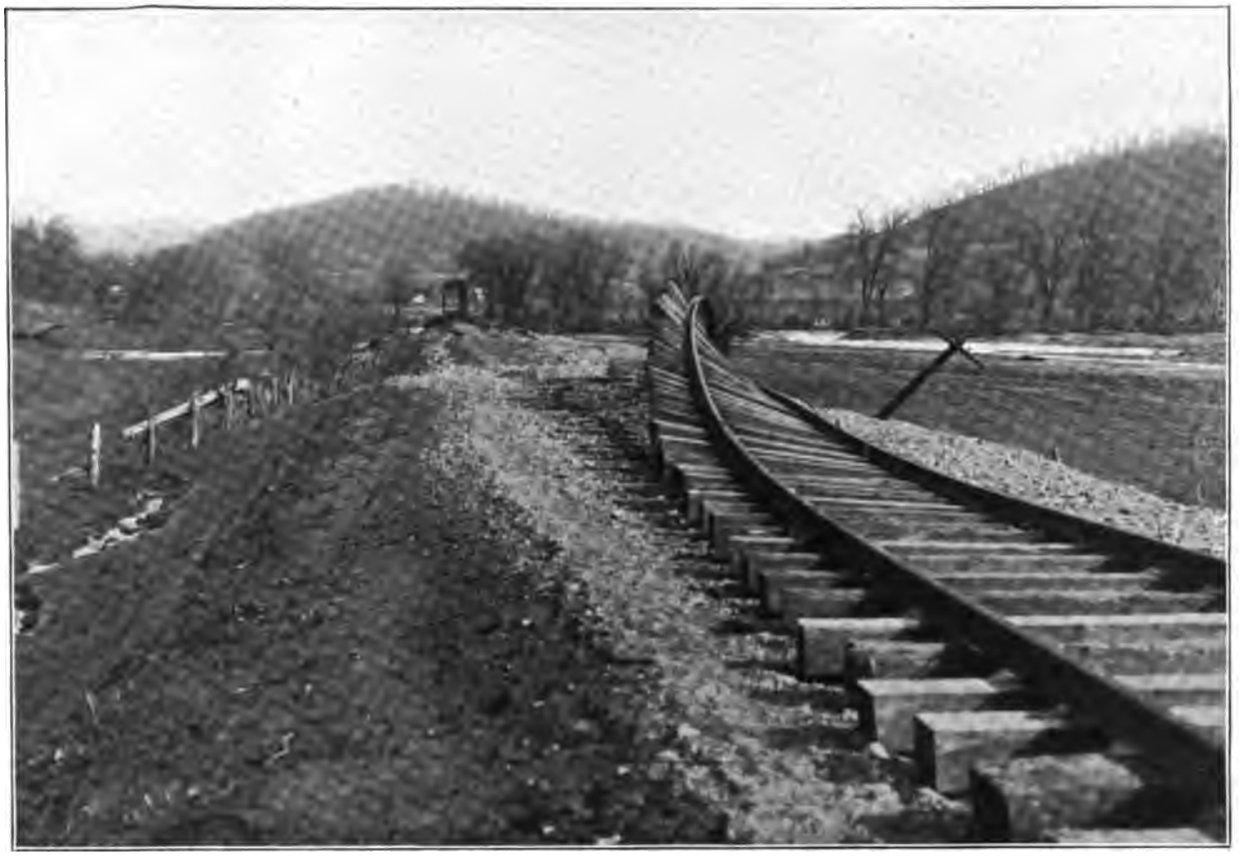
West approach to Bridge No. 18, over Mohican River.

Walhonding, Ohio, east of. April 5, 1913.

Bridge No. 16, over Walhonding River. Two spans carried away. A covered highway bridge stood on the masonry at the left, which was swept away and carried with it two spans of Bridge No. 16.

Edlam, Ohio, east of. April 6, 1913.

Looking west toward Bridge No. 23, over Mohican River.



Edlam, Ohio, west of. April 6, 1913

East approach to Bridge 25, over Mohican River.

Edlam, Ohio, west of. April 6, 1913.

East approach to Bridge No. 26, over Mohican River.

Edlam, Ohio, west of. April 6, 1913.

East approach to Bridge 27, over Mohican River.

Edlam, Ohio. April 18, 1913.

Derrick car turning over track which had been washed—rails downward—into the adjoining field, east of Bridge No. 27.

Edlam Ohio, west of. April 6, 1913.

View east, of washout at west end of Bridge No. 28, over Mohican River.

Spellacy, Ohio. April 12, 1913.

Bridge material for trestle at Bridge 28, being rafted down stream.
Bridge 29 in center of picture.

Spellacy, Ohio, east of. April 6, 1913.

East approach to Bridge 29, over Little Mohican River.

West Loudonville, Ohio. March 31, 1913.

View east on Walhonding Branch.

CHAPTER 27.

AKRON DIVISION.

The main line of the Akron Division, from Hudson, Ohio, to Columbus, lies for most of the distance in the belt of greatest rainfall. From Apple Creek to Mount Vernon, most of the line is in the valleys of the tributaries of the Walhonding River and was seriously damaged in a number of places. The Dresden Branch, from Killbuck to Trinway, was also seriously damaged, particularly where it follows Killbuck Creek, from Killbuck to Warsaw Junction.

Considering first the situation on the main line: By six o'clock on the morning of March 25th, traffic was brought to a standstill by water over the tracks at many points. Four passenger trains were marooned, one at Brink Haven, one at Orrville, one at Mount Vernon, and one at Apple Creek, neither of them being damaged, however.

At Bridge 18-A, south of Barberton, Wolf Creek washed out both main tracks for 900 feet and deposited a track of the Akron & Barberton Belt on the roadbed. At Bridge 18-AA, four miles south, Pole Cat Run washed out both tracks for about 1,100 feet. At Warwick, the track at Bridges 19 and 21, over Chippewa Creek, was under water six feet and 1,500 feet of track damaged. From Holmesville to Killbuck, for ten miles, the track was all submerged and 3.87 miles of it washed from one to six feet deep. At Brink Haven, the Mohican covered the part of the town in the valley and was eight feet over the tracks, washing out both approaches to Bridge No. 68. Near Howard, the Kokosing River (Owl Creek) washed out about 1,500 lineal feet of roadbed. Bridge No. 83 over the Kokosing River, south of Gambier, consisting of two through truss spans, was destroyed, with 105 feet of embankment, 20 feet deep. From this bridge to Mount Vernon, about five miles, nearly all the track was submerged, and over a mile of it altogether badly washed out. At Mount Vernon, about four hundred feet of roadbed was washed out five feet deep.

From Hudson to Akron the damage had been slight, and train service was resumed on the 26th. On that day the track was repaired to Barberton, and service extended there on the 27th. From Mount Vernon to Columbus, there was practically no damage, and service was also resumed on the 26th. One track was put in shape from Barberton to Warwick, and thence to Orrville the line was repaired by the 29th, and train service between Cleveland and Orrville was resumed. By the evening of March 31st, track was put in shape and service resumed to Millersburg. As the track from there to Brink Haven was soon made safe for work trains, this permitted starting work on trestling at the approaches to Bridge 68, over the Mohican River at that point. This was begun on the morning of April 1st, by a repair train sent by the Long Island Railroad. They first recovered and replaced the old deck of the north approach, and in the evening began the construction of trestle to replace the south approach. Thirty-two frame bents, five pile bents and 250 lineal feet of cribbing were constructed, and at 9:30 A. M. on the 3d, the train proceeded to Gambier, where the Kokosing River was to be spanned with a pile trestle.

Barberton, Ohio, west of. March 28, 1913.

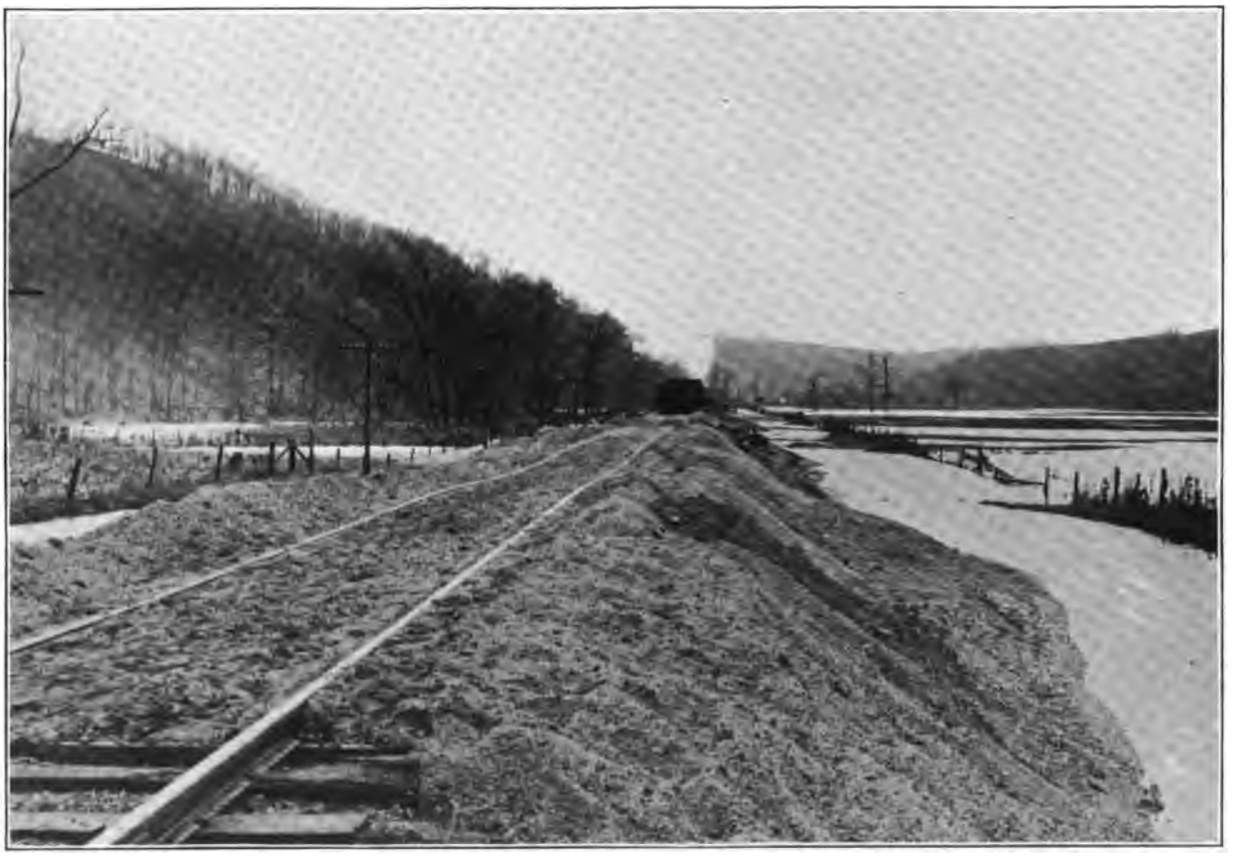
Situation at Bridge 18–A, showing track of Akron & Barberton Belt on Pennsylvania Lines right of way.

Millersburg, Ohio. April 2, 1913.

Repairing damaged track north of Millersburg.

Millersburg, Ohio, south of. April 2, 1913.

View of track replaced where it had been washed away south of Millersburg, looking north.



Killbuck, Ohio, north of. April 2, 1913.

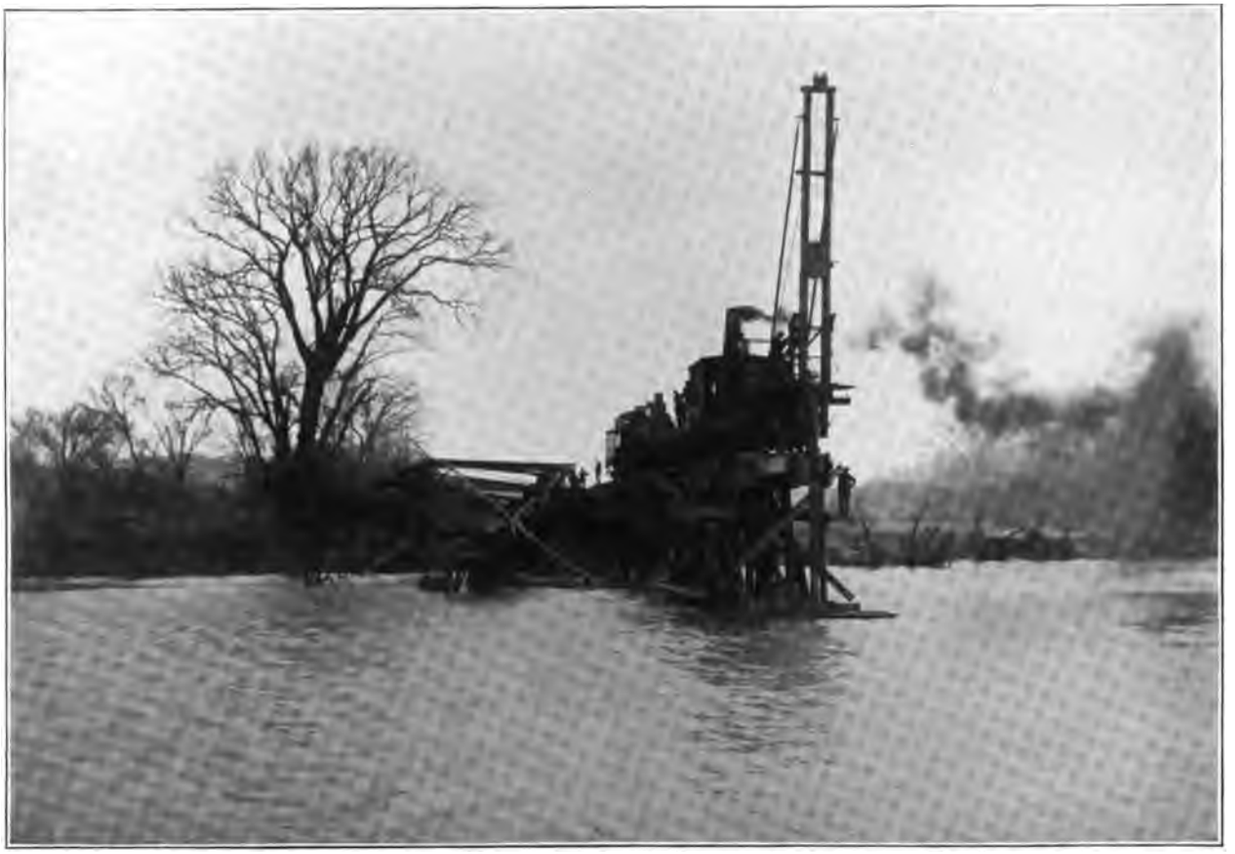
Showing new fill replacing that washed away north of Bridge 49, over Killbuck Creek.

Brink Haven, Ohio. April 3, 1913.

Building, evidently an old stable, lodged against Bridge No. 68, both approaches to which were washed away.

Brink Haven, Ohio. April 3, 1913.

South approach to Bridge 68, over Mohican River, replaced with temporary trestle and cribbing ready to fill. Walhonding Branch overhead bridge to be seen in distance.



Gambier, Ohio. April 3, 1913.

Bridge 83, over Kokosing River, being replaced with temporary trestle.

In the meantime, a force from the south end of the Division had repaired the track and bridges up to the Kokosing and had almost finished there. On the 4th, about noon, this trestle was finished, and the Akron Division main line was opened for traffic. This provided a detour route from Columbus, via Orrville to Pittsburgh, and Pan Handle passenger service was at once resumed via this route. There were so many slow orders, and the traffic was so heavy for the single track line, that commencing with Sunday night, April 6th, only the westbound Pan Handle trains were sent this way, the eastbound traffic being sent north from Columbus over the Sandusky Branch and the Toledo Division to a connection with the Fort Wayne road.

The two main repair forces were sent to the Marietta Division, Walhonding Branch, on the 5th, and the balance of the force was kept at work putting the line in shape for better speed until the 12th, when the work of repairing the Dresden Branch was begun.

On the Dresden Branch there was 4.81 miles of track requiring rebuilding or repairs, having been damaged by Killbuck Creek between Killbuck and Warsaw, by the Walhonding River at Warsaw Junction, and by flood water from the Muskingum River at Trinway. The point of greatest damage was at Bridge No. 126, over the Walhonding River, at Warsaw Junction, only one of the four spans of which was left standing, the track on the approach from the Junction being washed off the roadbed and turned upside down in the fields, one abutment destroyed and the three piers damaged. The location of the Branch will be apparent from the sketch map given in connection with the Walhonding Branch in the chapter next preceding, and this, with the photographs which follow, placed in order from Killbuck to Trinway, will give an idea of the conditions on the Dresden Branch.

After the main line had been put in good shape for traffic, the Division forces made the necessary repairs to the Dresden Branch. The pile trestle replacing Bridge 126, over the Walhonding River, was completed at 4:00 P. M. April 26th, and traffic was resumed on usual schedules.

Layland, Ohio, north of. April 8, 1913.

Approach to Bridge No. 118, over Killbuck Creek. Fences covered with hay, grass and debris typical of all valleys in State of Ohio.

Helmick, Ohio, south of. April 8, 1913.

South approach to Bridge 120, over Killbuck Creek.

Blissfield, Ohio, south of. April 8, 1913.

South approach to Bridge 121, over Killbuck Creek.

Metham, Ohio, north of. April 8, 1913.

Looking south, over north approach to Bridge No. 122, over Killbuck Creek; fill not badly damaged, but track swept to one side.

Metham, Ohio, south of. April 8, 1913.

North approach to Bridge No. 123, over Killbuck Creek; abutment undermined and approach badly washed.

Warsaw, Ohio, north of. April 8, 1913.

Looking south over washout, showing rails supported on cribbing in preparation for replacing fill.

Warsaw Junction, Ohio. April 4, 1913.

Dresden Branch Bridge No. 126, over Walhonding River.

Warsaw Junction, Ohio. April 4, 1913.

View north, of approach to Bridge 126, over Walhonding River.

Trinway, Ohio, north of. April 4, 1913.

Bridge No. 146, over Ohio Canal, and approaches washed away. Trestle over which fill was made exposed.

CHAPTER 28.

ZANESVILLE DIVISION.

Between Trinway and Zanesville, the Muskingum River was from fifteen to seventeen feet higher than it had ever been known to be before. Of the seventeen miles of track between these points, about fifteen were submerged to depths varying up to eighteen feet, and the two bridges over the river were destroyed. The city of Zanesville was inundated, the water coming into the second floor of the passenger and freight stations, where the Division offices are located.

The conditions which brought this unusual height of flood to Zanesville and vicinity are different from those through most of the flooded district. The Muskingum River, as far down as Dresden, occupies a wide valley, or flood plain, usually two miles or more in width. At Dresden it is joined by Wakatomika Creek, from a similarly wide flood plain, which apparently was, in prehistoric ages, the course taken by what is now the Muskingum, westwardly from Dresden to the valley of what is now the Scioto River. But at some later day, perhaps at a time of some great flood, the Muskingum found a cleft in the hills forming the southern wall of its valley, and a new course through the hills to the south into the Ohio River. This cleft and the new channel were doubtless, by succeeding floods, widened and deepened until they were finally permanently occupied, and the old channel gradually filled up with the products of erosion.

The present channel of the Muskingum is therefore narrow, and in many places bed rock is exposed by the stream. This happens at Zanesville, where, on account of the rock, it was impossible, in replacing Bridge 20, to resort to the pile trestle, usually so quick a solution of the problem of replacing the bridges destroyed. Instead, frame towers were constructed, and steel girders placed on them. At Ellis, however, there is a depth of about forty-five feet to the bed rock, and it was therefore possible to replace Bridge 12 at that point with a pile trestle.

Just below Zanesville the Divison leaves the valley of the Muskingum, following up the valley of Moxahala Creek to McLuney, crosses the summit and into the drainage basin of Hocking River, which it crosses at Lancaster. Crossing another summit, it descends into the valley of the Scioto and crosses the river a mile and a half west of Circleville. Another summit is crossed west of Reeseville, and the track descends into the valley of the Little Miami, along the valleys of Lytles Creek and Todd Fork.

At Lancaster, where the Hocking River valley is crossed, the yard tracks were washed out three or four feet deep. West of Circleville the Scioto covered the tracks for a mile and a half, destroying a ten foot fill for most of that distance, and the track which was on it. Numerous minor washouts occurred throughout the Division.

But the main points of damage were on the Muskingum River, at Ellis and Zanesville. At Ellis, Bridge 12 was completely destroyed, save for one span. This bridge was of deck truss construction, but a number of years ago, when slack water navigation was provided by a series of dams, a boat channel was dredged, and one of the deck

truss spans was raised and made a through span, to provide greater height for boats. This through span was left intact, but the other three spans were pushed into the river, destroying in their fall most of the pier structure on which they were supported. About 800 feet of approach fill from thirty to forty feet high was completely destroyed.

At Zanesville, by Wednesday morning, March 26th, the water covered the tracks. As it continued to rise, the stream took a short cut across the business portion of the town, until, when the water reached its highest, on Thursday morning, the 27th, there was eighteen feet of water above the track at Zanesville station, and in the whole "peninsula" on which the main part of the city is built, the water was well up in the second stories, with a very swift current. All small frame buildings in this section of town were destroyed or floated away bodily. Damage to property was heavy, but there was no loss of life, for the people had plenty of time to get to the higher ground. The water went down slowly, on account of the great quantity accumulated in the broad valleys above, and the tracks did not emerge from the water until Sunday March 30th.

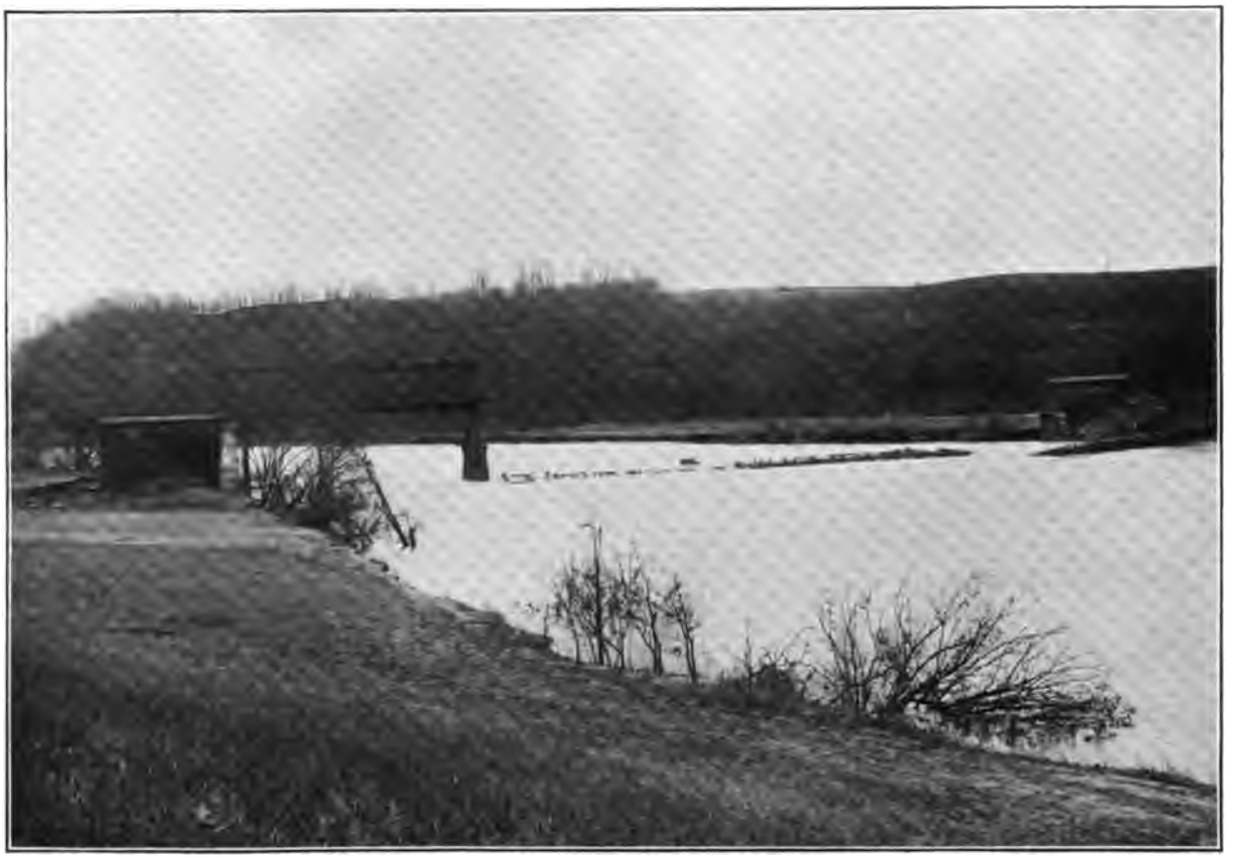
Bridge 20, over the Muskingum, had been swept off its piers, the steelwork destroyed, and the piers damaged. At the north end of it, Bridge 19, a 22 foot girder span over the canal towpath, and Bridge 18, a 110 foot girder draw span over the canal, were swept from their supports.

Train No. 49, which left Trinway for Zanesville Tuesday night, the 25th, was stopped by a landslide at Ellis. B. & O. train No. 8, which was being detoured, was just behind it. Both these trains returned to Dresden, on high ground, and were not heard from for several days, all wires being down. The B. & O. train was returned to that road via Trinway on Saturday the 29th, but the Zanesville Division train did not leave Dresden until Friday, April 4th, when it was taken to the north end of Zanesville, using the W. & L. E. from Ellis to Zanesville. On the night of the 25th, all the loaded cars in Zanesville yard for which room could be made at Putnam, were taken across the river to the high ground there, as was the baggage, etc., in the station. On the 26th and 27th not a train was operated on the Zanesville Division. On the 28th, one train was run back and forth between Darlington (four miles south of Zanesville) and Circleville. On the 29th, this service was extended to Putman, and as repairs were made, was gradually extended, until on April 3d the Division was open from Putnam to Morrow.

On the north end of the Division, the equipment of the train which had been marooned at Dresden was utilized, as soon as the Wheeling & Lake Erie road was opened from Ellis to the north end of Zanesville, in providing service between Trinway and Zanesville, commencing April 5th and continuing until Bridge 12 at Ellis had been replaced with a long pile trestle, on May 13th.

When the water went down at Zanesville enough to permit cleaning up and repairing the tracks and buildings, it was found that the only locomotive in Zanesville was a small passenger engine of the Zanesville & Western, which with its train had stood on a siding only a few hundred yards from Bridge 20. With this and a steam derrick borrowed from the B. & O. R. R., the derailed cars, drift and debris were picked up and hauled away. As there were no men or tools available for replacing Bridges 20 and 12, this work was turned over to contractors. Equipment and material could not be gotten to Bridge 20 until April 6th, when the B. & O. line was opened to Zanesville from Cambridge, and a temporary bridge of steel girders on timber towers was constructed and made ready for service on May 7th. At Bridge 12, work was commenced on April 15th, and the pile trestle was completed for service on May 12th, about a week having

been lost on account of one of the contractors' pile drivers overturning into the river on May 1st. On May 13th, regular schedules were again made effective on the Division, forty-eight days after they had to be abandoned.



Ellis, Ohio. April 2, 1913.

Bridge No. 12, over Muskingum River, showing span which had been raised and made a through span standing, while deck girder spans are in river.

Ellis, Ohio. May 1, 1913.

Bridge 12, over Muskingum River, being replaced with temporary trestle. Bent five damaged when driver turned over into river, a portion of which may be seen above the water, just in front of the damaged pier at the left of the picture.

Ellis, Ohio. May 14, 1913.

Temporary trestle, completed, replacing Bridge 12, over Muskingum River.

Zanesville, Ohio. March 30, 1913.

Looking north from second story of passenger station. Damaged shed at north end of freight station at extreme left of picture.

Zanesville, Ohio. March 30, 1913.

Looking north along Pennsylvania Lines tracks in Second Street from Main Street.

Zanesville, Ohio. March 30, 1913.

Looking south from Main Street toward former location of Bridge No. 20, over Muskingum River. The passenger train is a Zanesville & Western (tenant line) train which was marooned here during the flood, the high water line being visible about half way up on the coach windows.

Zanesville, Ohio. April 9, 1913.

Bridge No. 20, over Muskingum River, destroyed and masonry badly damaged. Bridges 18 and 19 are just beyond the farther bank of the river.

Zanesville, Ohio. May 7, 1913.

Temporary structure replacing Bridge No. 20, over Muskingum River.

Lancaster, Ohio. March 28, 1913.

Looking east from center of yard.

Circleville, Ohio. March 29, 1913.

About half mile east of Bridge No. 96, over Scioto River, showing track wrapped around tree and washed into fields.

Circleville, Ohio, south of. April 9, 1913.

North approach to Bridge No. 96, over Scioto River. "Remains" of track lying in field at left of roadbed.

CHAPTER 29.

VANDALIA RAILROAD.

ST. LOUIS DIVISION.

The St. Louis Division crosses the main water courses at right angles, and suffered severe damage at two points—at Indianapolis, where it crosses the valley of White River, and at Macksville, just west of Terre Haute, where it crosses the valley of the Wabash River.

The flood was ushered in a little more vigorously on the St. Louis Division than elsewhere on the Lines, for on Easter Sunday afternoon a tornado struck Terre Haute, doing extensive damage in the southern part of the city. It was so severe that had not Omaha's greater disaster occurred at almost the same hour, the country would have centered its attention on Terre Haute.

The heavy rains which followed brought the streams up to the danger point all along the Division, but only at Indianapolis and Macksville was serious damage done.

Between Terre Haute and Macksville the tracks lie comparatively low in the flood plain of the Wabash River. When the river overflowed its banks and spread out over the valley, it was dammed up by the Vandalia fill and the highways across the valley, until, on the evening of the 26th, it overflowed the tracks. The force which had been working at Vandalia to prevent damage from the Kaskaskia River was sent to assist the force at this point. In the morning it was found that the embankment had been completely washed away at two places, one gap being about one-half mile west of the bridge over the Wabash River (referrred to as the "east gap") and the other about three-quarters of a mile further west, at Macksville station (referred to as the "west gap"). Each of these breaks was about five hundred feet in length; one eleven eet and the other fifteen feet deep, on the average. Between them lies Macksville Yard, which was undermined at a number of points and considerably damaged.

The work of building pile trestle across the west gap commenced on the afternoon of the 28th, and across the east gap on the evening of the 29th. After the first twenty-four hours, when the work was slow on account of the very strong current, the work at the west gap progressed rapidly and one track was completed through at noon of April 1st. Men who had been ferried across to the section between the gaps had put a track in shape for service through this section, and the pile driver which had been working at the west gap was moved to the east gap to start work from the west end. The work from the east end had been hampered by a lack of material there, most of it having to be floated over from the west side of the west gap. As material was now gotten without difficulty, short work was made of the east gap, and it was closed at 3:00 o'clock in the afternoon of April 2nd.

In the meantime the damage at Indianapolis to the main track had been repaired and service over the main line of the Vandalia was resumed at 4:00 P. M. April 2nd.

Trains 30 and 24 of March 25th had been unable to get into Indianapolis on account of the washout at Belt Crossing. They were held in the transfer yard west of town

until the 28th, when the water went down enough to permit passengers to walk to the city. From the 26th to April 2nd only local and "make up" service was performed on such portions of the Division as were open. On the 3rd, this was extended over the whole Division; regular service was not resumed, however, until April 8th, on account of the lack of connections for the east. On the 8th all trains were put in service except Nos. 30 and 31, which were re-established on April 14th, with the opening of the Pittsburgh Division to traffic.

The bridge over the Wabash River at Terre Haute, No. 65, was not put out of commission at the time of the flood. Later it was discovered that the east pier had been undermined—17 feet in the deepest place—although the piles under the masonry supported it and the bridge without settlement. Arrangements were made to fill in around the piles under the pier with concrete, the foundation being sufficient; and to encase the entire pier in concrete, as the stone was disintegrating more or less.

Macksville, Ind. March 28, 1913.

Looking southeast from west side of west gap.
Wabash River, in finding additional channels, cut two gaps through Vandalia main line at Macksville.

Macksville, Ind. March 28, 1913.

Looking east from west side of the westerly gap in the St. Louis Division main line.

Macksville, Ind. March 31, 1913.

Looking southwest across west end of west gap in St. Louis Division main line.

Macksville, Ind. March 31, 1913.

Looking east over west gap in St. Louis Division main line.

Macksville, Ind. April 1, 1913.
Looking west across east gap in St. Louis Division main line.

Macksville, Ind. April 2, 1913.
Closing the east gap in the St. Louis Divison main line.

INDIANAPOLIS TERMINAL DIVISION.

In the vicinity of Indianapolis the White River did immense damage, particularly to railroad property. The first railroad bridge to go out was the old line Vincennes Division Bridge (now used for industrial purposes only) the west span of which was carried from its supports in the evening of the 25th. During the night the St. Louis Division old line bridge (now used for yard purposes only) was undermined and went down. North of this latter bridge stood the new bridge used to carry the main traffic of both Divisions, but this was not damaged by the flood.

The St. Louis Division main tracks were washed out for about half a mile west of the river, about three feet deep, and considerable damage was done in the vicinity of Belt Crossing.

The Vincennes Division old line was washed out for about a mile, two to three feet deep.

The Belt Railway was badly damaged in the western part of the city, four of its engines, standing on a track which was undermined, going into the water. All the other roads were put out of service at about the same time.

As the damage to main tracks was confined to washouts which could be repaired with ballast and filling material, these tracks were soon put in shape for traffic after the water went down, and by Saturday night, the 29th, passenger train service was started on the St. Louis Division to and from Indianapolis Union Station, running to Terre Haute, and on the Vincennes Division running to Campbells (26 miles).

Indianapolis, Ind. April 2, 1913.

Vincennes Division Bridge No. 1, over White River, on old main line.

Indianapolis, Ind. April 2, 1913.

St. Louis Division Bridge over White River at West Street yard, on old line.

Indianapolis, Ind., west of. April 2, 1913.

St. Louis Division; replacing track washed out just west of Belt Crossing.

VINCENNES DIVISION.

The Vincennes Division crosses the valley of White River at Indianapolis, and keeps to the west of the valley to a point north of Martinsville, where it again enters the valley of White River. From Martinsville south for nearly forty miles, it follows this valley and throughout this entire distance the track was under water for long stretches and was seriously damaged at many points.

At Bridge No. 3, where a wooden trestle had been replaced with a concrete box culvert, just north of Belt Crossing, the fill was so badly washed away as to require an eleven bent trestle.

Between Campbells and Bridge No. 34, about three miles of roadbed was washed out from two to four feet deep, and nearly two miles of track was washed completely off the roadbed, from fifty to a hundred feet, and about a mile of it turned upside down in the fields. At Martinsville, a mile and a half of track was washed off the right of way and the roadbed destroyed. The decks of all the small bridges were washed away through this whole district, and south of Rincon Junction there were numerous places where the roadbed was damaged. At Rincon Junction, a mile and a half of track was washed off the roadbed and the ballast all washed away.

The work of repair proceeded rapidly as there were only two or three points where trestling was necessary.

From the 25th to the 29th there was no train service on the Division. On the 30th, with the opening of the tracks at Belt Crossing on the St. Louis Division, trains were run from Indianapolis as far south as Campbells. On the next day trains were run between Vincennes and Worthington, also. On April 2nd, train service between Indianapolis and Vincennes was resumed, by using the St. Louis Division to Limedale, the Monon road to Gosport Junction and the Vincennes Division to Vincennes. Passenger service via this route was continued until April 4th, when the Vincennes Division was opened throughout, and on April 5th, regular passenger and freight service was resumed.

Indianapolis, Ind., south of. April 2, 1913.

Bridge 3, Vincennes Division just south of Belt Crossing. A concrete box culvert had been built replacing a wooden trestle partly filled in. Both were destroyed.

Martinsville, Ind., south of. April 3, 1913.

View west between Martinsville and Bridge 43, over White River.

MICHIGAN DIVISION.

In the evening of March 24th a freight train ran into a washout at Rosedale, where Raccoon Creek had washed the track. The Logansport wreck train, enroute to clear this wreck, early in the morning of the 25th, ran into another small washout near Crawfordsville, derailing the train and damaging the derrick car, so that both wrecks had to be cleared with a St. Louis Division outfit.

Outside of these occurrences there was no serious damage on the Michigan Division, except at Logansport, where the Wabash and Eel Rivers were very high.

At this point several hundred houses were inundated, and the water came up so quickly that the residents were caught in them. So few boats were available locally that an arrangement was made to bring large boats from Culver Military Academy at Maxinkuckee, with cadets to man them, by special train to Logansport for rescue work, on the 26th. When night came they were taken back to Culver for food and rest and brought down again the following morning to complete their work. Although early rumors were to the effect that many lives had been lost, it was later found that only one person had been drowned.

Eel River, in finding a new channel around a dam, considerably damaged Michigan Division tracks until the water was diverted by building a riprap and clay embankment across the new channel. Wabash River overflowed about fifteen hundred feet of track crossing that valley southwest of town and washed the ballast and embankment out from one to six feet deep under it, but did not damage the bridge across the river.

The Butler Branch was not out of service at any time, and regular train service over the entire Division was resumed on March 29th.

Logansport, Ind. March 27, 1913.
Washout at Tenth Street dam. Water washed out fill and embankment north of wing wall of dam, and Eel River made a new channel, taking away part of fill of Vandalia tracks.

CHAPTER 30.

GRAND RAPIDS & INDIANA RAILWAY.

On the G. R. & I. Ry. the trouble was centered in the district from Fort Wayne to Ridgeville, although there were minor washouts at numerous other points. The Wabash, St. Mary's and Salmonie Rivers and Big and Little Limberlost Creeks all threatened to destroy the bridges over them, but did not succeed, and the only bridge of any sort destroyed was a trestle near Decatur, in the St. Mary's River Valley, which was washed out, together with about 1,400 feet of track,

Passenger service was annulled on the 25th, between Richmond and Fort Wayne, and on the 26th between Ridgeville and Fort Wayne. On the 28th only the section from Decatur to Fort Wayne was out of service, and on the 29th, with the completion of repairs on the break at Decatur, full service was resumed.

CHAPTER 31.

TELEGRAPH DEPARTMENT.

As stated in the chapter on Meteorology, the main storm was preceded on March 21st by a violent wind storm, which did more universal damage to telegraph lines on the Lines West than had any previous storm. Poles were blown over, trees were blown across the wires, breaking them, car roofs from passing trains were blown off and cut the circuits at several points. In all there were on the Lines West, scattered from one end of the system to the other, fifty-five places where every wire was broken. Such wires as were not broken were crossed in many places, and intermittent crosses from swinging wires and swaying poles, with occasional branches of trees lodging in the wires, rendered the few that were left practically useless.

In the night, rain succeeded the wind, and in the western part of the territory this turned to sleet and heavily coated the wires, the weight even breaking the poles for a long stretch in Chicago. Lightning damaged the underground cable at Ft. Wayne, burning off many lines at the switchboard.

The situation is told more clearly in the diagrammatic map for the 21st than it can be described in words.

On Saturday, the 22d of March, repairs, at least sufficient to permit of their use, were made to the lines at practically all points. But it was found that permanent repairs would take weeks, for hundreds of poles were broken or listed, guy wires broken, and some stretches of line had to be completely replaced.

Before anything in the nature of permanent repair was even attempted, another gale struck the lines. The storm of Easter Sunday, the 23d, was almost if not quite as severe at Terre Haute as it was at Omaha, and the wind was high all through Indiana and Ohio. The damage done was mainly in Northern Indiana, where again car roofs were blown into the wires, an interlocking tower at Burnham was blown over, breaking the wires, and the tower at Davis was blown across the tracks, taking down a numbe of poles and breaking all the circuits.

On Monday the 24th the damage extended eastwardly; a car roof was blown into the wires at Converse, Ind., and another at Beloit, Ohio. The station at Beaver, Pa., was struck by lightning and the cable box burned out.

On Tuesday morning the 25th reports came in of flood damage everywhere. As the waters came up, communication facilities in every direction were cut off, until the lines were broken on eighteen of the twenty-two divisions, the four unaffected by the flood being the Peoria Division of the Vandalia, the Chicago Terminal Division of the Pennsylvania Lines, the Northern Division of the Grand Rapids & Indiana, and the Toledo, Peoria & Western Railway. Most of the day it was found possible to reach nearly all points

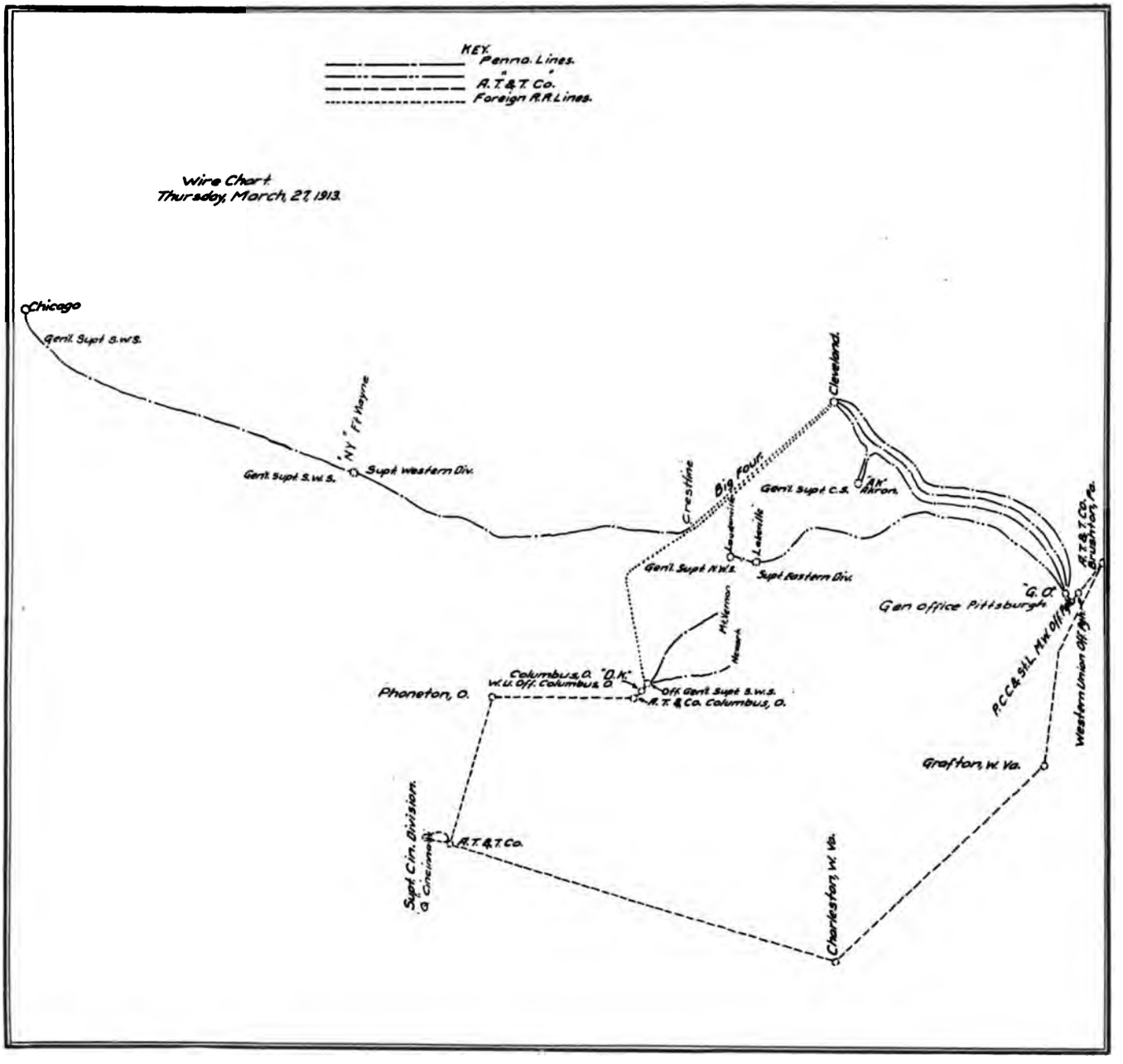
by roundabout routes, but some parts of the system were cut off from all communication, not only with headquarters but with the world, for the damage was suffered not alone by the railways, but by telegraph and telephone lines everywhere. Rumors, often vague and uncertain, were the only news from many points.

As the trouble was due to high water and the streams kept rising all day, no repair work could be attempted. Additional breaks occurred here and there throughout the day and night, until on the morning of the 26th communication was interrupted over most of the Pennsylvania Lines, except by long and uncertain detour lines. As routine business had been practically suspended, such wires as were available were given over almost entirely to flood bulletins and reports, and messages to and from the sufferers in the flooded districts.

At Piqua, the Miami River was so high and swift that it was impossible to get across the gap of about 150 feet east of Bridge 50 to replace the wires. A fishing line was procured and fastened to a small bolt, which was cast across the break. A heavier line was pulled across, followed by a messenger wire. This was securely fastened, and not only provided a means of stringing a telegraph line, but a cable buggy running back and forth provided the only means of communication between the two sides of the river for several days, being utilized by the militia, physicians, nurses and the public in general.

For the purpose of repairing the lines through Dayton, some baggage cars were loaded with twelve or fifteen boats at Yellow Springs, and with telegraph repair material and supplies. On arrival at Dayton, the boats and material were all confiscated by the relief authorities. Only a part of the material was ever returned, but it did good service in the public cause.

On Thursday, March 27th, it was found possible to repair a number of the broken circuits, and to piece out means of communication via such detour routes as could be found. The demoralization of service was so general that a devious detour route by which the management and those directing the work on each of the three operating Systems were brought in touch on one telegraph circuit, was felt to be a remarkable achievement. The method of its accomplishment is illustrated by the following diagram of the lines so coupled together.



During the day, by working in water and running a work train through the water for many miles, five circuits were restored on the Eastern Division through the flooded district, and Pittsburgh-Chicago service was resumed. A circuit to Columbus, Ohio, was provided over this line to a connection with the Big Four at Crestline; one to Toledo was provided via Bucyrus, and one to Logansport via Plymouth. A second wire over the break at Piqua gave fair service west over the Pan Handle and Vandalia as far as Macksville.

On the 28th the water was receding rapidly at most points, and, except for about a dozen places, where there were impassable barriers, one or more wires were put in shape for service over the entire road.

Along the Pittsburgh Division, by the use of a boat, a good many miles of line were cleared of debris and dead animals as the water went down enough to expose the wires, which had been completely submerged for long distances. The overturning of a pile driver on the Eastern Division broke all wires and interrupted service for about five hours. At Columbus, Ohio, a line was carried across the swift stream at the B. & O. S. W. crossing by an ingenious device, in which a board was attached to a cord by a bow in such position that it stood obliquely in the stream. The board was floated down stream, then pulled in part way, forcing it in the direction of the farther bank. This was repeated until it could be caught by a line thrown from the opposite bank, when the cord was pulled across, followed by a rope, and a messenger wire on which a cable was strung.

As the water went down, it was found that at many points offices could not be used on account of the destruction of the underground cable connections, and that hundreds of telephones at sidings had been washed entirely away.

On the 29th two wires were strung over the break between Columbus, Ind., and Seymour, restoring service over the whole of the Louisville Division. One line was restored from Morrow to Circleville on the Zanesville Division, giving service from Putnam (South Zanesville) to Morrow, and indirectly to Pittsburgh. Two wires were strung over the break in the Vandalia Lines at Macksville. After the capsizing of the boat used in the first attempt, another boat was secured and a messenger wire was placed over this break, on which a cable was strung, permitting the resumption of direct communication between Pittsburgh and St. Louis.

On Sunday, the 30th, a line was connected through on the Vincennes Division of the Vandalia, and the E. & A. Division wires were restored except from Youngstown to Niles. On the 31st all circuits from Bradford to Chicago were put in condition for use, and the rebuilding of the line through Delaware restored full service from Columbus north.

On Tuesday, April 1st, the only breaks remaining in the telegraph lines were as follows:

Pittsburgh Division, Trinway to Conesville.
Cincinnati " Morrow to Loveland.
" " Through Dayton.
Zanesville " Trinway to Zanesville.
New Cumberland, Walhonding and Dresden Branches.

The break between Trinway and Conesville was closed on April 3d at 4 A. M., but satisfactory circuits were not established until the 9th.

The line between Morrow and Loveland was opened with one wire on the evening of April 2d, and full service between Columbus and Cincinnati restored on the 5th.

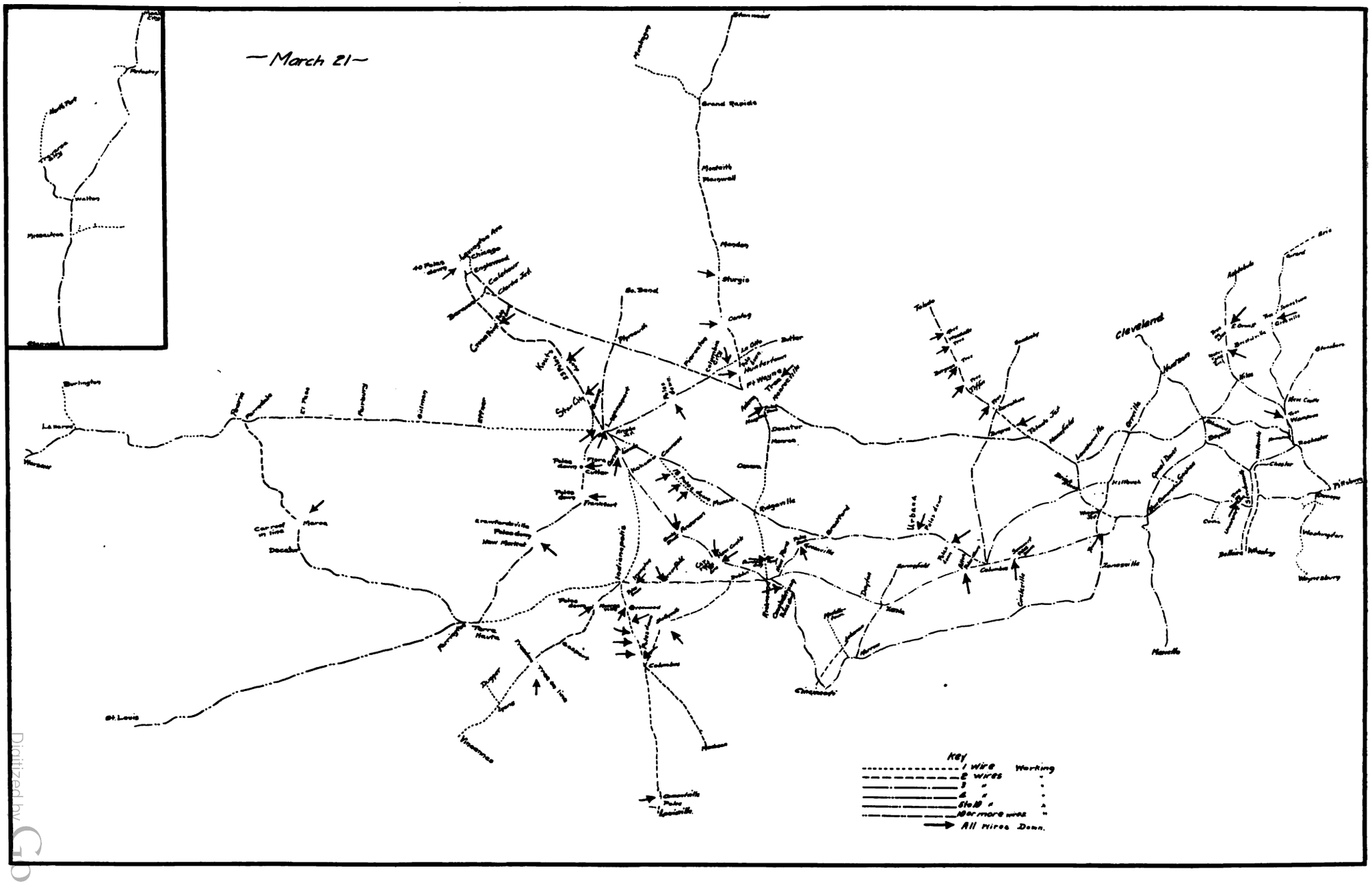
The first circuit through Dayton was secured on April 11th, and full service resumed the following day.

At Zanesville, circuits were run in from the south over the city "Y" bridge on April 3d, and from there north to Trinway a circuit was completed on April 6th.

The New Cumberland Branch service was restored on April 2d, the Dresden Branch on April 3d, and the Walhonding Branch on April 12th.

While it will be seen from the above that the last gap in the main line telegraph service was closed on April 11th, full normal service over all lines was not resumed until April 15th, on which date all wires had been restored, although some of them had not been permanently repaired.

For a clear understanding of the situation from day to day, the following series of diagrams showing the conditions of the telegraph lines, the number in service, and the location of the breaks, will be found superior to any description that could be given. It is impossible to show the hundreds of breaks due to the sleet storms of the 26th and 27th, but the points of damage by high water are all shown.

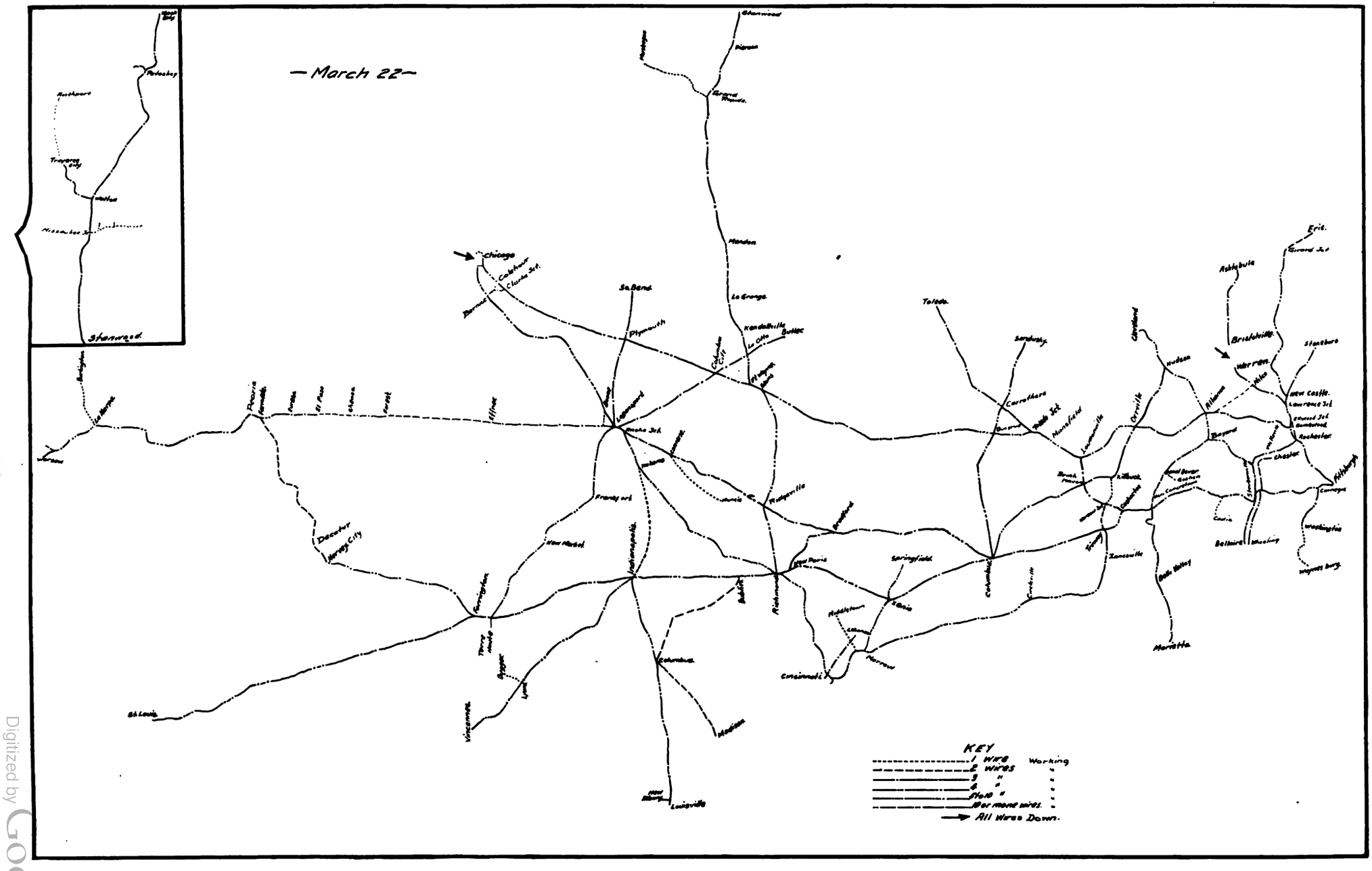


Flood of March 1913.

Pennsylvania Lines West of Pittsburgh.

DIAGRAM OF TELEGRAPH FACILITIES, MARCH 21, 1913.

The wind storm, which broke all wires at fifty-five places on this date, preceded the rain storm which brought on the flood.

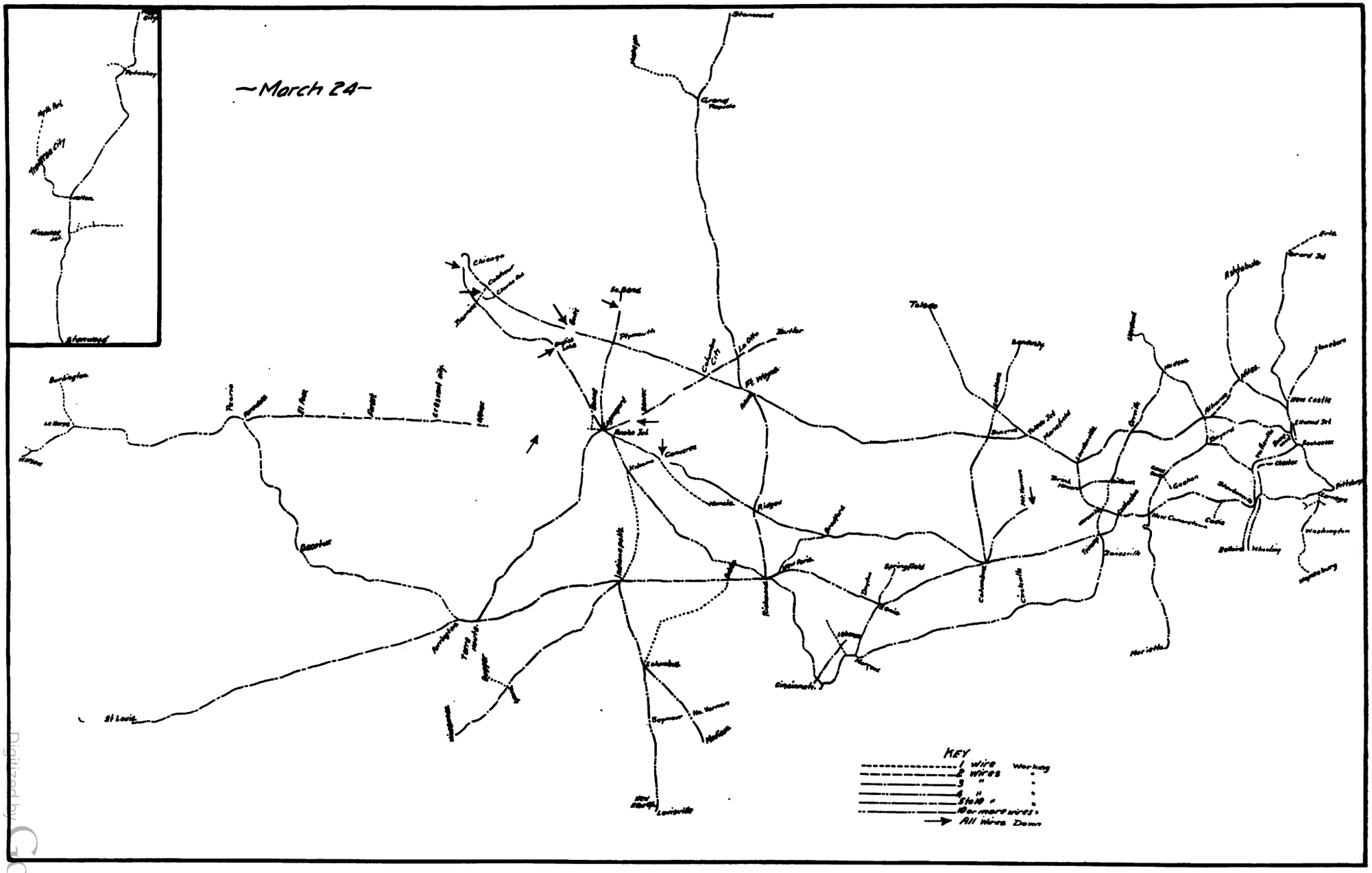


Flood of March, 1913.

Pennsylvania Lines West of Pittsburgh.

DIAGRAM OF TELEGRAPH FACILITIES, MARCH 22, 1913.

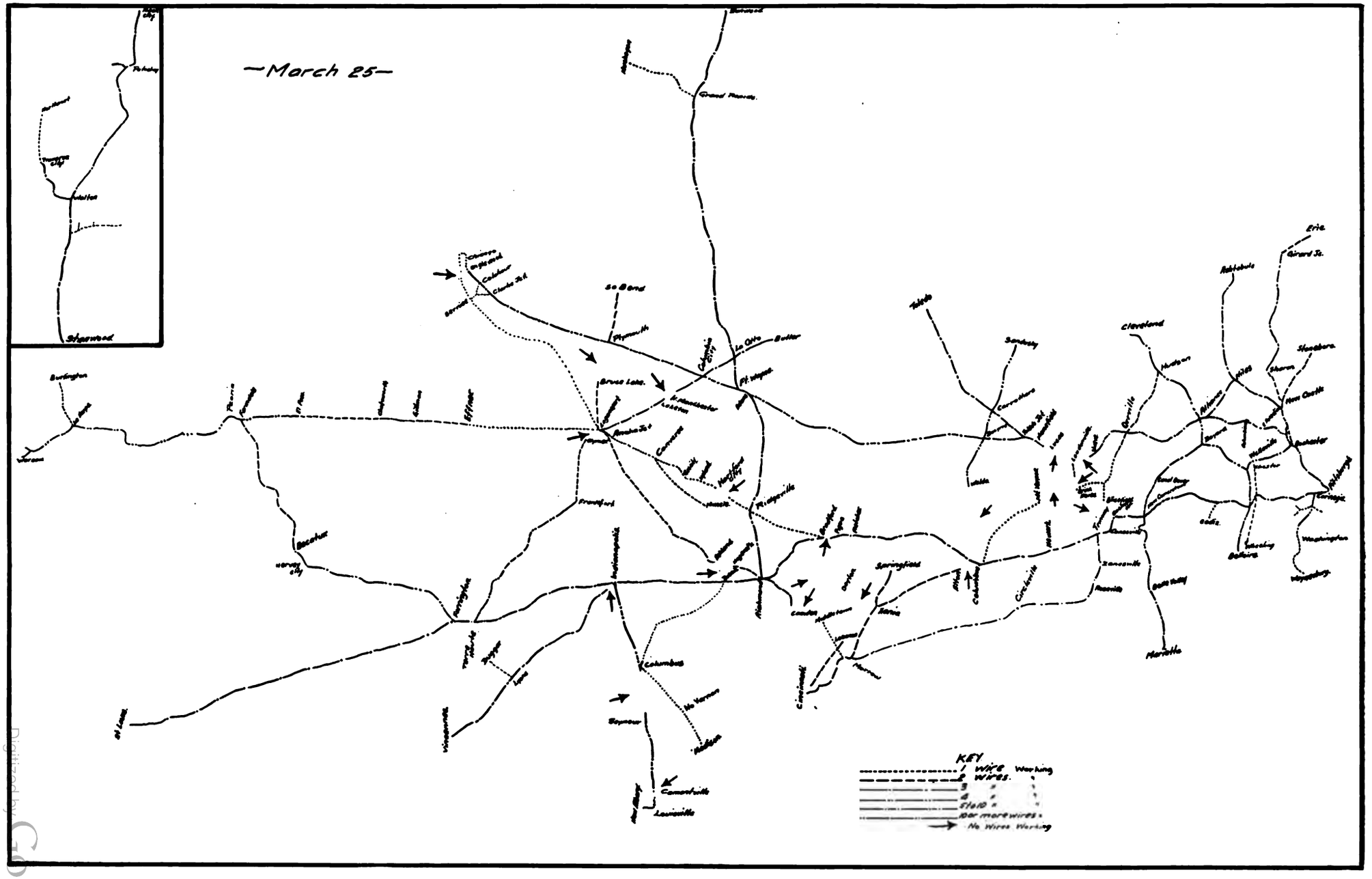
Following the wind storm of the 21st, practically all lines were restored to service before the main storm arrived and again disrupted service.



Flood of March, 1913. Pennsylvania Lines West of Pittsburgh.

DIAGRAM OF TELEGRAPH FACILITIES, MARCH 24, 1913.

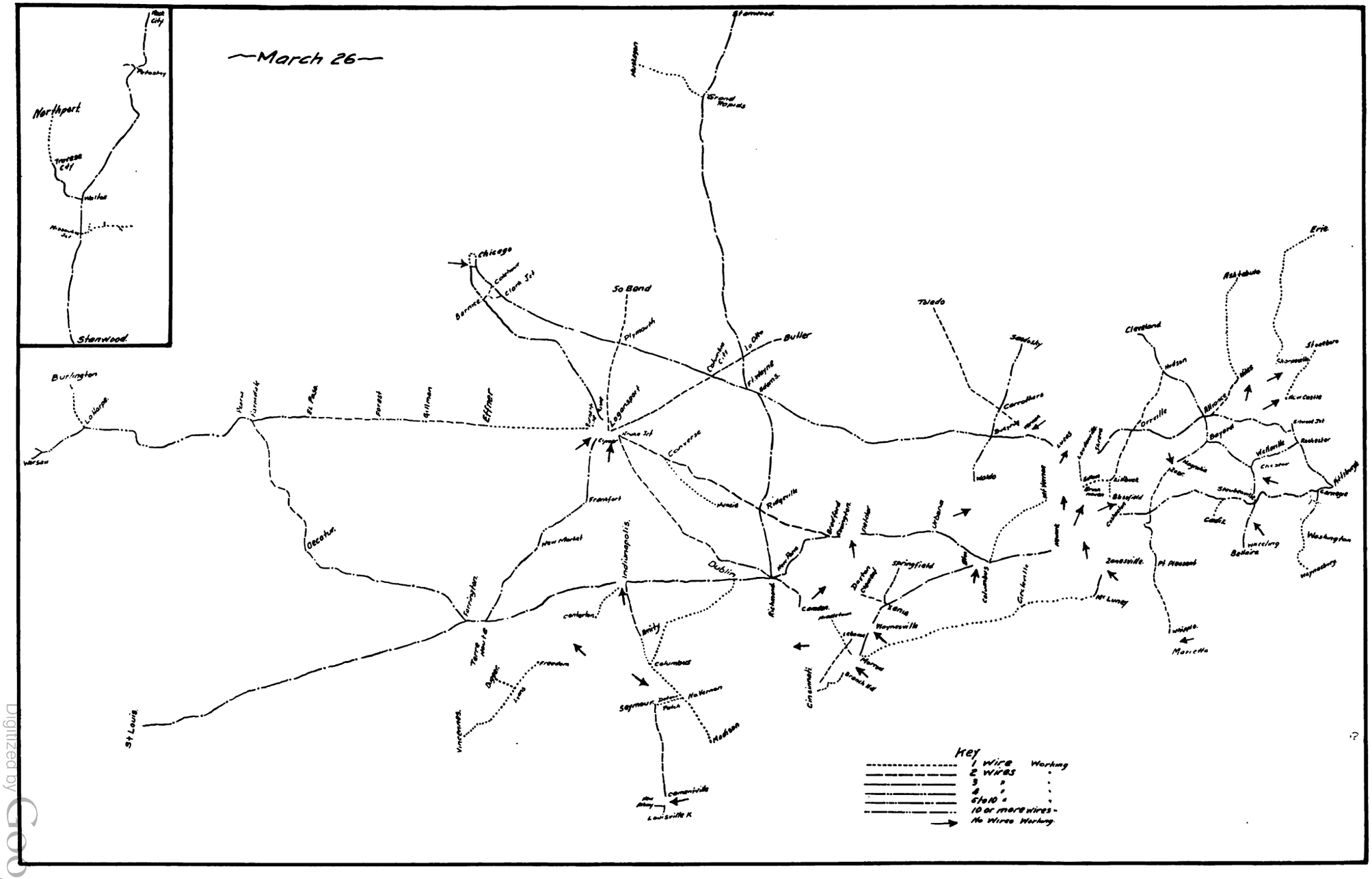
The damage on this date was due to the wind accompanying the storm of Easter Sunday, the 23rd, and was mainly confined to northern Indiana points.



Flood of March, 1913. Pennsylvania Lines West of Pittsburgh.

DIAGRAM OF TELEGRAPH FACILITIES, MARCH 25, 1913.

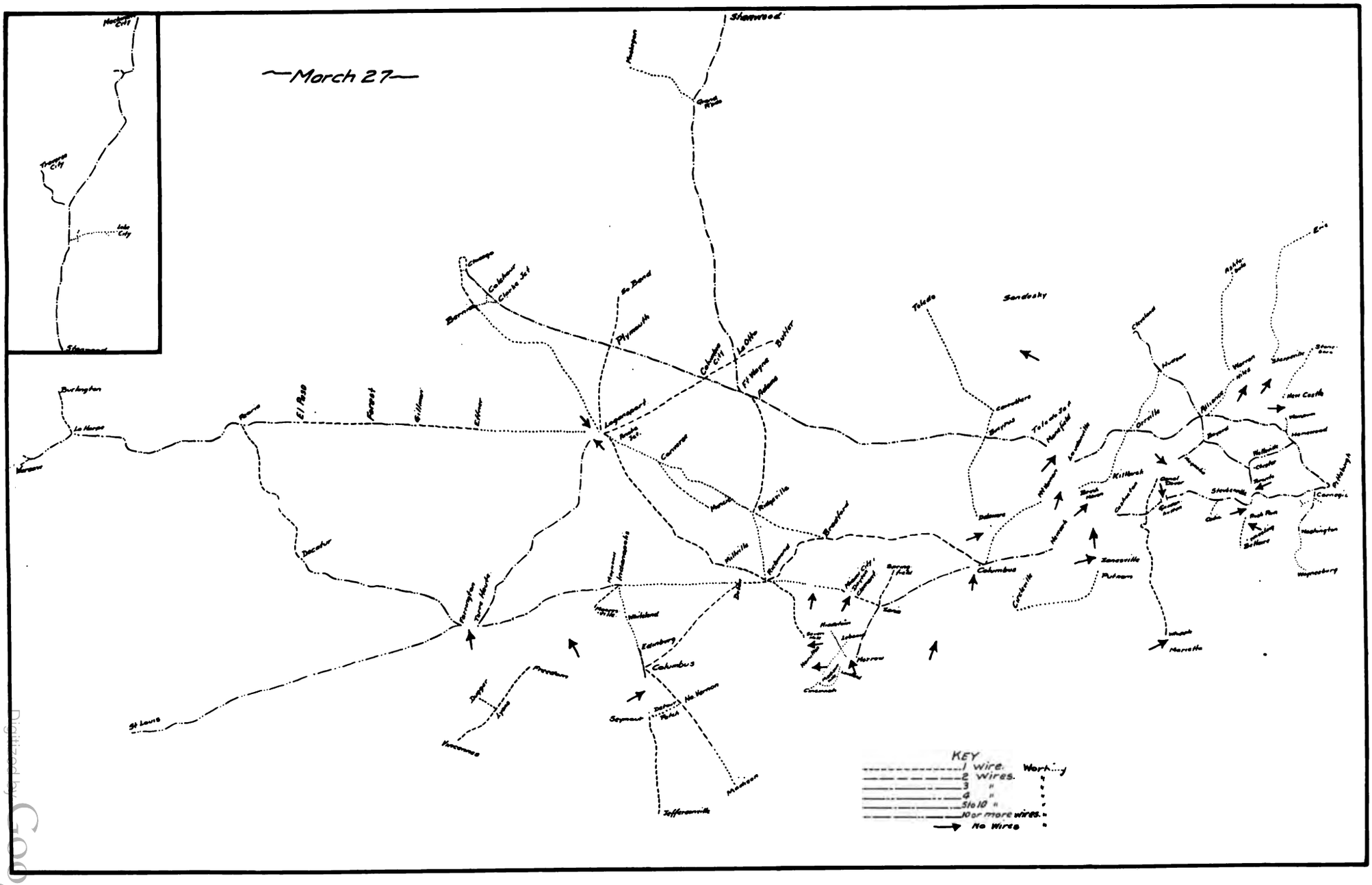
The damage on this and following days was from high water in the streams and was almost universal.



Flood of March, 1913.

Pennsylvania Lines West of Pittsburgh.

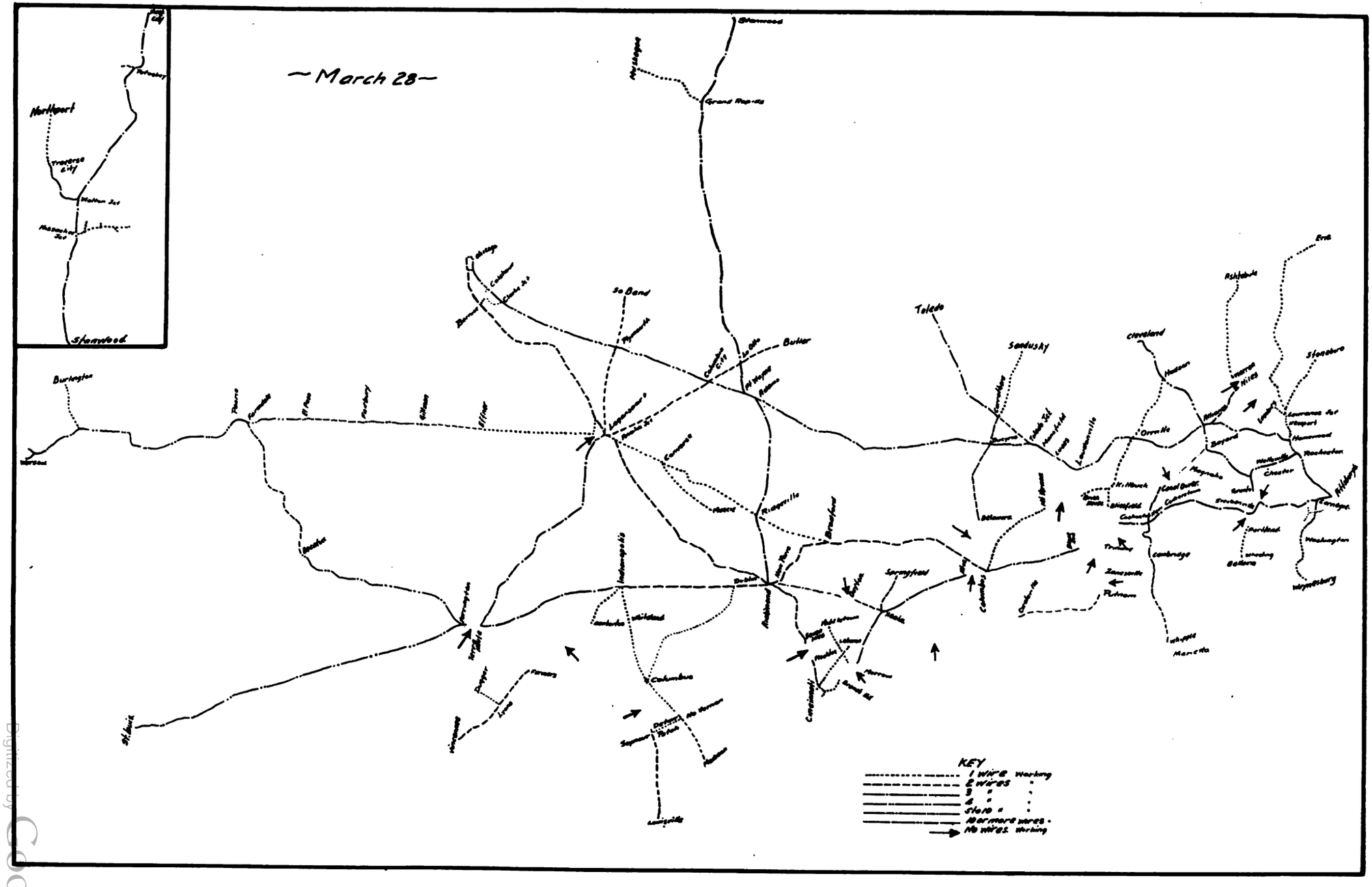
DIAGRAM OF TELEGRAPH FACILITIES, MARCH 26, 1913.



Flood of March, 1913.

Pennsylvania Lines West of Pittsburgh.

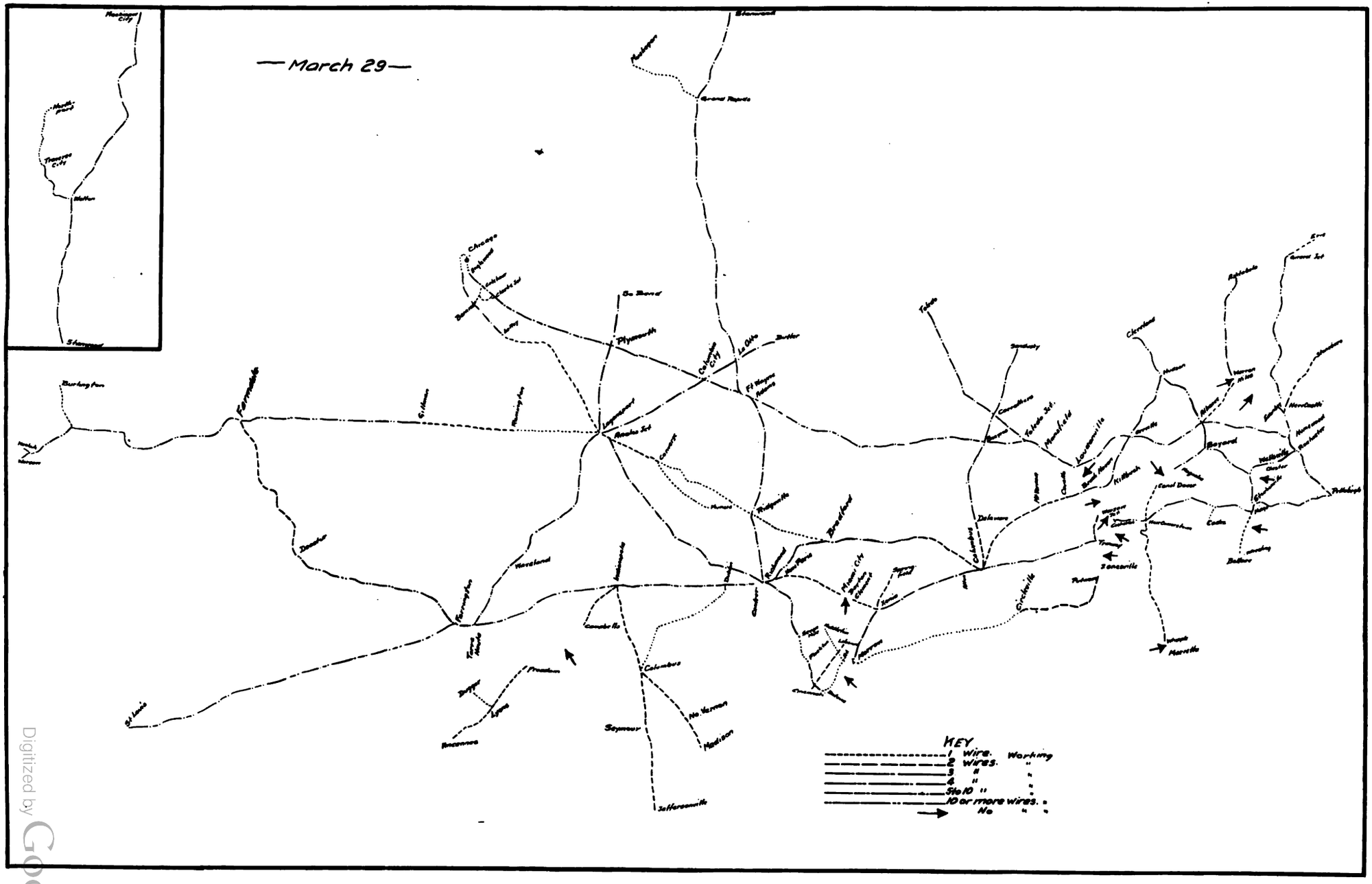
DIAGRAM OF TELEGRAPH FACILITIES, MARCH 27, 1913.



Flood of March, 1913.

Pennsylvania Lines West of Pittsburgh.

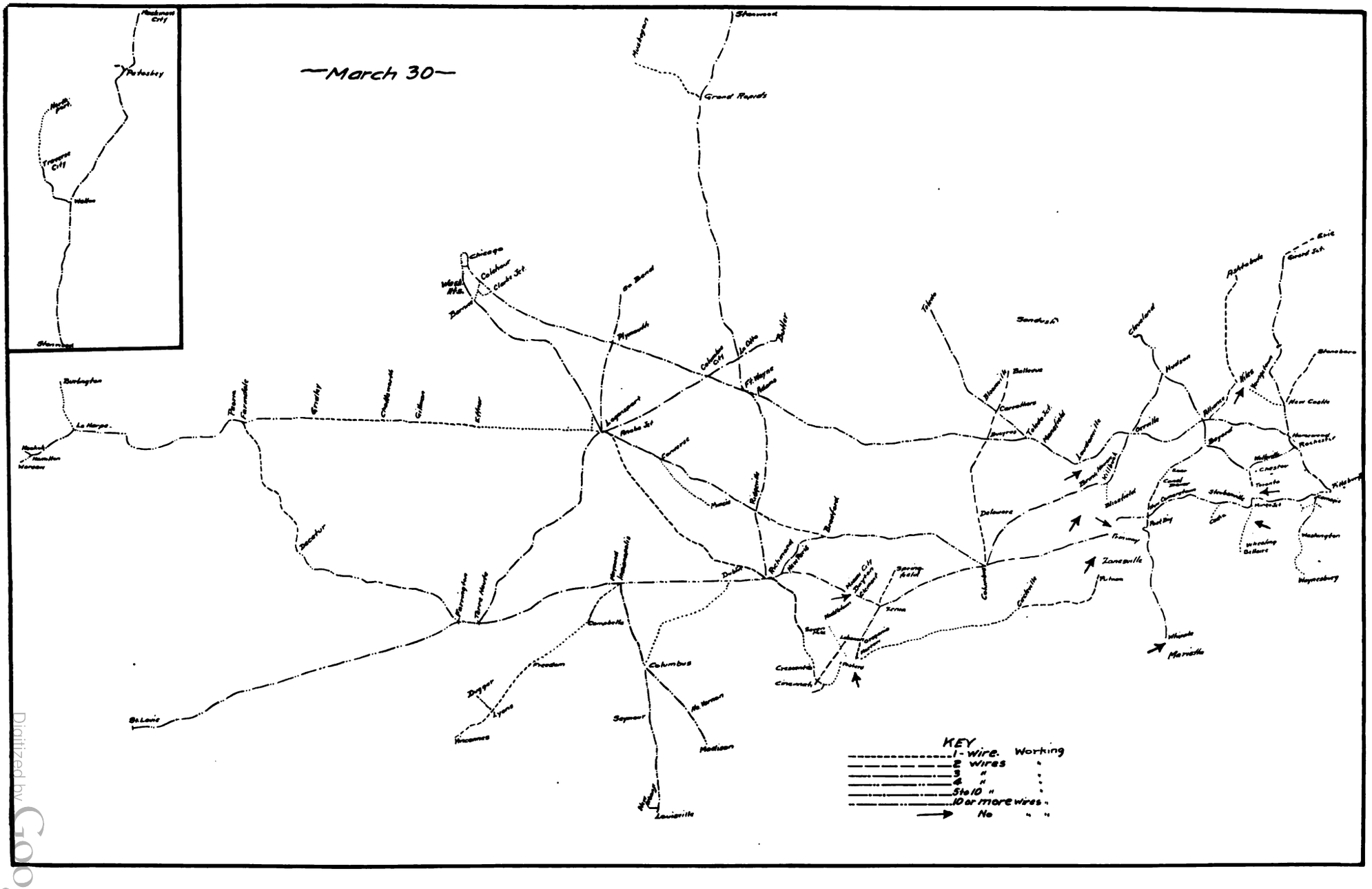
DIAGRAM OF TELEGRAPH FACILITIES, MARCH 28, 1913.



Flood of March, 1913.

Pennsylvania Lines West of Pittsburgh.

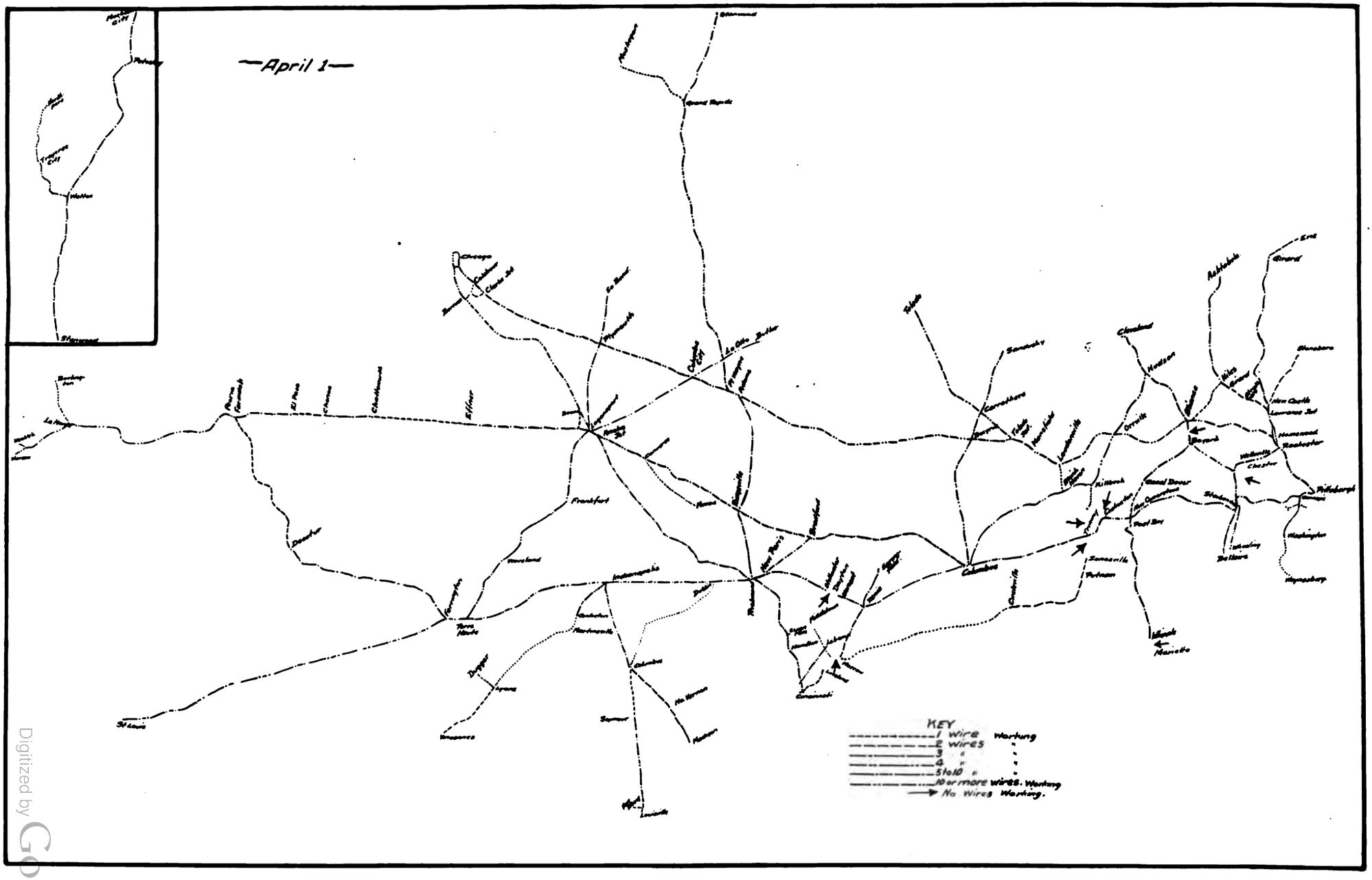
DIAGRAM OF TELEGRAPH FACILITIES, MARCH 29, 1913.



Flood of March, 1913.

Pennsylvania Lines West of Pittsburgh.

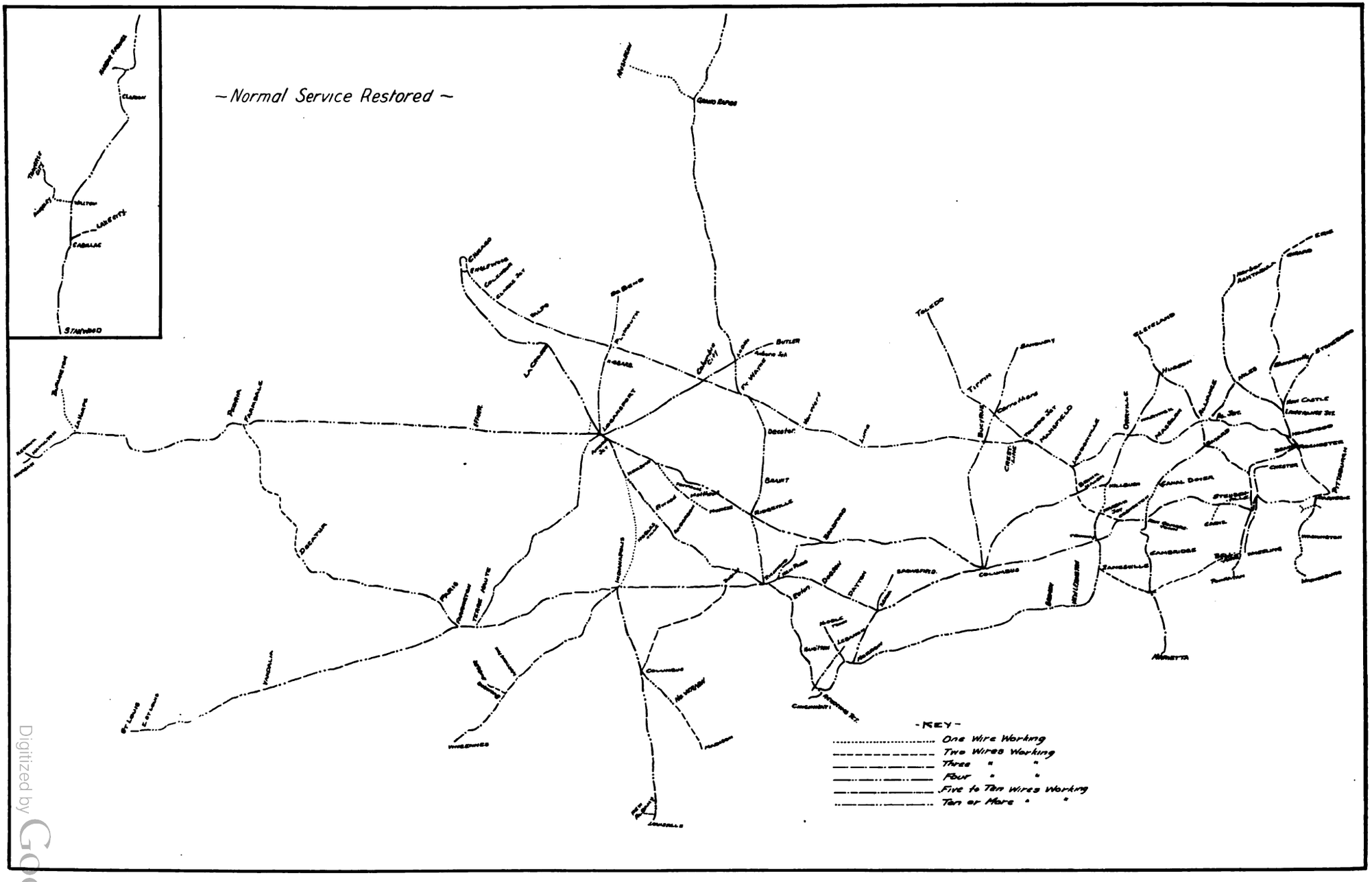
DIAGRAM OF TELEGRAPH FACILITIES, MARCH 30, 1913.



Flood of March, 1913.

Pennsylvania Lines West of Pittsburgh.

DIAGRAM OF TELEGRAPH FACILITIES, APRIL 1, 1913.



Flood of March, 1913. Pennsylvania Lines West of Pittsburgh.

DIAGRAM OF TELEGRAPH FACILITIES, APRIL 15, 1913.

With normal service restored at all points. By comparison with this map the difficulties encountered on previous dates from lack of communication facilities will be apparent.

APPENDIX

EXHIBIT A

RAINFALL BY DAYS

In Territory Traversed by Pennsylvania Lines West of Pittsburgh, during the period from March 23 to March 27, 1913.

These are the latest revised government figures, and do not always agree with those used in the preparation of the Rainfall Map, Chapter 1, but the difference is negligible for most purposes.

Observation Station	Watershed	March 23	24	25	26	27	Total (inches)
Pennsylvania, Western							
Aleppo ⊙	Ohio	.10	.08	.58	1.09	.97	2.82
Beaver Falls †	Ohio	....	.59	1.65	1.79	.92	4.95
Claysville ⊙	Ohio	.15	.17	.58	1.51	1.02	3.43
Confluence †	Youghiogheny	....	....	....	1.00	.76	1.76
Ellwood City †	Ohio	....	.69	1.81	1.61	.92	5.03
Erie *	Lake Erie	1.28	1.38	2.12	.91	.58	6.27
Franklin †	Allegheny	....	1.41	2.22	1.32	.88	5.83
Freeport †	Allegheny	....	.14	1.53	1.15	.35	3.17
Greensboro †	Monongahela	....	.06	.04	1.40	1.12	2.62
Greenville ⊙	Ohio	1.34	1.11	3.74	.95	.60	7.74
Indiana ⊙	Allegheny	.23	.62	.26	1.17	.80	3.08
Irwin ⊙	Monongahela	.24	.11	.27	1.23	.61	2.46
Mosgrove †	Allegheny	....	.19	1.77	1.93	.67	4.56
Pittsburgh *	Ohio	.20	.72	.55	1.66	.38	3.51
Saegerstown ⊙	Allegheny	1.00	1.09	3.70	.74	.98	7.51
Saltsburg †	Allegheny	....	.05	.20	1.50	.77	2.52
Sharon †	Ohio	....	1.19	2.92	1.24	.84	6.19
Warren †	Allegheny	....	.70	1.70	1.36	1.10	4.86
West Newton †	Youghiogheny	....	.10	.07	1.62	.64	2.43
Ohio							
Akron †	Lake Erie	....	1.85	4.75	1.89	1.16	9.65
Amesville	Ohio	.12	.03	.90	1.75	.91	3.71
Antwerp ⊙	Maumee	2.45	.85	2.50	.12	.55	6.47
Bangorville ⊙	Muskingum	.90	1.95	5.25	1.55	.91	10.56
Bellefontaine ⊙	Great Miami	1.37	1.52	5.61	2.13	.53	11.16
Benton Ridge ⊙	Maumee	2.36	2.00	2.64	.24	.30	7.54
Bladensburg	Muskingum	.51	1.21	2.63	1.87	.70	6.92
Bowling Green ⊙	Lake Erie	2.00	1.50	2.00	.30	.25	6.05
Brilliant	Ohio	+	+	+	+	+	2.58
Bucyrus	Sandusky	1.35	2.10	3.45	1.60	1.25	9.75
Cadiz	Ohio	.52	.92	1.22	1.60	1.41	5.67
Cambridge ⊙	Muskingum	.33	1.09	1.87	2.55	.88	6.72
Camp Denison	Ohio	.02	1.92	2.25	2.85	.40	7.44

* Midnight to midnight.
† 7 A. M. to 7 A. M.
⊙ 7 P. M. to 7. P. M.
\+ Included in following day, or total.
At stations not specially marked, time of reading gauge is irregular, readings usually being taken in the early evening.

EXHIBIT A—Continued.

Observation Station	Watershed	March 23	24	25	26	27	Total (inches)
Ohio—Continued							
Canal Dover..... ⊙	Muskingum.....	.62	.30	2.70	1.35	.75	5.72
Canton..... ⊙	Muskingum.....	1.03	2.20	3.00	1.62	.60	8.45
Cardington.....	Scioto.....	1.02	2.55	3.00	1.40	....	7.97
Chillicothe..... †	Scioto.....	....	.02	1.20	+	4.60	5.82
Cincinnati..... *	Ohio.....	....	2.21	4.15	1.11	....	7.47
Circleville..... ⊙	Scioto.....	.15	1.50	1.97	2.29	.37	6.28
Clarington.....	Ohio.....	.12	.10	.50	.95	.22	1.89
Cleveland..... *	Lake Erie.....	1.94	1.46	2.66	.91	.25	7.22
Columbus..... *	Scioto.....	.53	2.14	2.89	1.40	.01	6.97
Conneaut..... ⊙	Lake Erie.....	.90	1.23	2.86	.97	.85	6.81
Coshocton..... †	Muskingum.....	.09	.20	2.70	‡	‡	‡
Dayton (2)..... ⊙	Great Miami.....	.51	2.91	3.28	1.48	.76	8.94
Dayton (1).....	Great Miami.....	.48	2.95	2.27	+	1.90	7.60
Delaware.....	Scioto.....	1.12	2.00	2.46	1.87	T	7.45
Demos.....	Ohio.....	.23	.27	1.00	1.85	.72	4.07
Dennison.....	Muskingum.....	.42	.76	.90	‡	‡	‡
Frankfort..... ⊙	Scioto.....	T	1.20	1.67	2.20	1.42	6.49
Fremont..... ⊙	Sandusky.....	2.50	.72	2.80	.20	.94	7.16
Gallipolis..... †	Ohio.....	....	....	.14	1.80	1.22	3.16
Garrettsville..... ⊙	Mahoning.....	1.98	1.03	4.61	.88	.87	9.37
Granville..... ⊙	Muskingum.....	.49	1.43	2.68	2.06	.50	7.16
Gratiot.....	Muskingum.....	.39	1.29	2.21	3.00	.57	7.46
Green.....	Ohio.....	....	.03	.95	3.20	.46	4.64
Green Hill.....	Muskingum.....	.59	1.56	1.54	1.27	.66	5.62
Greenville..... ⊙	Great Miami.....	1.29	1.77	4.45	1.41	.41	9.33
Hamilton..... †	Great Miami.....	.32	.70	2.70	+	+	7.52
Haydenville.....	Ohio.....	....	....	1.40	.70	1.63	3.73
Hedges.....	Maumee.....	2.88	.91	2.45	....	.20	6.44
Hillhouse.....	Lake Erie.....	1.15	1.32	3.00	1.00	1.00	7.47
Hudson..... ⊙	Cuyahoga.....	1.60	1.90	4.10	1.15	.90	9.65
Ironton.....	Ohio.....	....	.01	.40	2.67	.81	3.89
Kenton.....	Scioto.....	2.00	1.50	3.60	1.20	.35	8.65
Killbuck.....	Muskingum	.70	1.65	3.75	2.00	.70	8.80
Kings Mills..... †	Little Miami.....	....	.69	2.57	4.06	1.22	8.54
Lancaster.....	Ohio.....	.38	2.48	1.74	2.48	.42	7.50
Lima.....	Maumee.....	2.20	1.34	3.35	.62	.40	7.91
McConnellsville.....	Muskingum.....	.21	.24	1.40	1.80	.68	4.33
Marietta.....	Ohio.....	.23	.06	.70	1.33	.35	2.67
Marion..... ⊙	Scioto.....	1.38	1.97	4.39	1.87	1.00	10.61
Medina.....	Lake Erie.....	2.09	1.46	3.30	1.28	1.05	9.18
Milfordton.....	Muskingum.....	.58	1.20	2.25	1.62	.60	6.25
Milligan.....	Muskingum.....	.34	1.35	1.78	2.04	.57	6.08
Millport..... ⊙	Ohio.....	.75	.90	1.90	1.35	.70	5.60

* Midnight to midnight.
† 7 A. M. to 7 A. M.
⊙ 7 P. M. to 7. P. M.
‡ Incomplete record, due to flood.
\+ Included in following day, or total.
T Trace only, not enough to measure.
At stations not specially marked, time of reading gauge is irregular, readings usually being taken in the early evening.

EXHIBIT A—Continued.

Observation Station	Watershed	March 23	24	25	26	27	Total (inches)
Ohio—Continued							
Montpelier	Maumee	1.85	.81	1.35	....	.60	4.61
Nellie	Muskingum	.75	1.50	2.60	2.50	....	7.35
New Berlin	Muskingum	1.10	1.20	3.30	1.30	.70	7.60
New Bremen	Maumee	2.06	1.80	3.22	1.22	.30	8.60
New Waterford	Ohio	.20	1.50	1.50	1.63	.72	5.55
North Royalton	Lake Erie	2.00	1.00	3.43	.35	1.23	8.01
Norwalk	Lake Erie	2.16	1.80	2.93	1.08	.70	8.67
Oberlin	Lake Erie	2.10	1.50	3.15	1.50	1.08	9.33
O. S. University	Scioto	.60	1.89	2.42	2.54	.41	7.84
Ottawa	Maumee	2.00	1.24	2.71	.35	.25	6.55
Pataskala	Muskingum	.50	1.66	2.37	2.12	.43	7.08
Peebles	Ohio	T	.16	.97	2.48	.37	3.98
Philo ⊙	Muskingum	.36	1.36	1.46	2.29	.70	6.17
Piqua †	Great Miami	....	1.80	‡	‡	‡	‡
Plattsburg	Great Miami	.50	1.75	2.01	2.10	.53	6.89
Portsmouth †	Ohio	....	T	.03	2.78	1.40	4.21
Sandusky	Lake Erie	2.20	1.58	2.05	.95	.40	7.18
Sidney	Great Miami	1.28	1.84	3.96	1.32	.38	8.78
Somerset	Muskingum	.29	1.10	1.60	2.50	.45	5.94
Springfield	Great Miami	.53	2.01	3.57	1.90	.67	8.68
Summerfield	Ohio	....	.22	1.20	2.07	.58	4.07
Syracuse	Ohio	....	.11	.49	1.61	.48	2.69
Thurman	Ohio	....	T	.58	1.65	T	2.23
Tiffin ⊙	Sandusky	1.98	1.12	3.65	.47	.75	7.97
Toboso	Muskingum	....	.78	2.50	3.07	.88	.....
Toledo *	Lake Erie	1.90	1.82	1.74	.48	.25	6.19
Urbana ⊙	Great Miami	.62	2.13	3.12	2.25	.54	8.66
Upper Sandusky †	Sandusky	....	2.00	2.15	3.50	1.19	8.84
Warren	Mahoning	1.70	1.80	2.92	1.36	.49	8.27
Waverly	Scioto	.01	.26	1.29	2.57	.38	4.51
Wauseon ⊙	Maumee	2.07	1.14	1.78	.32	.34	5.65
Waynesville	Little Miami	.35	2.15	2.56	2.30	.33	7.69
Wickliffe †	Lake Erie	1.53	1.14	2.71	1.06	.94	7.38
Wooster ⊙	Muskingum	1.16	1.94	4.84	1.40	.81	10.15
Youngstown †	Mahoning	....	1.02	2.96	‡	‡	‡
Zanesville †	Muskingum	....	.09	2.17	‡	‡	‡
Indiana							
Anderson ⊙	W. F. White	2.34	1.50	2.51	.50	.14	6.99
Attica †	Wabash	.37	2.80	2.28	....	.63	6.08
Auburn †	Maumee	.09	3.39	1.75	.13	.03	5.39
Berne ⊙	Maumee	2.30	2.34	2.56	.42	.19	7.81
Bloomington †	W. F. White	.11	.79	6.56	1.12	.62	9.20
Bluffton †	Wabash	....	3.80	3.00	.10	.60	7.50

* Midnight to midnight.
† 7 A. M. to 7 A. M.
⊙ 7 P. M. to 7 P. M.
‡ Incomplete record, due to flood.
T Trace only, not enough to measure.
At stations not specially marked, time of reading gauge is irregular, readings usually being taken in the early evening.

EXHIBIT A—Continued.

Observation Station	Watershed	March 23	24	25	26	27	Total (inches)
Indiana—Continued							
Butlerville..... ⊙	E. F. White.....	.14	2.57	4.43	1.56	.57	9.27
Cambridge City.... †	Whitewater.....	....	1.70	5.70	1.18	.80	9.38
Columbus..... †	E. F. White.....	.07	.72	7.00	1.60	.53	9.92
Connersville ..... ⊙	Whitewater.....	.68	1.85	5.67	1.46	.32	9.98
Crawfordsville..... ⊙	Wabash.....	2.80	2.30	2.20	.70	....	8.00
Delphi..... †	Wabash.....	.03	3.14	2.00	.03	.76	5.96
Elliston..... †	W. F. White.....	....	1.10	6.10	1.20	.20	8.60
Eminence..... ⊙	W. F. White.....	1.60	1.95	1.45	.25	....	5.25
Evansville..... *	Ohio.....	.29	.90	4.01	.30	.02	5.52
Farmersburg ..... ⊙	Wabash.....	.78	1.92	2.23	.21	T	5.14
Farmland..... †	W. F. White.....	....	2.97	4.42	.78	.77	8.94
Forest Reserve.....	Ohio.....	.01	2.10	3.30	2.30	.21	7.92
Fort Wayne..... *	Maumee.....	2.08	1.98	.69	.40	.21	5.36
French Lick..... †	E. F. White.....	T	.72	4.85	.79	.16	6.52
Greenfield..... ⊙	E. F. White.....	1.25	2.56	2.32	1.00	.15	7.28
Greensburg.....	E. F. White.....	.45	3.15	4.01	.84	T	8.45
Hammond.....	Lake Michigan...	1.80	.55	.21	.20	.23	2.99
Hickory Hill	W. F. White.....	.42	1.63	4.39	1.04	.05	7.53
Huntingburg..... ⊙	Wabash.....	2.27	4.50	.52	....	....	7.29
Huntington ..... ⊙	Wabash	1.80	1.05	1.95	.30	.30	5.40
Indianapolis..... *	W. F. White.....	1.27	2.76	1.56	.34	.08	6.01
Jeffersonville.....	Ohio.....	T	.17	4.24	1.33	.03	5.77
Judyville..... ⊙	Wabash.....	1.97	1.13	1.51	.27	.14	5.02
Kokomo..... ⊙	Wabash.....	2.18	1.57	1.97	....	.38	6.10
Knox.....	Kankakee.....	1.50	.91	1.45	.18	.10	4.14
La Fayette..... †	Wabash.....	2.02	1.22	1.35	.47	.15	5.21
La Porte.....	Kankakee.....	.55	.10	.60	.30	.10	1.65
Madison..... †	Ohio.....	.36	2.74	3.67	2.27	T	9.04
Marion..... †	Wabash.....	2.53	2.60	2.19	.40	.36	8.08
Mauzy..... ⊙	E. F. White.....	.56	2.25	5.59	.98	.27	9.65
Monticello ..... †	Wabash.....	....	2.92	1.94	.02	.70	5.58
Moores Hill..... ⊙	Ohio.....	.33	1.63	2.78	2.10	.08	6.92
Mt. Vernon ..... †	Ohio.....	....	.21	1.65	2.55	.37	4.78
Nashville.....	E. F. White.....	.37	2.02	6.01	.52	.05	8.97
Notre Dame	St. Joseph.....	1.18	.59	.50	.20	.04	2.51
Paoli.....	E. F. White.....	....	2.78	3.46	1.20	.08	7.52
Plymouth.....	Kankakee.....	1.43	1.08	1.31	.15	.25	4.22
Princeton..... ⊙	Wabash.....	.05	2.00	4.37	1.05	.06	7.53
Richmond.....	Whitewater.....	.88	5.30	4.17	.76	.04	11.15
Rochester.....	Wabash.....	1.85	1.05	1.56	.50	.20	5.16
Rockville.....	Wabash.....	1.85	2.87	1.64	.33	.33	7.02
Rome..... ⊙	Ohio.....	....	.10	3.13	2.46	.09	5.78
Salamonia..... ⊙	Wabash.....	3.55	1.16	3.04	1.08	.21	9.04

* Midnight to midnight.
† 7 A. M. to 7 A. M.
⊙ 7 P. M. to 7 P. M.
T Trace only, not enough to measure.
At stations not specially marked, time of reading gauge is irregular, readings usually being taken in the early evening.

EXHIBIT A—Concluded.

Observation Station	Watershed	March 23	24	25	26	27	Total (inches)
Indiana—Continued							
Salem ⊙	Ohio	.10	2.00	3.10	1.10	.20	6.50
Scottsburg	E. F. White	.20	2.69	3.41	1.31	.16	7.77
Seymour	E. F. White	.08	2.05	5.43	.28	.21	8.05
Shelbyville	E. F. White	.41	2.06	3.57	.90	.17	7.11
Shoals †	E. F. White	T	.37	6.66	1.80	.45	9.28
South Bend ⊙	St. Joseph	1.15	.53	.88	.60	.18	3.34
Terre Haute *	Wabash	1.05	2.45	.77	.19	.10	4.56
Underwood ⊙	Ohio	.01	2.10	3.30	2.30	.21	7.92
Veedersburg	Wabash	2.00	2.00	1.61	.47	.10	6.18
Vevay	Ohio	T	1.80	3.65	2.00	....	7.45
Vincennes †	Wabash	.20	1.10	6.20	1.30	.60	9.40
Washington	W. F. White	.15	2.08	5.83	.85	....	8.91
Whitestown †	W. F. White	.12	2.98	3.09	.11	.75	7.05
Whiting	Lake Michigan	1.00	.54	.17	.10	....	1.81
Winona Lake	Wabash	1.73	1.54	1.18	.31	....	4.76
Worthington	W. F. White	.21	2.26	4.25	.69	.18	7.59
Illinois, Eastern							
Albion ⊙	Wabash	T	2.10	6.23	.71	.07	9.11
Casey	Wabash	1.17	1.58	1.31	.55	.18	4.79
Charleston	Wabash	2.76	1.07	1.48	.54	....	5.85
Chicago *	Lake Michigan	1.16	.21	.13	T	....	1.50
Danville ⊙	Wabash	2.20	1.35	1.40	.54	.23	5.72
Equality ⊙	Ohio	T	.27	3.02	.97	T	4.26
Fairfeld	Wabash	....	2.22	6.13	.55	.65	9.55
Flora ⊙	Wabash	T	2.38	3.30	.40	.11	6.19
Golconda	Ohio	....	.26	5.31	.81	.41	6.79
Hoopeston	Wabash	2.10	1.32	1.27	.30	.20	5.19
McLeansboro	Ohio	....	1.60	4.35	.85	.16	6.96
Metropolis ⊙	Ohio	....	.35	3.74	1.25	.05	5.39
Montrose	Wabash	.69	2.03	1.21	.60	.10	4.63
Mt. Carmel †	Wabash	T	.86	6.20	1.50	.60	9.16
New Burnside	Ohio	T	.03	2.50	1.10	.08	3.71
Newton	Wabash	.42	2.06	1.82	.32	.03	4.65
Olney †	Wabash	....	.78	4.81	.75	.37	6.71
Palestine ⊙	Wabash	.16	1.34	3.67	.40	....	5.57
Paris †	Wabash	.25	2.34	2.45	.08	.32	5.44
Philo	Wabash	1.96	1.68	1.03	.24	.04	4.95
Rileyville	Ohio	....	.78	3.14	.79	.03	4.74
Shawneetown †	Ohio	....	.52	1.62	2.44	.74	5.32
Tuscola ⊙	Wabash	2.05	1.22	1.23	.42	.08	5.00
Urbana	Wabash	1.69	1.51	1.31	.28	.03	4.82

* Midnight to midnight.
† 7 A. M. to 7 A. M.
⊙ 7 P. M. to 7 P. M.
T Trace only, not enough to measure.
At stations not specially marked, time of reading gauge is irregular, readings usually being taken in the early evening.

EXHIBIT B

DAILY RIVER GAUGES

and Maximum Height of Streams in Territory Traversed by Pennsylvania Lines West of Pittsburgh, during the flood of March, 1913, as shown by records of U. S. Government.

OBSERVATION STATION	FLOOD STAGE (FEET)	MARCH 22	23	24	25	26	27	28	29	HIGHEST, 1913 STAGE (FEET)	HIGHEST, 1913 DATE	PREVIOUS RECORD STAGE (FEET)	PREVIOUS RECORD DATE	1913 Compared with previous highest stage (feet)
Mahoning River Youngstown, O.	5	.6	.5	4.7	15.5	22.9	.....	.....	10.4	22.9	Mar. 26	15.8	Jan. 21, 1904	+7.1
Beaver River Beaver Falls, Pa.	11	4.6	4.4	6.6	13.2	16.7	17.4	15.1	12.0	17.4	Mar. 27	15.4	Jan. 22, 1904	+2.0
Tuscarawas River Canal Dover, O.	8	.....	.....	2.3	7.0	13.0	15.0	16.1	9.0	16.1	Mar. 28	12.0	.....	+4.1
Muskingum River Coshocton, O.	8	1.0	1.2	2.5	11.0	.....	.....	.....	.....	*20.0	Mar. 25	22.0	Mar. 24, 1898	—2.0
Zanesville, O.	25	9.9	9.7	9.9	21.2	.....	*51.8	.....	.....	*51.8	Mar. 27	36.8	Mar. 24, 1898	+15.0
Beverly, O.	25	7.9	7.6	7.7	16.6	.....	*46.5	.....	.....	*46.5	Mar. 27	35.0	Mar. —, 1898	+11.5
Scioto River Columbus, O.	17	4.4	4.8	6.2	21.9	20.9	19.7	17.4	14.7	22.9	Mar. 25	21.3	Mar. 23, 1898	+1.6
Circleville, O.	12	.....	.....	.....	11.6	24.2	20.3	16.2	13.8	24.2	Mar. 26	19.3	July 17, 1884	+4.9
Chillicothe, O.	14	1.6	1.6	1.6	11.9	*37.8	.....	.....	24.6	*37.8	Mar. 26	28.3	Mar. 24, 1898	+9.5
Great Miami River Dayton, O.	18	3.0	3.0	7.0	24.0	†28.1	†22.2	†15.7	11.6	*29.0	Mar. 25	21.3	— 1866	+7.7
Hamilton, O.	12	3.0	3.0	4.8	19.6	.....	25.0	19.2	14.8	*34.6	Mar. 26	21.2	Mar. 24, 1898	+13.4
Little Miami River Kings Mills, O.	17	.....	.....	3.3	17.8	33.7	.....	.....	.....	33.7	Mar. 26	27.2	.....	+6.5
White River Anderson, Ind.	9	4.3	3.8	11.8	17.6	20.6	14.0	10.2	7.8	22.1	Mar. 25	18.8	Mar. 23, 1904	+3.3
Indianapolis, Ind.	12	4.7	.....	11.0	18.0	.....	.....	.....	.....	25.7	Mar. 25	19.5	Apr. 1, 1904	+6.2
Shoals, Ind.	20	7.4	8.0	8.8	21.6	29.5	37.0	42.2	41.7	42.2	Mar. 28	34.1	Mar. 30, 1904	+8.1
Wabash River Bluffton, Ind.	12	3.2	2.5	12.3	17.5	20.0	19.0	13.8	12.3	20.0	Mar. 26	16.7	Apr. —, 1904	+3.3
Logansport, Ind.	12	3.6	3.8	12.1	.....	22.5	.....	.....	.....	22.5	Mar. 26	17.3	Feb. —, 1883	+5.2
Terre Haute, Ind.	16	7.1	7.0	14.5	19.5	27.0	31.2	30.8	29.2	31.3	Mar. 27	27.7	Feb. 18, 1883	+3.6
Mt. Carmel, Ill.	15	11.9	13.4	13.6	18.3	21.4	23.0	24.8	27.8	31.0	Mar. 30	28.3	Aug. 7, 1885	+2.7
Ohio River Pittsburgh, Pa.	22	5.3	4.8	4.5	7.8	20.1	28.1	30.4	24.8	30.4	Mar. 28	35.5	Mar. 15, 1907	—5.1
Wheeling, W. Va.	36	8.8	8.3	7.5	11.5	30.5	45.5	50.8	50.0	51.1	Mar. 28	53.1	Feb. 7, 1884	—2.0
Parkersburg, W, Va.	36	10.5	10.0	9.5	10.0	22.1	43.0	54.9	58.7	58.9	Mar. 29	53.9	Feb. 9, 1884	+5.0
Cincinnati, O.	50	27.5	24.7	22.6	29.3	50.3	57.2	62.6	66.0	69.8	April 1	71.1	Feb. 14, 1884	—1.3
Madison, Ind.	46	25.1	23.6	21.6	27.5	43.5	53.6	57.0	59.6	62.8	April 1	61.8	Feb. 15, 1884	+1.0
Louisville, Ky.	28	11.3	10.8	10.0	11.4	22.5	33.6	38.4	41.1	44.9	April 2	46.7	Feb. 15, 1884	—1.8
Cairo, Ill.	45	39.0	39.9	40.3	40.9	43.5	45.5	47.4	49.1	54.8	April 4	54.0	Apr. 6, 1912	+0.8
Sandusky River Tiffin, O.	7	2.4	2.4	7.0	12.5	19.4	16.0	12.0	8.0	19.4	Mar. 26	18.5	April 2, 1904	+0.9
Maumee River Fort Wayne, Ind.	15	7.0	6.7	19.6	24.0	×	×	×	×	*26.1	Mar. 26	22.5	Mar. 8, 1908	+3.6

* Obtained by survey or subsequent measurement.

† Measurements made at another place after destruction of gauge.

× Dyke broke and let water pass around gauge.

EXHIBIT C

PASSENGER TRAINS MAROONED BY THE FLOOD OF MARCH, 1913

MAROONED AT	Train No.	Date of Train	ENROUTE From	ENROUTE To	TIME STOPPED	DISPOSITION OF PASSENGERS
Indianapolis Div.						
New Madison, Ohio..	35	March 24	Columbus	St. Louis	1:15 A. M., March 25	Train proceeded at 7:00 A. M., March 28, to New Paris, where passengers transferred over Bridge 92, and proceeded west on make-up train. Those who could not be cared for in dining and sleeping cars were taken to homes of nearby residents at New Madison.
West Liberty, Ohio...	3	March 24	Pittsburgh	Chicago	1:30 A. M., March 25	Train was being detoured over Big Four Railway and part of it went down with bridge over Mad River. Passengers were transferred a mile and a half to a relief train and returned to Urbana, where they boarded No. 27.
Urbana, Ohio.....	27	March 24	Pittsburgh	Chicago	1:00 A. M., March 25	Passengers that could not be cared for in sleeping cars were taken to hotels. Returned to Columbus March 27, arriving 6:23 P. M. Sent over Big Four to Crestline, leaving Columbus 10:00 A. M., March 28, and to Chicago over Ft. Wayne, arriving Chicago 9:30 P. M.
New Madison, Ohio..	24	March 24	St. Louis	Pittsburgh	12:40 A. M., March 25	Passengers that could not be cared for in sleeping cars taken to homes of residents of New Madison. Train proceeded to Bradford at 8:00 A. M., March 29. From Bradford passensengers went east with those of Nos. 4, 8 and 10.
Bradford, Ohio.....	4	March 24	Chicago	Pittsburgh	12:00 A. M., March 25	Passengers that could not be cared for in sleepers taken to R. R. Y. M. C. A. Make-up train left Bradford on morning of March 29th, transferring over bridges at Piqua and Marble Cliff, arriving Columbus 11:40 P. M. Left for Pittsburgh 1:50 A. M., March 30th, via Big Four to Crestline, P., F. W. & C., to Mansfield, Erie R. R. to Akron, Penna. Lines to Pittsburgh, arriving 3:05 P. M., March 30th.
Bradford, Ohio.....	8	March 24	St. Louis	Pittsburgh	4:30 A. M., March 25	
Bradford, Ohio.....	10	March 24	Chicago	Pittsburgh	5:00 A. M., March 25	
Cincinnati Div.						
Dayton, Ohio.....	13	March 24	Pittsburgh	St. Louis	11:30 P. M., March 24	Train held in Dayton Union Station until open detour route could be found, was caught by rising water on the morning of the 25th. Passengers taken over train shed to second story of station, where they remained until water went down enough to permit them to get back in the train on the 27th. Train left Dayton 10:10 P. M., March 29th. Left Xenia 10:00 A. M., March 31st, and arrived at Columbus, by carriage from Big Four Crossing, in the evening.

EXHIBIT C—Concluded

PASSENGER TRAINS MAROONED BY THE FLOOD OF MARCH, 1913.

MAROONED AT	Train No.	Date of Train	ENROUTE From	ENROUTE To	TIME STOPPED	DISPOSITION OF PASSENGERS
Pittsburgh Div.						
Trinway, Ohio.....	74	March 25	Columbus	Dennison	6:00 P. M., March 25	Passengers taken to hotel and residences in Trinway. Some returned to Columbus, others scattered to their homes.
Akron Div.						
Brink Haven, Ohio...	506	March 24	Cleveland	Columbus	Early A. M., March 25	Train returned to Killbuck March 29th, in the afternoon, and passengers transferred to Millersburg by carriage and to Orrville by special train and returned to Cleveland. Passengers slept in cars—had three sleeping cars.
Orrville, Ohio.....	520	March 25	Cleveland	Columbus	Early A. M., March 25	Passengers left Orrville by various P., F. W. & C. trains.
Mt. Vernon, Ohio....	521	March 25	Columbus	Cleveland	Early A. M., March 25	Passengers returned to Columbus March 26th.
Apple Creek, Ohio...	507	March 25	Columbus	Cleveland	Early A. M., March 25	Taken on March 26th to Cleveland, via Orrville and Alliance.
Zanesville Div.						
Dresden, Ohio.....	49	March 25	Trinway	Zanesville	11:00 P. M., March 25	Passengers slept in sleeping cars of B. & O. train which was marooned at same time and were given meals at Dresden hotels, until they found means of departure. Equipment used for "make-up" service between Trinway and Zanesville when W. & L. E. was opened south of Ellis, April 4th.
Dresden, Ohio.....	8 B. & O	March 25	Trinway	Zanesville	11:00 P. M., March 25	Train was being detoured for B. & O. R. R. Passengers slept in sleeping cars and were given meals at Dresden hotels until train could be returned to the B. & O. via Trinway, on March 29th.

In addition to these trains which were actually marooned, many trains were, after more or less delay enroute, gotten to terminal points, where they were held until an open route could be found for forwarding them. As facilities were available at these points for properly caring for the passengers, the only inconvenience suffered was the delay. Among those so held at intermediate terminals were:

At Columbus, Ohio: Nos. 121, 31, 45, 11, 25, 1st 21, 7, 1st 19, 2d 19, 3 and P., F. W. & C. No. 23, all of March 25th, and P., F. W. & C. No. 29 of March 24-25.

At Richmond, Ind.: Nos. 44, 2nd 24, 1, 9 and 45 of March 24th.

At Indianapolis, Ind.: Nos. 14 and 18 of March 24th; Nos. 6, 4 and 36 of March 25th.

At Logansport, Ind.: No. 9 of March 24-25.

EXHIBIT D

DETOURED FREIGHT TRAINS

In addition to the extensive detouring of passenger trains mentioned in this report, it was arranged to detour a great number of freight trains, principally of live or high class freight. The extent to which this was done will be seen from the following summary.

Handled by Other Roads FOR the Pennsylvania Lines West of Pittsburgh

By	From	Between	Trains	Cars	Train Miles
C.C.C.&St.L.Ry.	April 6 and April 7	Cleveland and Crestline	6	281	454.2
Erie R. R.	March 28 to April 5, inc.	Akron and Mansfield	77	2175	5159.0
B. & O. R. R.	March 30 to April 5, inc.	Warwick and Attica Junction	18	246	1233.0
	April 14 to May 11, inc.	Zanesville and West Zanesville	130	1794	* 650.0
	April 13 to May 13, inc.	Zanesville and Cambridge	38	1067	1076.0
B. & O. S. W. R. R.	March 27 to April 15, inc.	Seymour and North Vernon	96	1637	1440.0
W.& L.E.R.R.	April 24 to May 11, inc.	Ellis and Zanesville	23	556	174.8
N. Y. C. & St. L. R. R.	March 31 to April 6, inc.	Cleveland and Bellevue	30	1071	1914.0
T. & O. C. Ry.	March 29 and 30	Bucyrus and Centerburg	3	60	116.4
L.S.&M.S.Ry.	March 30 to April 7, inc.	Cleveland and Sandusky	45	2333	2700.0
	April 1–7, inc.	Cleveland and Toledo	19	963	2147.0
Zanesville Terminal	April 14 to May 7, inc.	Spangler and West Zanesville	112	1533	* 560.0
H. V. Ry.	April 8 to 27, inc.	Lancaster and Columbus	31	918	930.0
TOTAL			628	14,634	18,554.4

Handled for Other Roads BY the Pennsylvania Lines West of Pittsburgh

For	From	Between	Trains	Cars	Train Miles
C. C. C. & St.	March 26 to April 4	"CG" Tower, Anderson, Ind., & C.W. & M.Crossing west thereof	88	1614	*440.0
	March 26 to April 4	C. W. & M. Crossing and Anderson	2	0	* 10.0
	March 26 to April 4	C. W. & M. Crossing and Roy, Ind.	3	0	* 15.0
	March 26 to April 4	C. W. & M. Crossing and Roy, Ind. (Coal Dock)	1	0	* 5.0
	April 3 to April 5, inc.	Louisville and Jeffersonville	17	258	* 85.0
	March 30 to April 9, inc.	Springfield and Dayton	17	147	454.4
Erie R. R.	March 28 to March 31, inc.	Akron and Ravenna	10	204	248.0
B. & O. R. R.	March 29 to March 31	Akron and Ravenna	17	451	399.5
	April 3 to April 5	Canton and M. & C. Junction	8	124	68.0
	April 14 to May 13, inc.	Spangler and O. & L. K. Junction	101	1229	*505.0
W.& L.E.R.R.	April 7 and April 16	Trinway and Ellis	2	60	40.4
	April 17	Trinway and Morgan Run	1	29	17.9
L. & N. R. R.	March 29 to April 5, inc.	Louisville and Jeffersonville	22	372	*110.0
L.E. &W.R.R.	April 1 to April 5, inc.	Elwood, Indiana and CG Tower (Anderson)	3	18	47.4
Z. & W. Ry.	April 16 to May 7, inc.	In Zanesville	47	450	*235.0
C. H. & D. Ry.	April 15	Rushville, Ind., and Dayton, Ohio	2	46	122.1
TOTAL			341	5,002	2,802.7

*Not actual mileage: based on 5 mile minimum.

EXHIBIT E

RELIEF SUPPLIES, IN CAR OR TRAIN LOADS, MOVED BY PENNA. LINES TO THE FLOODED DISTRICT FOR EMERGENCY USE

Date	Shipped From	Destined To	Over Penna. Lines		No. of Cars	Remarks
			From	To		
March 28	Chicago	Dayton	Chicago	Crestline	16	U. S. Govt. train of rations.
March 29 to 31	Brooklyn Navy Yard	Dayton	Pittsburgh	Columbus	15	U. S. Govt. Supplies.
March 29 to 31	Brooklyn Navy Yard	Dayton	Pittsburgh	Columbus	18	U. S. Govt. Supplies.
March 27–8–9	Richmond	Dayton	Richmond	Miami City	4	Provisions.
March 29	Lima and Van Wert	Dayton	Lima	Crestline	8	Provisions.
March 28	Columbus	Dayton	Columbus	Dayton	1	
March 28–9–30	Canton	Dayton	Canton	Crestline	1	
March 28–9–30	Canton	Columbus	Canton	Crestline	1	
March 30–31	Canton	Columbus	Canton	Columbus	2	
March 30–31	Sebring	Columbus	Sebring	Columbus	1	
March 30–31	Alliance	Columbus	Alliance	Columbus	2	
March 30 to April 1	Baltimore	Dayton	Pittsburgh	Columbus	1	Red Cross Supplies.
March 31	Brooklyn	Dayton	Pittsburgh	Cleveland	1	U. S. Govt. Supplies.
March 31	Windber, Pa.	Columbus	Pittsburgh	Cleveland	1	
March 31	Johnstown, Pa.	Dayton	Pittsburgh	Cleveland	1	
April 1 to 4	Pittsburgh	Dayton	Pittsburgh	Columbus	1	
April 2–3	Chicago	Columbus	Chicago	Columbus	16	Chamber of Commerce.
April 4–5	Rahway, N. J.	Dayton	Pittsburgh	Dayton	1	
				Total	91	

This record is probably incomplete. In addition there were handled some l. c. l. shipments, free for relief work, and a number of troop and militia trains, of which no record was made.

EXHIBIT F

ESTIMATE MADE AT THE TIME OF THE FLOOD OF MARCH, 1913, OF EXTENT OF DAMAGE TO THE PENNSYLVANIA LINES, AND PROBABLE COST OF REPAIRING SAME.

	N. W. System	Central System	S. W. System	Total	Vandalia R. R.	G. R. & I. Ry.	Total Penna. Lines
Number of bridges lost	6	6	8	20	2	2	24
Number of bridges damaged	15	6	15	36	10	4	50
Number of spans lost	8	16	15	39	4	5	48
Number of spans damaged	14	11	23	48	33	5	86
Bridges lost—Length in feet of road	400	2,142	1,055	3,597	834	298	4,729
Bridges lost—Length in feet of single track	725	2,142	1,451	4,318	834	298	5,450
Bridges damaged—Length in feet of road	941	1,230	2,018	4,189	779	0	4,968
Bridges damaged—Length in feet of single track	1,675	1,230	3,334	6,239	779	0	7,018
Estimated cost of replacing above bridges	$265,336	$351,920	$409,860	$1,027,116	$108,000	$9,900	$1,145,016
Length of trestle built for single track, in miles	0.06	1.13	0.75	1.94	0.35	0.01	2.30
Length of trestle built for double track, in miles	0.25	.....	0.71	0.96	.....	.....	0.96
Length of trestle built for three tracks, in miles	.....	.....	0.02	0.02	.....	.....	0.02
Length of trestle built—Miles of road	0.31	1.13	1.48	2.92	0.35	0.01	3.28
Length of trestle built equivalent to miles single track	0.56	1.13	2.23	3.92	0.35	0.01	4.28
Estimated cost of above trestles	$ 39,954	$ 119,560	$ 176,630	$ 336,144	$ 24,500	$ 1,500	$ 362,144
Length of single track road requiring repairs, in miles	1.7	36.5	50.5	88.7	14.92	12.80	116.42
Length of double track road requiring repairs, in miles	16.5	0.7	23.9	41.1	0.57	.....	41.67
Length of three track road requiring repairs, in miles	1.1	.....	1.4	2.5	.....	.....	2.50
Length of four track road requiring repairs, in miles	2.2	.....	0.6	2.8	.....	.....	2.80
Length of road requiring repairs, in miles	21.5	37.2	76.4	135.1	15.49	12.80	163.39
Length of road requiring repairs, equivalent to miles single track	46.8	37.9	104.9	189.6	16.06	12.80	218.46
Estimated cost of above repairs to road	$ 210,800	$ 542,885	$ 642,605	$1,396,290	$ 176,200	$ 15,380	$1,587,870
Estimated damage to stations and other buildings	$ 5,350	$ 17,750	$ 47,800	$70,900	2,350	.....	$ 73,250
Estimated damage to equipment	3,800	6,350	74,135	84,285	9,078	.....	93,363
Estimated damage to telegraph lines	28,305	17,500	61,700	107,505	4,050	550	112,105
All other damage—Estimated cost	10,190	20,735	193,480	224,405	17,906	1,220	243,531
Total estimated loss	$ 563,735	$1,076,700	$1,606,210	$3,246,645	$ 342,084	$ 28,550	$3,617,279