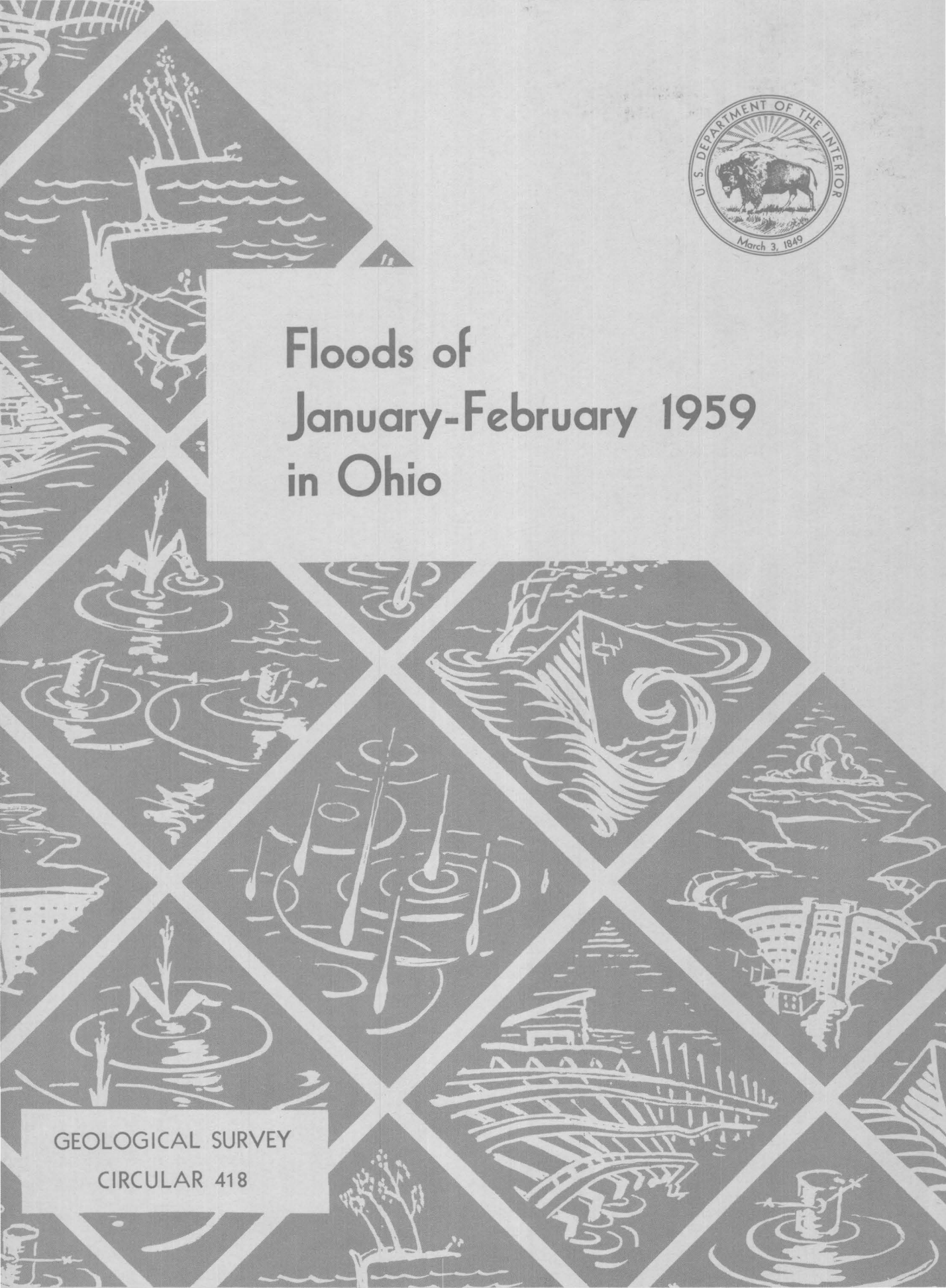

Floods of January-February 1959 in Ohio

GEOLOGICAL SURVEY

CIRCULAR 418

Floods of January-February 1959 in Ohio

By W. P. Cross and H. P. Brooks

Prepared in cooperation with the Ohio Department of Natural Resources, the Ohio Department of Highways, the Miami Conservancy District, the city of Columbus, and the Corps of Engineers, Department of the Army

GEOLOGICAL SURVEY CIRCULAR 418

Washington, D.C.
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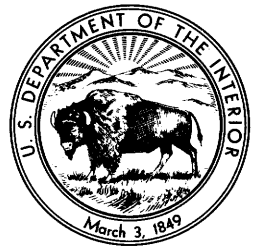
UNITED STATES DEPARTMENT OF THE INTERIOR

FRED A. SEATON, *Secretary*



GEOLOGICAL SURVEY

THOMAS B. NOLAN, *Director*

Free on application to the U.S. Geological Survey, Washington 25, D.C.

CONTENTS

ILLUSTRATIONS

TABLES

FLOODS OF JANUARY-FEBRUARY 1959 IN OHIO

By W. P. Cross and H. P. Brooks

ABSTRACT

The flood of January 21–24, 1959 was the worst flood since 1913 in a widespread area of Ohio. On a few streams the stages and discharges exceeded those of 1913. Sixteen lives were lost, and total damage was estimated to be in excess of $100 million. More than 17,000 buildings were flooded, and about 50,000 persons were evacuated.

Heavy rains on January 20 and 21 exceeded 6 inches in a narrow band extending northeastward from Cincinnati and Dayton through Columbus to Conneaut. More than 3 inches of rain fell on about half of the State. The ground was saturated by a storm on January 14–17, and was frozen, with some snow cover. Meteorological events and ground conditions were similar to those of March 1913, except that the storm lasted about 24 hours compared to 7 days in 1913, and the total rainfall maximum was slightly in excess of 6 inches, compared to more than 11 inches in 1913.

An outstanding feature of the flood was the high percentage of rainfall that was rapidly concentrated into stream channels. The rainfall intensities as well as the ground conditions contributed to the high runoff ratios.

Flood-control reservoirs constructed in the basins of the Mahoning, Muskingum, Scioto and Miami Rivers since the 1913 flood markedly reduced the peak flows and flood damage. Previous maximum storage contents were exceeded in several reservoirs in the western part of the Muskingum River basin, the Delaware Reservoir in the Scioto River basin, and the retarding basins of the Miami Conservancy District.

Three weeks after the January storm a similar storm crossed the northwest corner of the State. More than 3 inches of rain fell on parts of the Maumee River and Sandusky River basins on February 9–10. The resulting flood, greatly complicated by ice jams, was much lower in stage and discharge than the 1913 flood, and was generally about equal to the floods of 1937 and 1950. Damage was severe in some localities, and exceeded $3 million. Several cities were flooded twice in 3 weeks.

INTRODUCTION

The flood of January 21–24, 1959, caused more than $100 million damage in Ohio as reported by the Civil Defense Corps. Sixteen lives were lost. Several cities, including Columbus, Mount Vernon, Newark, and Chillicothe, were partly inundated; flooding at Chillicothe is shown in figure 1. The flood was widespread, and only the northwest and southeast corners of the State being spared by the main storm path. Rains, beginning generally on the night of the 20th and continuing through the 21st, were of high intensity along a northeast-southwest line bisecting the State from Cincinnati to Conneaut. Twenty-four-hour rainfall intensity records were broken at some Weather Bureau stations. The heavy rains fell on ground saturated and frozen by rain and snow during January 14–17. The percentage of rainfall reaching streams was well in excess of that usually recorded and approached complete runoff on some areas. Generally the devastating flood was second only to the 1913 flood, and in some areas the stages and discharges were unprecedented. Flooding extended from southern Indiana to northwestern Pennsylvania.

Three weeks after the January flood another storm crossed the northern part of the State. The January flood had broken up the ice, from 14 to 18 inches thick, on many northern streams, but removed little of it. Rains on February 9–10, fell in amounts exceeding 3 inches on parts of the Maumee and Sandusky River basins. The resulting floods were complicated by ice jamming, and the inundations were higher and more protracted because of backwater from ice. Findlay, Fremont, and some other cities were flooded twice in 3 weeks; flooding at Fremont is shown in figure 2. The flooding extended across the Wabash River basin in Indiana and the northern part of Ohio.

The two closely associated floods seriously affected all of the State except the southeastern counties. Of Ohio's 88 counties, 62 received flood relief funds from the American Red Cross.

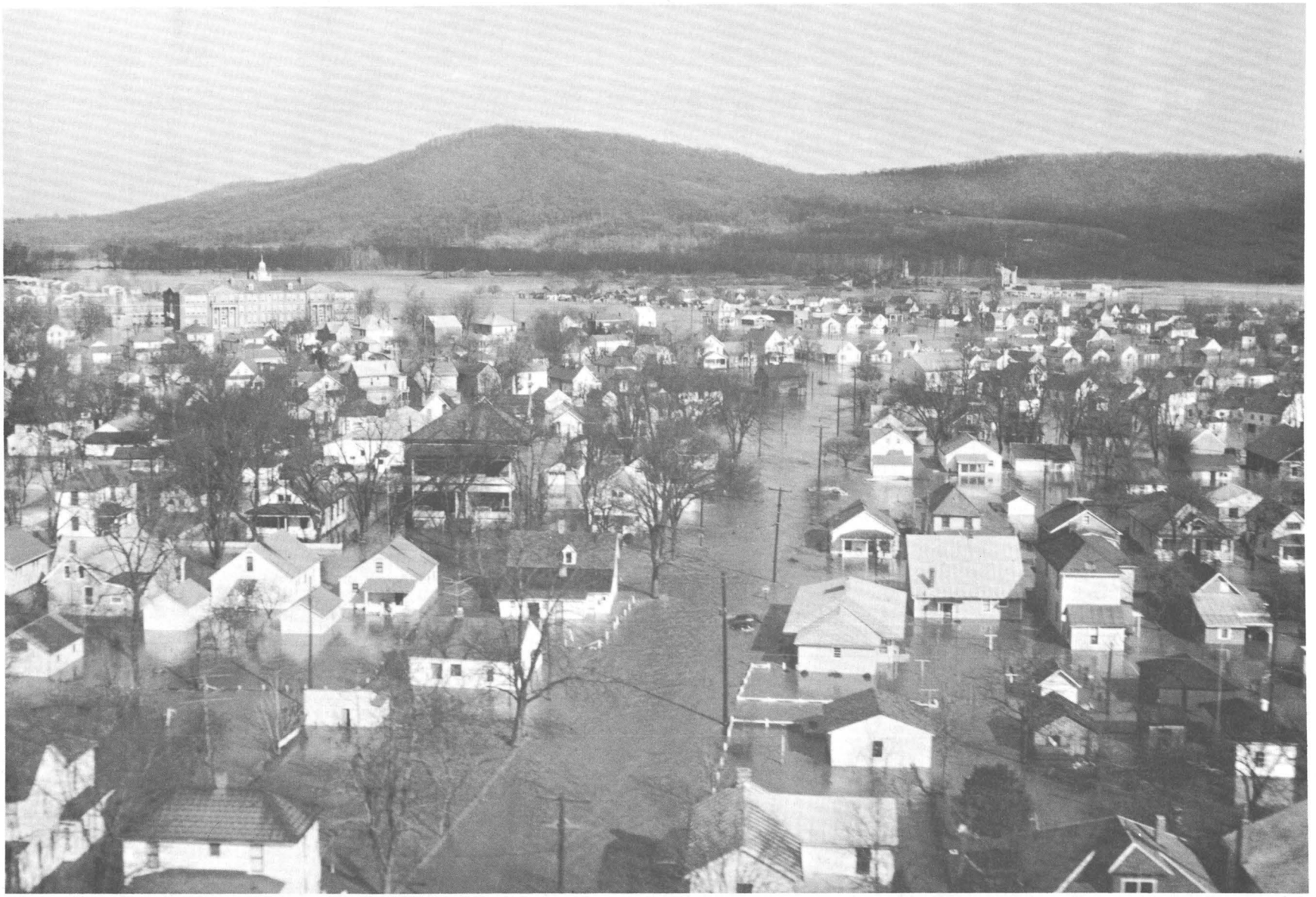


FIGURE 1.—Aerial photograph of east end, Chillicothe, Ohio, January 23, 1959. Photograph by Chillicothe Gazette, James E. Leasure, Jr.

FIGURE 2.—Aerial photograph of downtown Fremont, February 11, 1959. Photograph by George Demmel, Fremont.

Immediately following the flood a program of surveys and studies was begun through cooperative efforts by the State, Federal, and other agencies concerned. In addition to the stream-gaging records and flow measurements and other information summarized herein, flood-damage studies, flood-crest profiles, maps of inundated areas, and other investigations were undertaken through the prompt action by Governor DiSalle and the General Assembly of Ohio. Results of all these surveys were not available for this preliminary report, which is to supply information needed for immediate planning. Included in this report are general descriptions of the floods, peak discharges for the present and previous record floods at selected gaging stations, peak stages and discharges at many miscellaneous sites, daily discharge data for selected gaging stations, and a summary of flood damages. A more comprehensive report covering both floods in the several States concerned is planned and will include all of the pertinent gaging-station records and miscellaneous peak-flow measurements as well as the results of other studies.

Because flood-control reservoirs markedly reduced flood stages and discharges, thereby greatly reducing the potential flood damage, a summary of storage records for 28 reservoirs is included with other basic records in this report.

ACKNOWLEDGMENTS

The documentation of basic streamflow records in Ohio is a part of a continuous cooperative program with the State Department of Highways; the State Department of Natural Resources; the Miami Conservancy District; the city of Columbus; and the Corps of Engineers, Department of the Army. The preparation of this report is part of a supplemental investigation program financed through a special cooperative agreement between the Survey and the Ohio Department of Natural Resources, H. B. Eagon, director.

Because of the need to perform the fieldwork and the office computations pertaining to flood-peak discharge as promptly as possible, about 30 hydraulic engineers from all sections of the country were assigned to the Columbus district during the 3-month period after the floods. The fieldwork and office work of determining peak discharges by indirect methods were directed by Richard H. Tice, flood specialist, midcontinent area under general supervision of the Floods Section, Tate Dalrymple, chief, Washington, D.C.

The fieldwork and office work of collecting and tabulating basic records of streamflow as well as the associated analyses for the special flood investigations were primarily the responsibility of the Columbus district office under the supervision of L. C. Crawford, district engineer.

Many Federal, State, municipal and private agencies supplied information pertinent to the investigations. The isohyetal maps and other meteorological data, and the information on flood damage were furnished by the Division of Water, Ohio Department of Natural Resources, C. V. Youngquist, chief. Information on water-supply and sewage-disposal plants was provided by the State Board of Health (Waring, 1959). Acknowledgment of other data furnished is made where the data appear in the text.

GENERAL DESCRIPTION OF THE FLOODS

The severe cold weather of December 1958 froze the ground to depths ranging from 6 to 24 inches. Ice 18 inches thick was formed on the streams in northern Ohio; an ice jam in Riley Creek near Ottawa is shown in figure 3. January 14–17 a storm produced up to 1.84 inches of moisture, which fell as snow in the northern part of the State and rain changing to snow in the southern part. The ground was thus saturated, frozen, and covered with small amounts of snow on January 19.

For several days prior to January 21 a persistent high-pressure area was located off the South Atlantic coast. At the same time an area of low pressure formed over the Great Plains. The combined circulation of these opposing systems transported a large mass of warm, moist air from the Gulf of Mexico to the Ohio Valley. The storm center did not become well established until about midnight January 20–21, when it was centered over northern Arkansas. Then it traveled rapidly northeastward. A sharp trough of low pressure extending southwest-northeast moved across northwestern Ohio on January 21. Warm air extended over southern Ohio by 1 a.m. on the 21st, and thunderstorms broke out as far north as Columbus. By noon the low-pressure center had deepened and was centered just northwest of

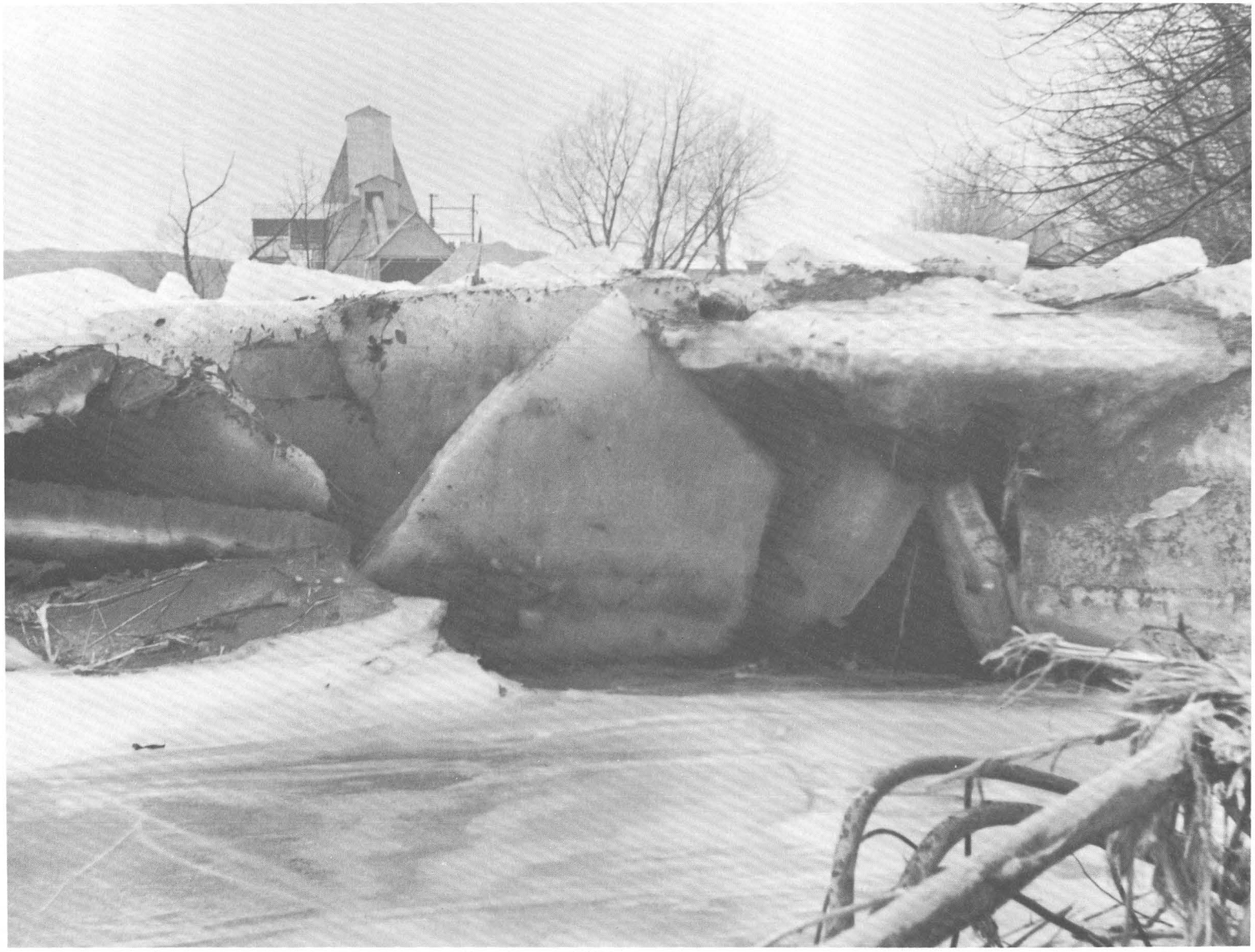


FIGURE 3.—Ice jam in Riley Creek near Ottawa, Ohio, February 19, 1959. Photograph by Richard E. Landick, Jr., Ottawa.

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Cincinnati. Conditions resembling a warm front developed, and the zone of convergence associated with this frontal activity moved across the State during the day. Most of the flood-producing rain came between midnight January 20–21 and noon on the 21st. The largest amounts, some exceeding 6 inches, were measured in a narrow band extending from Cincinnati and Dayton northeastward across Columbus to Conneaut. This band lay 50 to 100 miles south of the path of the main storm center in a position where there was a maximum of convergence in the windflow aloft. Many thunderstorms broke out in this zone of convergence, which added to the total precipitation. Surface temperatures rose well above freezing, contributing to the snowmelt.

The amount of water in the snow cover that contributed to the flood is difficult to estimate. In the southern part of the State the amount of water in the light snow cover was insignificant. In the north, where snow was deeper, the rainfall was not as intense. Estimates of the depths of water from the snow cover are shown in the section of this report on rainfall and runoff comparisons.

By midnight of the 21st the low-pressure center was northeast of Lake Huron. As the center moved northeast its cold front swept across the State, passing Columbus about 6 p.m. and leaving the State by midnight. This brought an end to the rain.

An isohyetal map of the storm rainfall for January 19–21 is shown on figure 4. It is noteworthy that the area reporting 3 or more inches of precipitation crossed the State in a pattern that covered the headwaters of all major river basins except those of the Maumee and Hocking Rivers. This storm pattern accounts for much high runoff on medium-size drainage areas and the associated widespread flooding. Cumulative graphs of precipitation for selected weather stations are shown on figure 5. Rainfall rates per hour were from 0.50 inch to 0.75 inch, and some localities reported hourly rates up to 1.1 inches. The areas enclosed by the isohyets of figure 4 were planimetered, with results as shown in table 1.

On February 9–10 a similar low-pressure area crossed north of Ohio, with the zone of convergence lying along the Wabash River in Indiana and the Maumee and Sandusky River basins in Ohio. The ground was saturated from the January storm and still frozen. Snowmelt added to the runoff and ice in the streams added to the flood stages. In some areas the February stages exceeded those in January. Rainfall exceeded 3 inches over extensive areas, and most of the Lake Erie basin in Ohio received more than 2 inches. The isohyetal map of figure 6 shows the storm rainfall for February 9–10.

TABLE 1.—*Precipitation-area relation for storm of January 19–21, 1959*

Precipitation (inches)[1]	*Area (square miles)*
6[2]	165
5	4,160
4	9,660
3	18,200
2	36,900
1[3]	[4]41,262

[1] Equaled or exceeded
[2] Maximum reported, 6.15 inches.
[3] Minimum reported, 1.07 inches.
[4] Entire State.

MAHONING RIVER AND TRIBUTARIES

The January 21 flood in the Mahoning River basin was the highest since the construction of the Berlin and Mosquito Creek flood-control reservoirs. The reservoirs held back the runoff, but uncontrolled tributaries, principally the West Branch Mahoning River and Eagle Creek, caused high stages and severe damage. More than 7,000 workers were idled when flooded industries suspended operations. At Warren 1,750 persons were forced from their homes. At Newton Falls on the West Branch the water plant was shut down and 300 removed from their homes. The flood waters of Crab Creek, a small tributary, added to the flood at Youngstown, where 1,000 people were evacuated. Hydrographs for selected gaging stations in the Mahoning River basin are shown on figure 7. Total damage in the basin exceeded $16 million.

Estimates by the Corps of Engineers (Engineering News-Record, Feb. 5, 1959) indicate that the reservoirs reduced the stage at Youngstown by 5.3 feet, and prevented additional damage of more than $30 million.

MUSKINGUM RIVER AND TRIBUTARIES

The 14 flood-control reservoirs of the Muskingum Conservancy District, operated by the Corps of Engineers, reduced flooding by the Mus-

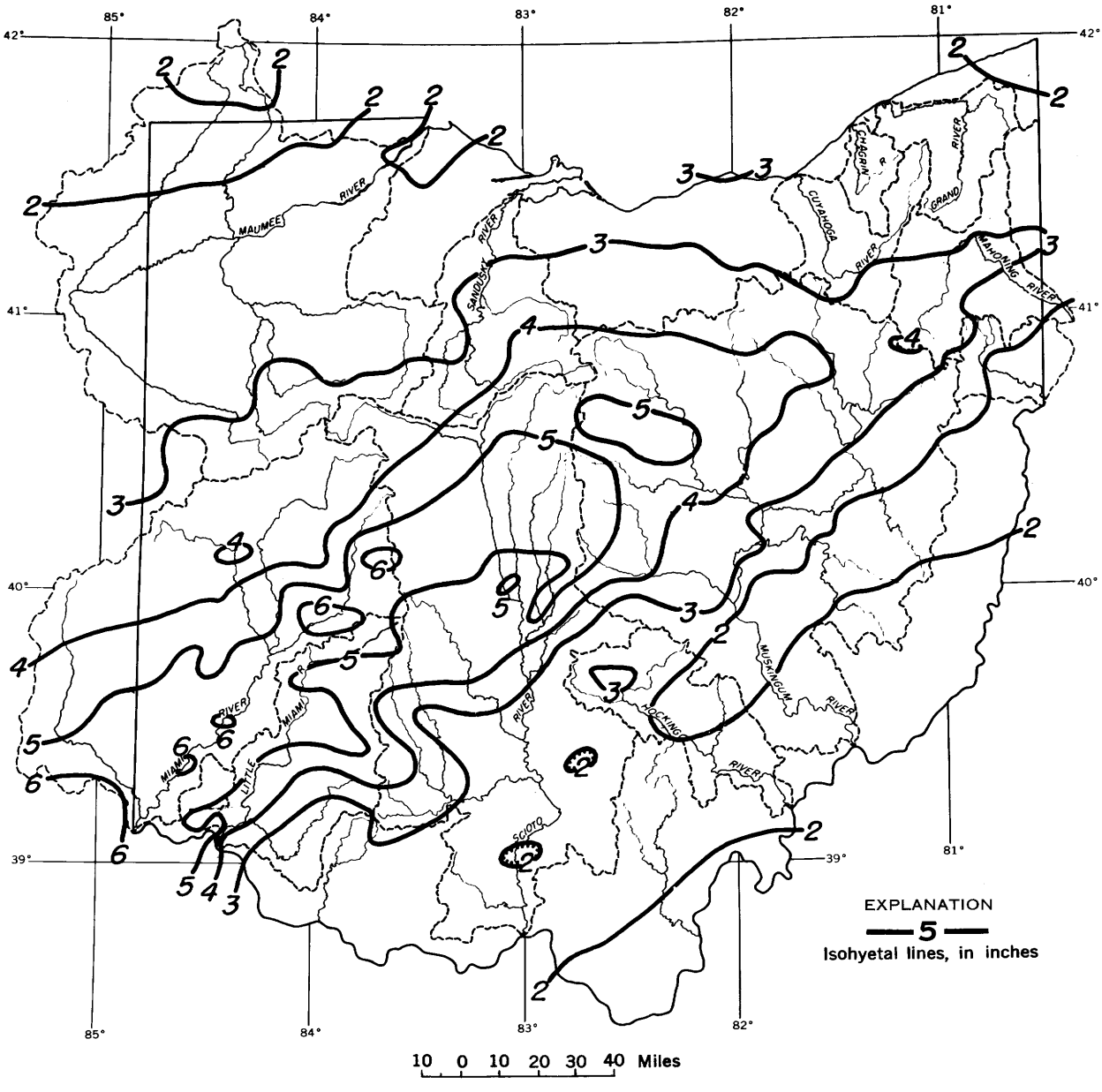

FIGURE 4.—Isohyetal map of Ohio, showing storm rainfall January 19–21, 1959.

kingum River. However, uncontrolled tributaries in the western part of the basin were in the area of excessive rainfall, and the floods on some streams exceeded all previous records, including in some places those of the flood of 1913. Hydrographs for selected gaging stations in the basin are shown on figure 8. Total damage in the basin exceeded that for any other major river basin.

Mount Vernon had the worst flood in its history when the levee along the Kokosing River gave way and water rose rapidly in an extensive residential district, flooding about one-third of the city. About 3,500 of the total population of 16,000 were forced from their homes. The water plant was damaged, there was a power failure, and only one road into the city remained passable. The peak flow of the Kokosing River at Millwood, downstream from Mount Vernon, was nearly twice that of the 1913 flood. Dry Run and other small tributaries added to the damage.

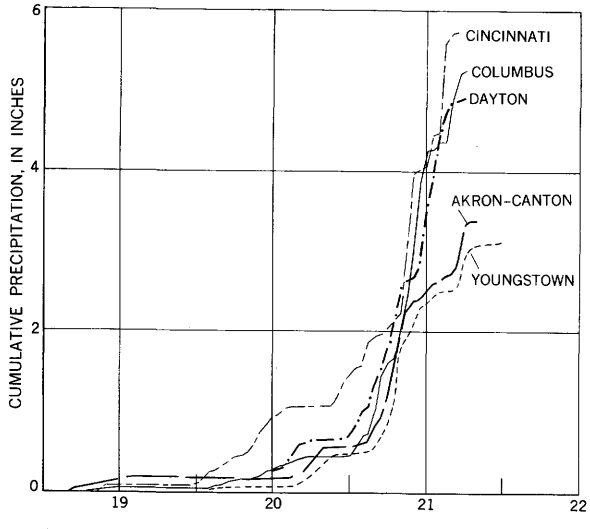

FIGURE 5.—Graphs showing accumulated rainfall, January 19–21, 1959.

Other uncontrolled tributaries of the Walhonding River caused similar disaster. In Mansfield, on Rocky Fork, more than 200 people evacuated their homes. In Shelby, on a tributary of Black Fork, damage was more than $300 thousand. The village of Bellville, on Clear Fork, was completely isolated for a time. Wooster was severely flooded as were many communities in the Killbuck Creek area. Killbuck Creek at Killbuck reached a stage within a few hundredths of a foot of the record established by the cloudburst flood of August 1935. Total damage in Holmes County approached $5 million. Water plants were damaged in Millersburg, Wooster, and Mansfield.

The flood extended into the Tuscarawas River basin. At Rittman, on Chippewa Creek, the water supply was contaminated. In Barberton 175 people were evacuated. In Canton, at the confluence of Middle Branch and Nimishillen Creek, industrial damage was reported at nearly $5,250,000. Four hundred people were forced from their homes. Other small communities were flooded, and bridges washed out, with extensive highway damage.

At Newark, on the Licking River, about 1,500 people were evacuated. The flood stage at the gaging station at Toboso, downstream from Newark, was more than 1 foot above the 1913 record. The water service was interrupted, and the water-supply dam weakened so that it washed out in the February flood. The sewage disposal plant was put out of service. At Zanesville the Licking River flooded 25 city blocks of the western part of the city. The North Fork of the Licking River washed out several miles of track of the Baltimore and Ohio Railroad.

The combined storage in the flood-control reservoirs reached 54 percent of the combined capacities at spillway elevations, compared to about 47 percent for the highest previous record of storage in June 1947. Estimates of the reductions in stage of the Muskingum River by the reservoirs, based on preliminary estimates by the Corps of Engineers, are 11.9 feet at Coshocton, 11.4 feet at Zanesville, and 7.7 feet at McConnelsville. Without the reservoirs the total damage in the Muskingum River basin would have been increased by about $13 million, and the Muskingum reservoirs are estimated to have reduced damages along the Ohio River by an additional $7,600,000.

SCIOTO RIVER AND TRIBUTARIES

The headwaters of the Scioto River and several of its tributaries received heavy concentrations of rainfall during January 21–22, 1959. The one flood-control reservoir in the basin, Delaware Reservoir on the Olentangy River, stored all the runoff from 381 square miles and reduced flood stages and damages at downstream points. The three water-supply reservoirs of the city of Columbus had slight controlling effect inasmuch as their design did not include flood storage capacities. However, Hoover Reservoir on Big Walnut Creek stored more than 2 inches in equivalent depth on its drainage area of 190 square miles, but the peak stage downstream at the gaging station on the same stream at Rees was 1.5 feet above the 1913 maximum stage. The peak on Alum Creek, not affected by storage, was over 5 times the mean annual flood, and 6 feet higher in stage than the highest flood in the past 35 years. Hydrographs for selected gaging stations in the basin are shown on figure 9.

At Columbus a levee along Dry Run, a small tributary of the Scioto River, was overtopped by the flood waters of the river, releasing water into the west side of the city. At the same time Alum and Big Walnut Creeks, in the eastern part of the city, were at unprecedented stages. Gas service was interrupted for several days because of water in the lines. Two dwellings were destroyed, and more than 100 were badly damaged. Hundreds

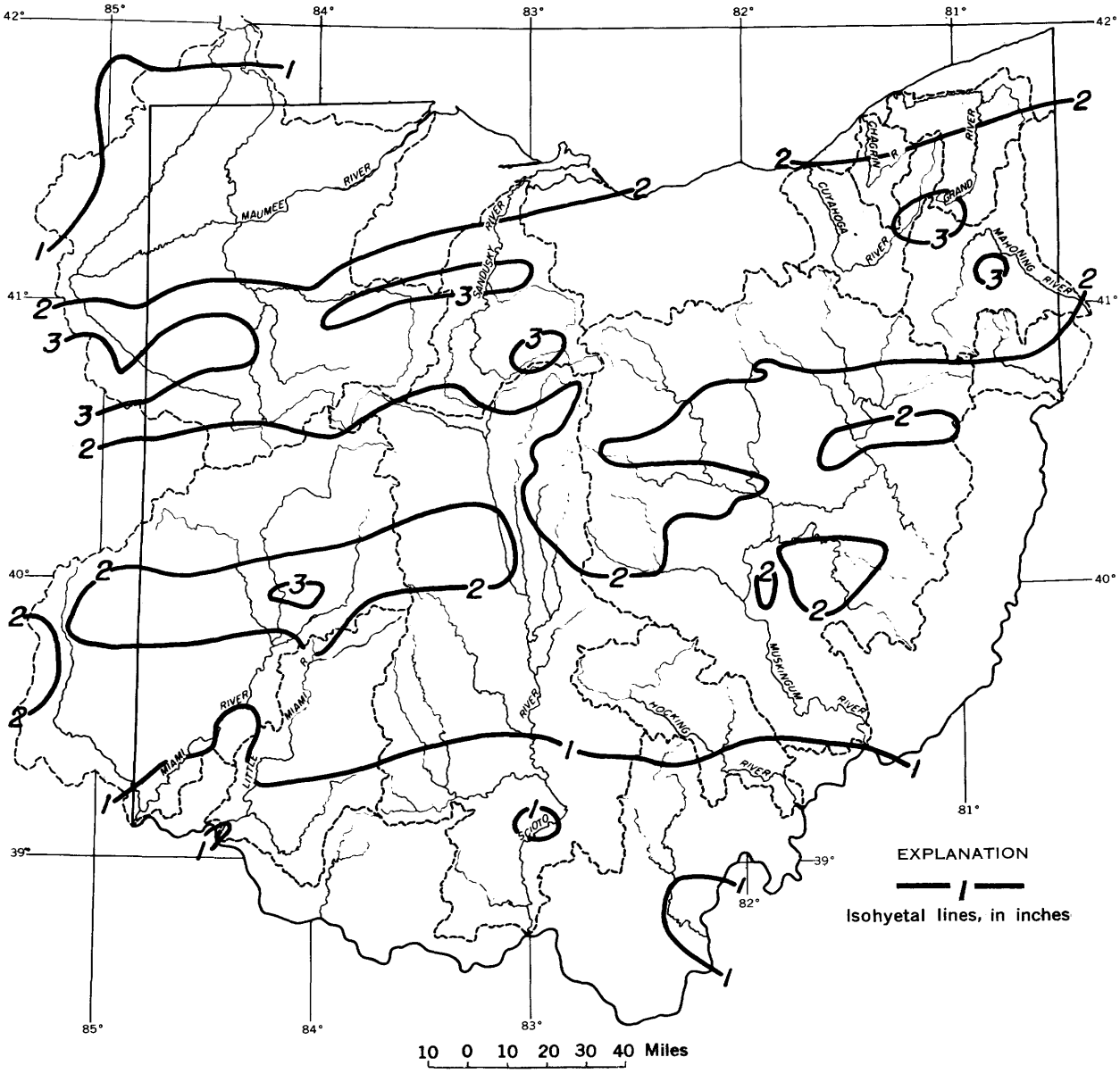

FIGURE 6.—Isohyetal map of Ohio, showing storm rainfall February 9–10, 1959.

of automobiles were submerged. The Red Cross cared for 3,200 evacuees at improvised shelters.

Utilities were damaged extensively. The Circleville water plant and the sewage disposal plants at Kenton, Marion, and Chillicothe were put out of operation. At Chillicothe one-third of the city was flooded and 9,000 people evacuated (see fig. 1).

The January 1959 runoff of the Scioto River at the Chillicothe gaging station was 4.36 inches, adjusted for storage in reservoirs. This high runoff is less than half of the runoff for January 1937, at the same station, which was 9.03 inches. The peak flow at this station on January 23 was 144,000 cfs, compared to 101,000 cfs on January 23, 1937, but the March 1913 peak flow was 260,000 cfs. These comparisons serve to indicate that the Scioto River has had, and can have again, much greater floods in volume and in peak rate than the 1959 flood.

Preliminary estimates by the Corps of Engineers of the reductions of peak stages by storage in

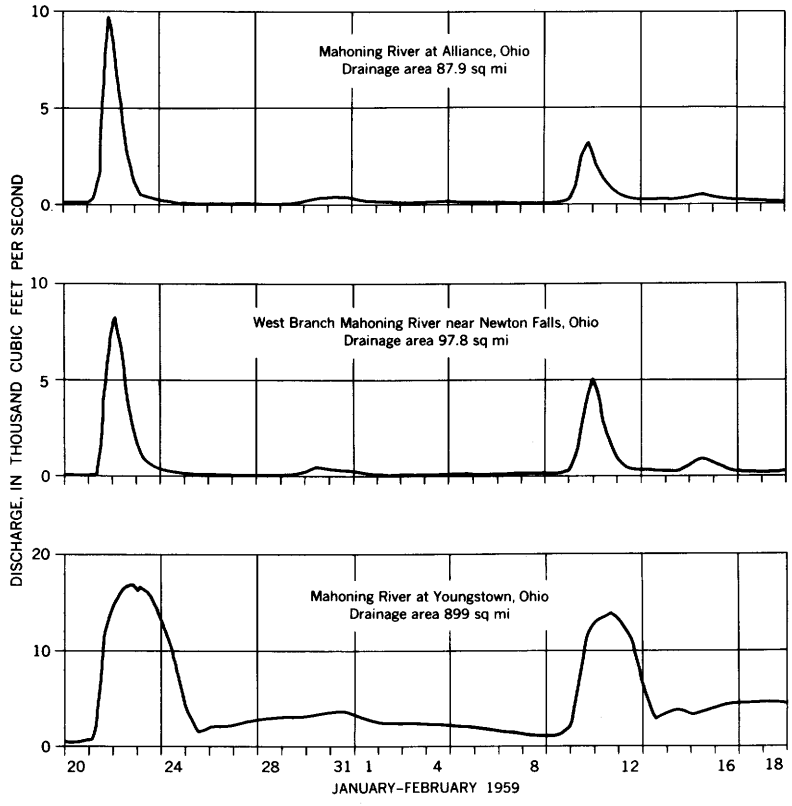

FIGURE 7.—Graphs of discharge at selected gaging stations in the Mahoning River basin, January 20 to February 18, 1959.

Delaware Reservoir are 14 feet at Delaware, 9.2 feet at Worthington, 4.2 feet at Columbus, and 2.9 feet at Chillicothe. Thus the value of flood control and the need for additional control in the Scioto River basin were underlined by this disaster. About $6 million damage was prevented by the reservoir.

LITTLE MIAMI RIVER AND TRIBUTARIES

The January 21, 1959, flood on the Little Miami River exceeded the 1913 flood in a reach extending through Fort Ancient to the mouth of Todd Fork at Morrow. Damage was locally severe, but was confined largely to the small communities located on the flood plain. These included Spring Valley, Corwin, Morrow, South Lebanon, and Kings Mills. Total damage in the entire basin exceeded $5 million. At Spring Valley 45 homes were evacuated, and 300 persons were forced from their homes at South Lebanon. The town of Kings Mills was completely inundated. Two hundred people were evacuated at Morrow. Farther south, the rainfall was less, and the East Fork of the Little Miami River had only a minor flood.

MILL CREEK

The area drained by Mill Creek is highly industrialized. The flood plain is broad and flat, and the stream ordinarily flows in a shallow trench not far below flood-plain level. The entire basin was in the area of excessive rainfall. Partial protection is given the lower part of the basin by the flood-control reservoir on West Fork of Mill Creek, which held back a runoff of more than 5 inches on the 29.5 square mile drainage area. Damage was general throughout the valley, but was more severe at Reading where a broken levee released water into a residential district.

MIAMI RIVER AND TRIBUTARIES

A large part of the Miami River basin was in the area of excessive rainfall in January 1959. The five retarding basins of the Miami Conservancy District minimized flood stages and damages on the main streams, but uncontrolled tributaries

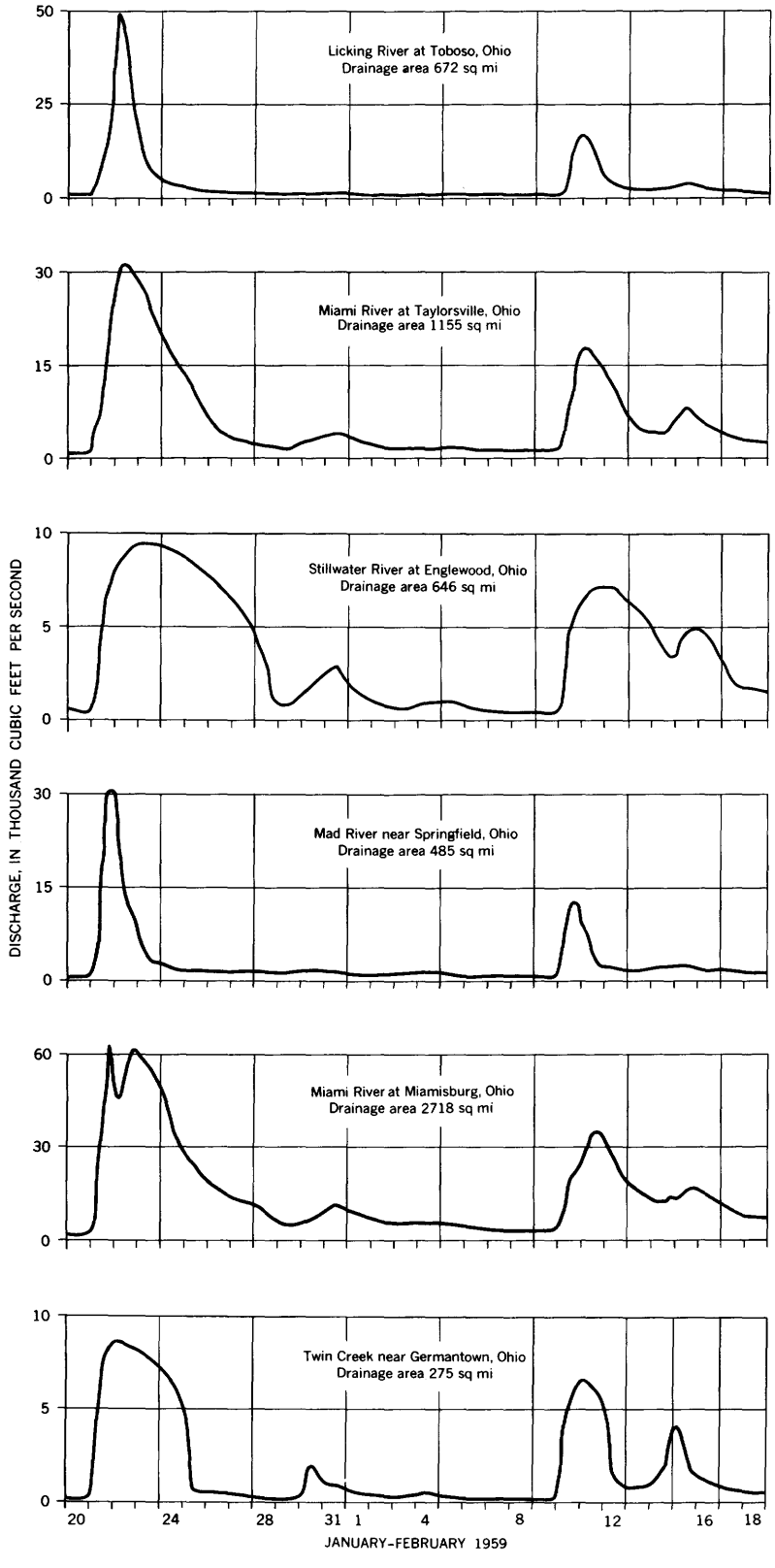

FIGURE 8.—Graphs of discharge at selected gaging stations in the Muskingum River basin, January 20 to February 18, 1959.

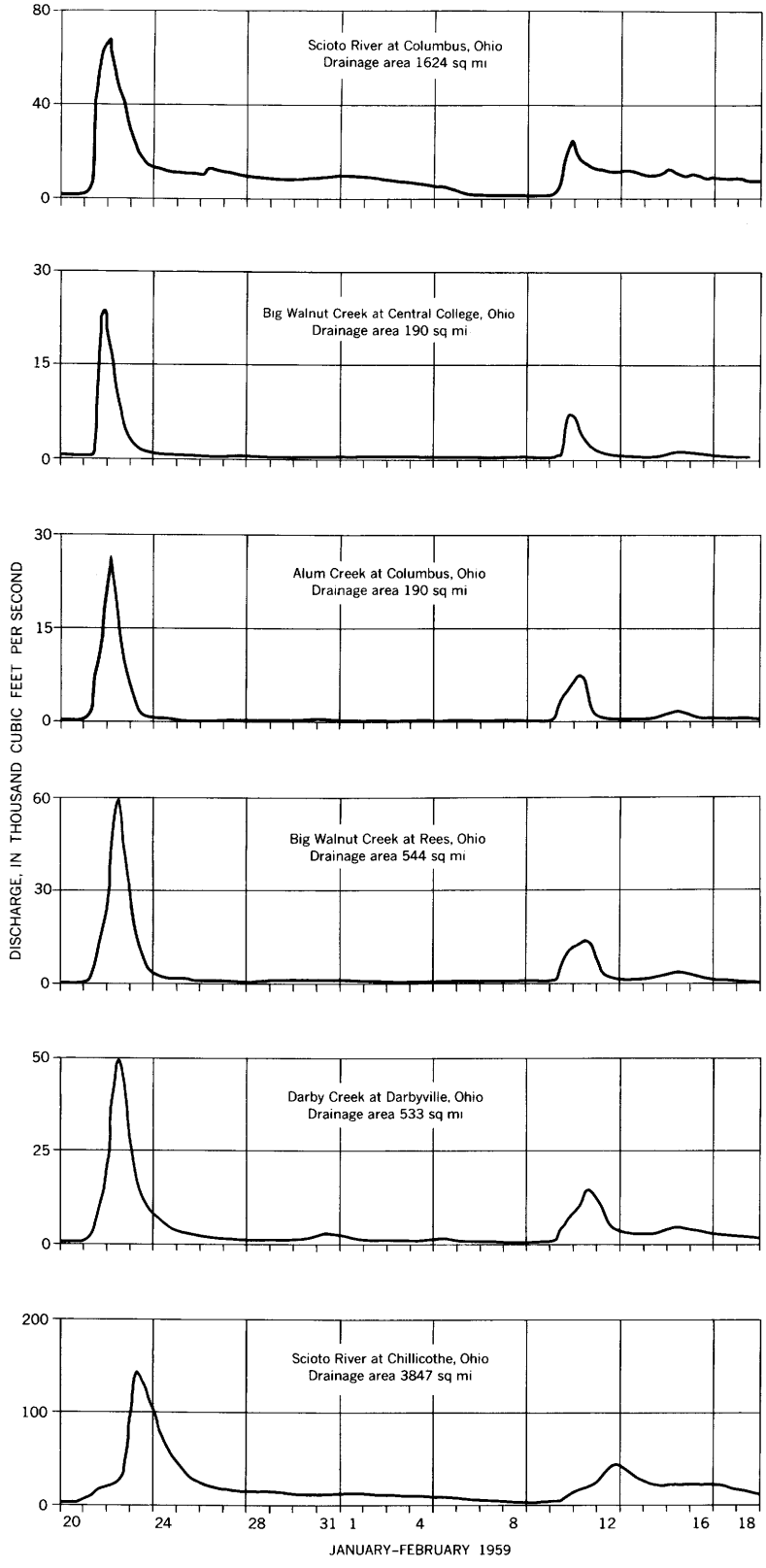

FIGURE 9.—Graphs of discharge at selected gaging stations in the Scioto River basin, January 20 to February 18, 1959.

caused widespread damage. Some damage on the Miami River below the reservoirs was caused by encroachments on the flood plain. Hydrographs for selected gaging stations are shown on figure 10.

In Springfield, Buck Creek reached a stage exceeded only by the record floods of 1913 and 1929. Industrial damage was extensive. Train service was completely disrupted by washed-out tracks. Many homes were damaged, and the total loss approached $4 million. Below Springfield the Mad River forced the evacuation of 200 homes in Snyderville. Roads, streets, and bridges were damaged over a wide area.

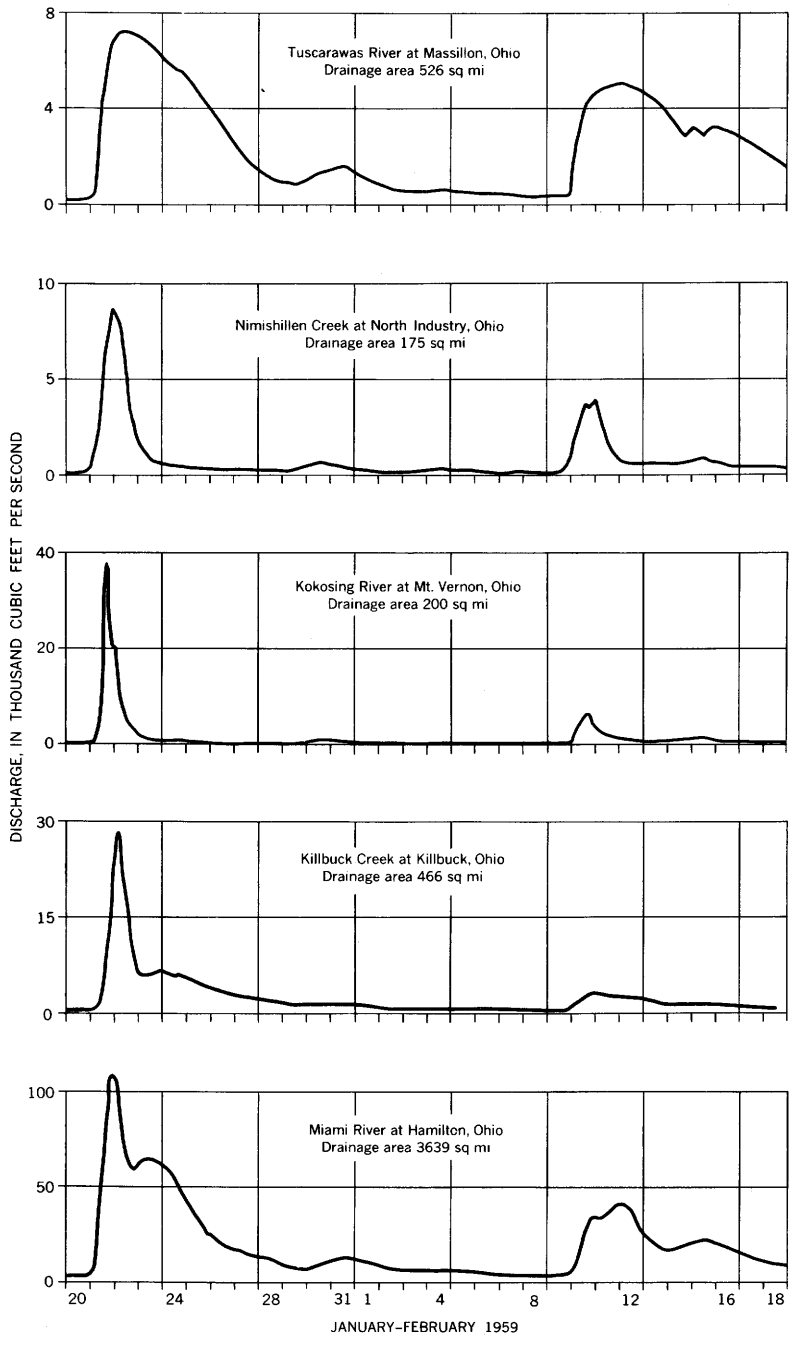

FIGURE 10.—Graphs of discharge at selected gaging stations in the Miami River basin, January 20 to February 18, 1959.

North of Dayton the Miami and Stillwater Rivers caused widespread but minor damage. At Piqua and Troy floodwater damaged streets and basements and severely interrupted business. In Dayton and its suburbs 1,500 people were evacuated and damage was reported to be $500 thousand. Runoff of several small Miami River tributaries was unusually high. Talawanda Creek forced the evacuation of 500 homes in New Miami, and interrupted gas service. In the rural areas several bridges were destroyed, and agricultural damage was reported throughout the basin.

The high runoff from the small uncontrolled tributaries between Miamisburg and Hamilton caused the peak flow of 108,000 cfs at Hamilton on the night of January 21st, about 20 hours before the lower main-river peak. The peak on Talawanda Creek was 44,500 cfs from a drainage area of 311 square miles, and Clear Creek, Elk Creek, Dicks Creek, and other small tributaries had similiar high peak rates of runoff.

The town of Venice was almost entirely submerged. Industries were shut down in Hamilton and 100 families were forced from their homes. In Middletown 100 homes were evacuated and in the residential districts much damage was caused by a series of fires and explosions.

The combined peak storage of the 5 flood-control retarding basins was 137,600 acre-feet. This storage exceeds the previous highest combined storage (which occurred in January 1937) since the construction of the project, though it represents only 16 percent of the combined storage at spillway level. Storage in three of the basins—Taylorsville, Huffman, and Germantown—exceeded all previous records.

MAUMEE RIVER AND TRIBUTARIES

The January 1959 flood in the Maumee River basin was largely confined to the southern and eastern tributaries. Ice in the streams was as much as 18 inches thick, and this added to flood stages and to periods of inundation. Total damage in the basin in January approached $3 million. Hydrographs for the flood period for selected gaging stations are shown on figure 11.

Many roads were temporarily blocked. The flat terrain reduced velocities and spread the flood across the lowlands thus preventing major damage to roads and bridges. Much damage was caused by basement flooding. In Findlay, on the Blancherd River, damage to homes and businesses amounted to $700 thousand. Lima had 125 evacuees.

The Blanchard River at Findlay reached a stage of 16.11 feet on January 22, the highest stage since March 1913; on February 11, the stage reached 16.76 feet. On the other streams, such as the Auglaize River near Fort Jennings, the January peak was the higher.

The February flood was higher at many points in the basin, and was more widespread. Findlay was flooded a second time, with 650 persons evacuated and damage of about $1½ million in February. The thick ice was not entirely removed by the January flood (see fig. 3) and ice jams contributed to the damage in February. Town Creek flooded Van Wert, forcing 750 people from their homes. Many small towns were similarly affected, and the total damage in February may have approached the January total. Ice jams caused unprecedented stages on the Maumee River, but damage was minor.

SANDUSKY RIVER AND OTHER LAKE ERIE TRIBUTARIES BETWEEN THE MAUMEE AND CUYAHOGA RIVERS

The January flood in the Portage River basin caused more than $2 million damage. Basement flooding was widespread and many areas were temporarily isolated by flood-blocked roads. In the Sandusky River basin the January damage exceeded $6 million. Ice jams caused prolonged high stages on the Sandusky River. Stages generally were about the same as for the 1937 flood, and slightly lower than the record flood of 1913. In Bucyrus the power and water services were temporarily suspended. Thirty homes were evacuated in Tiffin, and northward the ice-blocked Sandusky River gouged new channels through adjoining farmland. At the gage near Mexico, where there was no backwater from ice, the January peak was almost identical, in stage and discharge, with the 1937 flood. An ice jam downstream from Fremont caused most of the city to be flooded, with water about 2 feet deep in the business section. In this city of about 16,000 people, 1,500 were evacuated. Farther east, at Vermilion on the Vermilion River an ice jam caused 520 homes to be evacuated, and the Black River flooded the center of Elyria, blocking

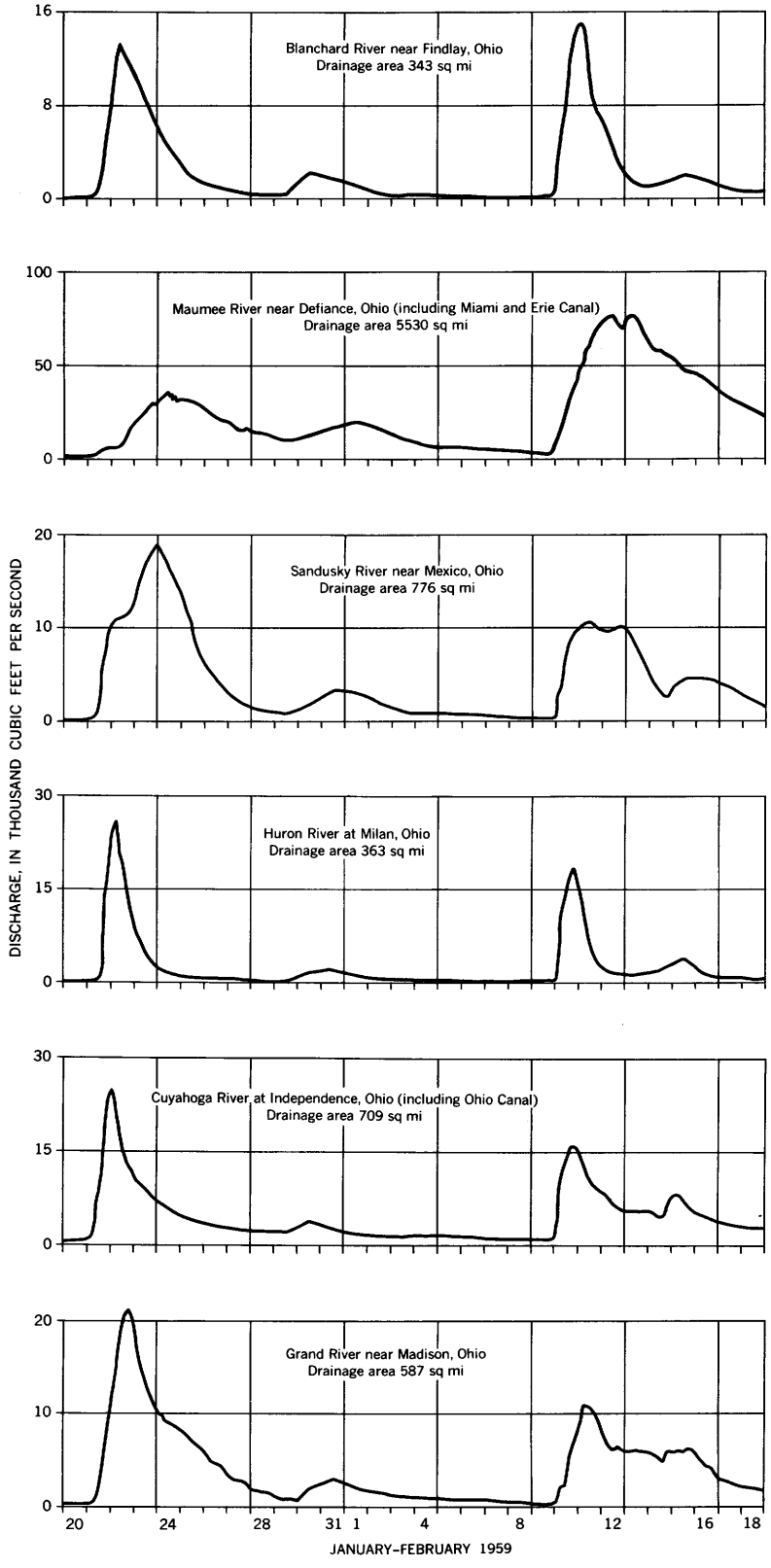

FIGURE 11.—Graphs of discharge at selected gaging stations on Lake Erie tributaries, January 20 to February 18, 1959.

streets and causing business establishments to suspend operations. Stages were high in the Huron River basin.

Less than 3 weeks after the January flood another high-water period, with ice jams, hit the lower Sandusky River basin. Discharges were substantially lower than for the January flood, but the stage at Fremont was slightly higher and prolonged by a heavy ice jam (see fig. 2). In this city, 1,000 people were evacuated from their homes, not counting more than 200 that had not returned after the January flood. The resulting damage and hardship to inhabitants was greater in February than in January. Farther east the February flood peaks, though high, were well below January stages. Hydrographs for selected gaging stations in Lake Erie tributaries are shown on figure 11.

CUYAHOGA RIVER

The Cuyahoga River has had few floods in the past because of the storage in many lakes and ponds and in the Akron water-supply reservoirs. The January 1959 flood at the gaging station at Independence, upstream from Cleveland, surpassed all previous records since 1921 and approached those of the flood of 1913. Damage in the basin approximated $2 million. The damage was most serious in the downstream part of the river. Eight hundred persons were reported evacuated in the vicinity of Cleveland, where damage was particularly severe in the industrial area. The municipal park system and the Cleveland Zoo (on Big Creek) had considerable loss. The valley area from Peninsula to Valley View was inundated and many homes were evacuated.

The February flood at Independence was 2.26 feet lower than the January peak, and damage in the basin was light, although the peak flow for the February flood was slightly higher than any previously recorded at the gage, with the exception of the January peak.

LAKE ERIE TRIBUTARIES EAST OF CUYAHOGA RIVER

The January flood in this area generally reached unprecedented stages. There were ice jams on many streams and roads and bridges were extensively damaged by swift currents in the narrow flood plains. Total damage in the area exceeded $1½ million.

The flood on the Chagrin River was not unprecedented, but damage was extensive. Water and sewage disposal services were disrupted, and the power service at Eastlake was discontinued temporarily. About 500 persons were forced from their homes in the basin.

In the Grand River basin Mentor was without power service, the Fairport Harbor sewage disposal system ceased functioning, and many homes throughout the basin were evacuated. At the gage near Madison the Grand River reached a stage more than 2 feet higher than previously recorded in 36 years of record. In the Ashtabula River and Conneaut Creek basins flooding conditions were similar. The Geneva filtration plant was out of service temporarily. The February flood in this region was not excessive and damage was slight.

FLOOD DAMAGES

The damage caused by the flood of January 1959 in Ohio was second only to that of 1913. Because of wide variations in estimating and reporting procedures, flood damage estimates have their limitations, particularly when used in comparisons with damages for other floods. A summary of the estimated damages in January and February by basins, from the preliminary report of the Ohio Division of Water (1959), taken largely from Civil Defense sources, is tabulated in table 2.

A comparison of the total damage in the State for January 1959 and March 1913.

[The 1913 data are from Horton and Jackson (1913)]

Flood year	*Communities affected*	*Lives lost*	*Bridges destroyed*	*Buildings flooded*	*Total damage*
1913	94	367	220	33, 833	$143, 197, 492
1959	220	16	31	17, 082	100, 762, 342

If we compare the damages on the basis of the value of the dollar in 1913, the 1959 figure would amount to about one-third of the figure shown.

The 1913 flood was much greater than the 1959 in stages and discharges as well as in damages, but several factors helped reduce the loss of life and property in 1959, including more adequate communications, better organized rescue work, the effect of reservoirs, and more adequate designs of bridges and other structures.

The flood statistics cannot be expected to describe the widespread misery and inconvenience. A total of 48,715 persons were reported evacuated. There were 16 deaths. The Red Cross reported

TABLE 2.—*Summary of flood damage, January and February 1959 (adapted from data from Civil Defense Corps)*

	Flood damage	
	January	February
Ohio River basin:		
Mahoning River	$16, 377, 000	----------
Little Beaver Creek	787, 500	----------
Little Muskingum River	200, 000	----------
Muskingum River	22, 975, 000	$304, 500
Hocking River	56, 200	1, 500
Raccoon Creek	140, 000	----------
Scioto River	19, 125, 000	----------
Whiteoak Creek	33, 000	----------
Little Miami River	5, 039, 970	----------
Mill Creek	2, 940, 200	----------
Miami River	17, 605, 272	----------
Wabash River	100, 000	----------
Total for Ohio River	85, 379, 142	306, 000
Lake Erie basin:		
Grand River	1, 044, 000	----------
Cuyahoga River	----------	1, 000
Cuyahoga and Chagrin Rivers	2, 539, 000	----------
Black and Huron Rivers	1, 530, 700	----------
Sandusky River	6, 123, 500	860, 600
Portage River	1, 056, 000	1, 000
Maumee River	3, 090, 000	1, 898, 050
Total for Lake Erie	15, 383, 200	2, 760, 650
Total for state	100, 762, 342	3, 066, 650

132 houses destroyed, 2,415 with major damage and 14,535 with minor damage; 55 other buildings were destroyed, and 1,145 damaged. Of Ohio's 88 counties, 62 received flood relief funds from the American Red Cross.

MEASUREMENTS OF FLOOD DISCHARGES

The operation of a stream-gaging station consists principally of the measurement of stage and discharge and the definition of the stage-discharge relation from which discharge can be calculated for a known stage. The general method of determining discharge at gaging stations involves plotting a stage-discharge relation curve from current-meter measurements of discharge at stages varying from low to high water and applying this relation to the records of stage. Short extensions of the stage-discharge relation curve are made by logarithmic plotting, from velocity-area studies, or by use of other measurable hydraulic factors.

Except for the southeast third of the State, Ohio is glaciated and many of the stream channels are sandy or gravelly, subject to scour and fill, especially during floodflow. Frequent current-meter measurements are necessary to define discharge reliably.

During major floods it is often impossible to obtain current-meter measurements because of impassable roads, heavy floating ice or debris, destruction of structures from which flood measurements are made, and insufficient warning on streams with rapidly changing stages. During the January 1959 flood in Ohio the available technical personnel made many current-meter measurements of flood discharges, but could not measure at all gaging stations in the flood area because of personnel limitations as well as disrupted road and river conditions. During the February flood ice conditions were such that few current-meter measurements could be made, and then only with great difficulty.

Immediately following the January 1959 flood in Ohio field surveys were begun to determine peak discharges. Indirect methods employed for measurement of maximum discharge include flow over dams, flow through contracted openings, and slope-area measurements. Description of these indirect methods, as well as the usual methods of stream gaging can be found in Water-Supply Paper 888 (Corbett and others, 1943). More detailed descriptions of the indirect methods are contained in other Geological Survey publications.

More than 90 measurements by indirect methods, including 10 in cooperation with the Miami Conservancy District, were made in Ohio following the 1959 floods. About 40 of these were at current stream-gaging stations, 16 at former gaging stations, 8 at crest-stage or partial record stations, and the remainder at miscellaneous sites where knowledge of the peak discharge has important hydrologic significance. All of these results are tabulated in the next section.

SUMMARY OF FLOOD STAGES AND DISCHARGES

The results of the determinations of peak flow at stream-gaging stations and at other points on streams in Ohio are summarized in table 5. Stage and reservoir records are also included. The reference numbers in the table apply to figure 12 and are the same as shown on the station descriptions.

Because the details of datum of gages, changes in locations, and other information pertaining to the peak stages and discharges are shown in the station descriptions, footnotes have been omitted

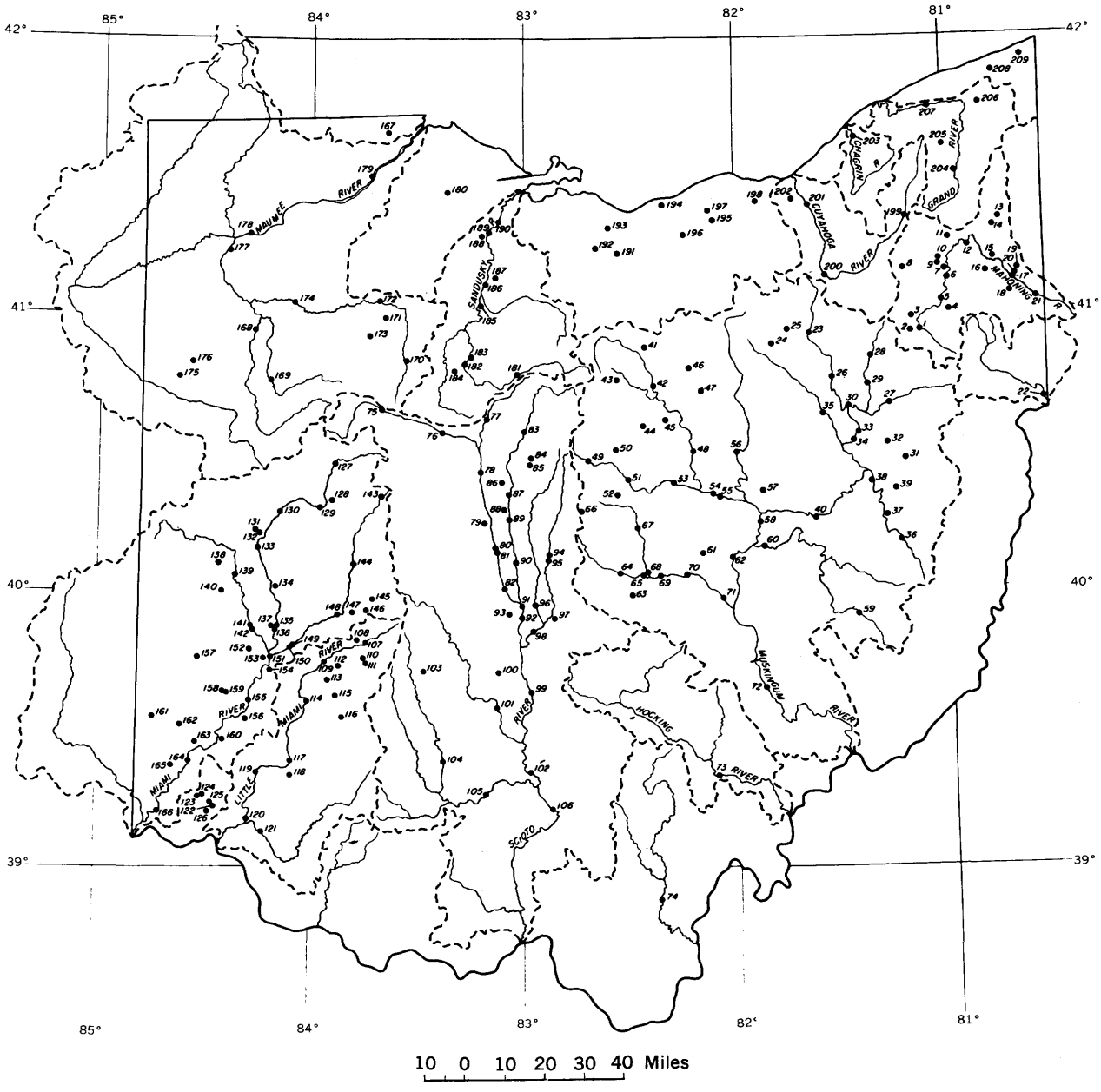

FIGURE 12.—Map of Ohio showing locations of flood measurement points during the floods of January–February 1959.

from the table, except for notes indicating significant items other than above.

The last column of the table shows the ratio of the 1959 flood to the mean annual flood (defined as the flood having a recurrence interval of 2.33 years) as determined by Cross and Webber (1959) for those gaging stations for which the mean annual flood has been determined. Reference should be made to the station description to determine the type of gage, method of measuring peak discharge and other pertinent information not available in the summary table (table 5).

Flood discharges, in cubic feet per second per square mile, plotted against the drainage areas, in square miles, are shown in figure 13. Flood discharges, in ratios to the mean annual floods, plotted against drainage areas, in square miles, are shown in figure 14.

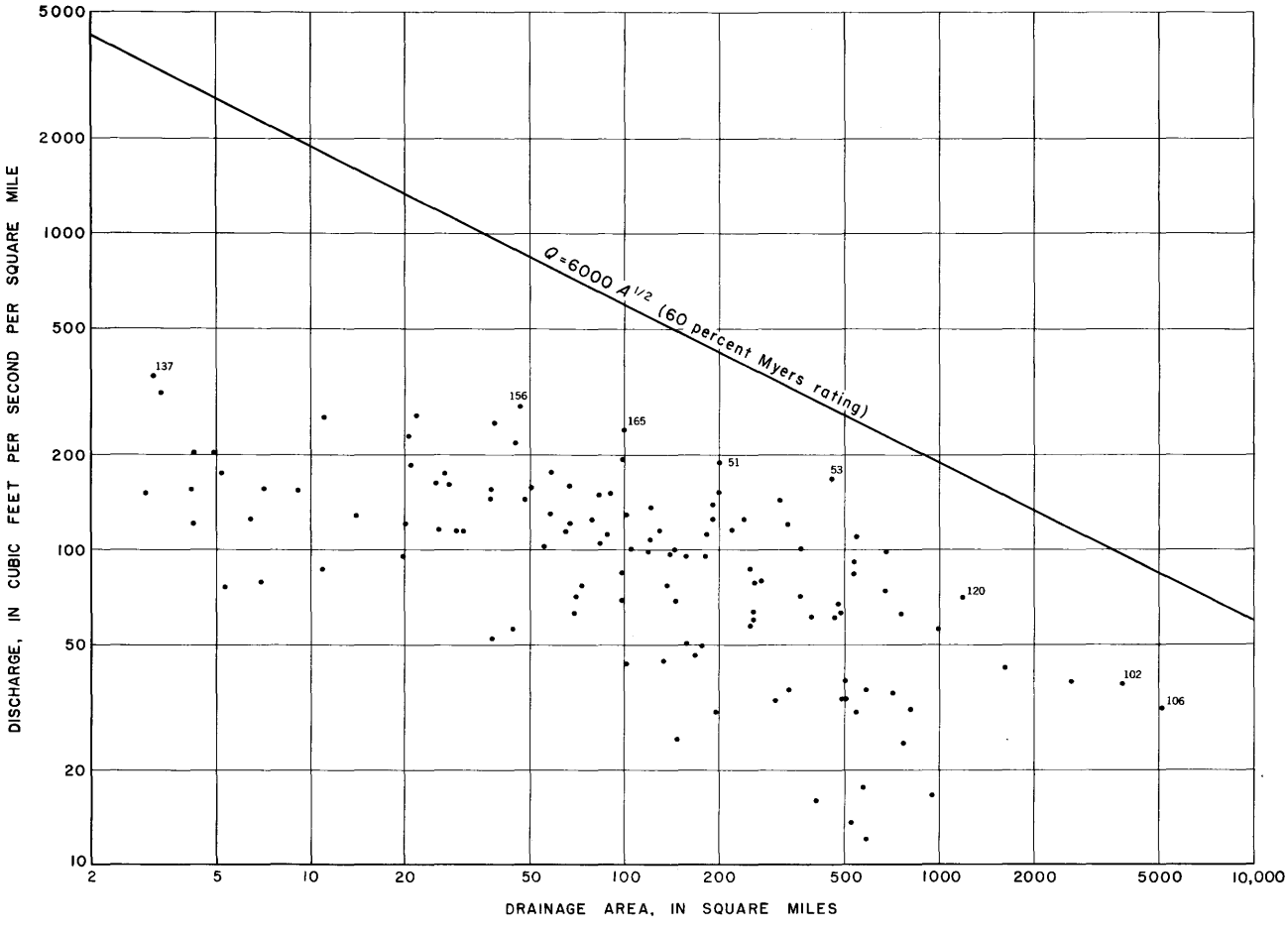

FIGURE 13.—Relation of peak discharge, in cubic feet per second, to drainage area, January floods.

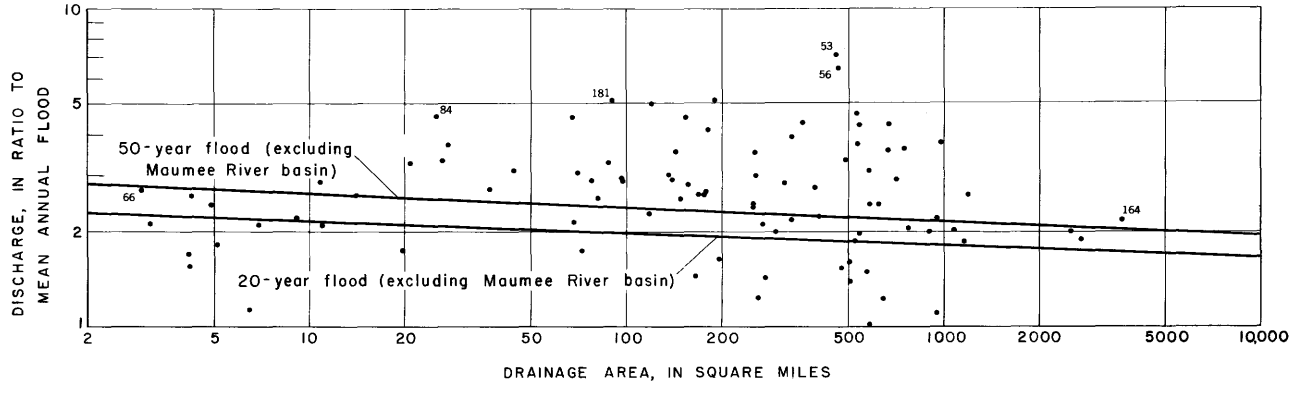

FIGURE 14.—Relation of peak discharge, in ratio to mean annual flood, to drainage area, January floods.

RAINFALL AND RUNOFF COMPARISONS

The volumes of water stored in several of the flood-control reservoirs in January were unprecedented. Converted to inches on the drainage area the runoff into a few of the reservoirs approaches the average precipitation. Table 3 lists the runoff into the reservoirs, without corrections for base flow, and the average rainfall determined by planimetering the isohyetal map. Also shown are the average depth of snow and the estimated water content. The base flow into each reservoir (the inflow that would have occurred if there had been no storm) is estimated to be of the order of 0.1 to 0.2 inch on the drainage areas. For the 2 reservoirs with the highest rainfall and runoff, Delaware and West Fork Mill Creek reservoirs, the runoff adjusted for base flow is within 0.25 inch of the total precipitation based on official point rainfall observations.

In making comparisons of rainfall and runoff from streamflow records it is the usual practice to estimate the base flow so as to exclude groundwater flow and long-delayed subsurface flow from the estimated direct runoff. This has been done for selected gage records for the January flood as shown in table 4. As the recession from the January flood extended through a period of rainfall from January 25 to 28, the precipitation for this period was included in the total available water. The differences between total precipitation and estimated direct runoff are tabulated as retention.

A total of 377 rainfall reports were used in preparing the January isohyetal map, and 278 reports were used for the February storm. The depths of snow were estimated from 94 reports, and the yields or water contents of the snow were based on 20 yield determinations. The rainfall depths determined by planimetering the isohyetal maps are believed to be reasonably accurate, though thunderstorm activity between stations may have occurred in some places. The depth-of-snow observations probably are reasonable within the limitations of observing and applying such information. However, the estimates of water content in the snow may be considerably in error as the yield determinations available, concentrated largely in the Muskingum River basin, vary widely from place to place. Some inaccuracies are to be expected in measuring the total runoff at the gaging stations; nevertheless, the measured runoff is the most accurately determined part of the hydrologic cycle. The runoff measured at a gaging station represents an integration of the flow over the entire area of origin rather than a point measurement within a large area such as in the measurement of rainfall. The estimates of base flow are consistent among themselves but are

TABLE 3.—*Runoff into reservoirs, January 1959*

[Computed from change in contents]

No.	Reservoir	Drainage area (square miles)	Average precipitation Jan. 19–21 (inches)	Average snow depth (inches)	Average water content snow (inches)	Change in contents (acre-feet)	Runoff (inches)
5	Berlin	249	3. 48	5. 6	0. 97	45, 490	3. 42
6	Milton	276	3. 50	5. 6	. 97	13, 690	. 93
15	Mosquito Creek	97. 4	2. 65	5. 0	. 75	17, 220	3. 31
16	Meander Creek	84. 9	3. 02	5. 0	. 75	9, 230	2. 04
30	Bolivar	502	3. 22	5. 8	. 62	63, 100	2. 35
31	Leesville	47. 9	2. 08	5. 8	. 87	4, 230	1. 66
32	Atwood	70. 3	2. 45	5. 8	1. 04	9, 000	2. 40
33	Dover	1, 397	3. 17	5. 4	. 61	86, 030	1. 15
35	Beach City	300	2. 84	4. 8	. 72	51, 260	3. 20
36	Piedmont	84. 0	1. 77	5. 3	. 88	8, 130	1. 81
37	Clendening	69. 5	1. 34	5. 0	. 65	4, 530	1. 22
42	Charles Mill	216	4. 21	4. 0	. 76	45, 260	3. 92
45	Pleasant Hill	199	4. 99	4. 5	. 90	30, 020	2. 83
47	Mohicanville	269	4. 05	4. 0	. 60	54, 780	3. 82
54	Mohawk	1, 501	4. 60	4. 2	. 76	175, 710	2. 20
59	Senecaville	121	2. 40	5. 5	. 66	15, 600	2. 41
60	Wills Creek	844	2. 02	4. 6	. 75	63, 800	1. 42
86	Delaware	381	4. 93	2. 9	. 35	104, 420	5. 14
94	Hoover	190	5. 41	3. 6	. 50	20, 610	2. 03
123	West Fork Mill Creek	29. 5	5. 20	1. 4	. 14	8, 190	5. 21

TABLE 4.—*Relation of precipitation to runoff, January 1959*

No.	Stream and location	Drainage area (square miles)	Average snow depth Jan. 18 (inches)	Average water content snow (inches)	Average precipitation (inches)		Total available water (inches)	Runoff (inches)	Retention (inches)
					Jan. 19–21	Jan. 25–28			
1	Mahoning River at Alliance	87. 9	5. 8	0. 96	3. 48	0. 28	4. 72	3. 75	0. 97
9	West Branch Mahoning River near Newton Falls	97. 8	6. 0	1. 04	3. 14	. 24	4. 42	3. 33	1. 09
11	Eagle Creek at Phalanx Station	97. 0	8. 0	2. 00	2. 48	. 20	4. 68	4. 17	. 51
18	Mill Creek at Youngstown	68. 4	5. 0	. 75	2. 43	. 28	3. 46	3. 01	. 45
26	Tuscarawas River at Massillon	526	4. 6	. 40	3. 57	. 21	4. 18	2. 39	1. 79
29	Nimishillen Creek at North Industry	175	6. 0	. 52	3. 57	. 24	4. 33	2. 22	2. 11
51	Kokosing River at Mount Vernon	200	4. 5	. 90	5. 00	. 25	6. 15	4. 37	1. 78
56	Killbuck Creek at Killbuck	466	3. 8	. 49	4. 16	. 26	4. 91	3. 73	1. 18
70	Licking River at Toboso	672	3. 5	. 42	4. 25	. 19	4. 86	3. 49	1. 37
78	Scioto River near Prospect	571	2. 0	. 24	4. 04	. 14	4. 42	3. 44	. 98
90	Olentangy River near Worthington	[1] 106	2. 7	. 21	5. 21	. 22	5. 64	4. 70	. 94
95	Big Walnut Creek at Central College	190	3. 6	. 50	5. 41	. 20	6. 11	5. 00	1. 11
96	Alum Creek at Columbus	190	2. 9	. 32	5. 21	. 18	5. 71	5. 22	. 49
98	Big Walnut Creek at Rees	544	3. 0	. 36	5. 18	. 19	5. 73	4. 76	. 97
100	Darby Creek at Darbyville	5. 33	1. 5	0. 15	5. 13	0. 14	5. 42	4. 80	0. 62
120	Little Miami River at Milford	1, 195	2. 0	. 22	4. 84	. 24	5. 30	4. 31	. 99
122	Mill Creek at Reading	73. 1	1. 4	. 14	5. 33	. 35	5. 82	3. 42	2. 40
130	Miami River at Sidney	545	1. 5	. 15	3. 66	. 15	3. 96	2. 66	1. 30
132	Lorami Creek at Lockington	261	1. 0	. 10	3. 44	. 10	3. 64	2. 78	. 86
136	Miami River at Taylorsville	1, 155	1. 3	. 13	3. 54	. 14	3. 81	2. 94	. 87
139	Stillwater River at Pleasant Hill	502	1. 0	. 10	3. 58	. 08	3. 76	2. 64	1. 12
142	Stillwater River at Englewood	646	1. 0	. 10	3. 76	. 09	3. 95	3. 02	. 93
144	Mad River near Urbana	157	1. 0	. 10	4. 90	. 08	5. 08	2. 57	2. 51
148	Mad River near Springfield	485	1. 3	. 13	5. 20	. 15	5. 48	3. 08	2. 40
150	Mad River near Dayton	632	1. 3	. 13	5. 36	. 16	5. 65	2. 95	2. 70
151	Miami River at Dayton	2, 513	1. 2	. 12	4. 09	. 14	4. 35	2. 90	1. 45
155	Miami River at Miamisburg	2, 718	1. 2	. 12	4. 17	. 14	4. 43	3. 11	1. 32
159	Twin Creek near Germantown	275	1. 0	. 10	4. 67	. 20	4. 97	3. 86	1. 11
164	Miami River at Hamilton	3, 639	1. 2	0. 12	4. 42	0. 16	4. 70	3. 09	1. 61
172	Blanchard River near Findlay	343	1. 0	. 10	2. 92	. 17	3. 19	3. 08	. 11
178	Maumee River near Defiance	5, 530	1. 0	. 10	2. 43	. 24	2. 77	. 98	1. 79
185	Sandusky River near Mexico	776	2. 0	. 24	3. 71	. 19	4. 14	3. 18	. 96
193	Huron River at Milan	363	2. 8	. 34	3. 39	. 26	3. 99	3. 25	. 74
207	Grand River near Madison	587	6. 5	1. 25	2. 36	. 22	3. 83	3. 60	. 23
209	Conneaut Creek at Amboy	178	9. 0	2. 00	1. 86	. 20	4. 06	3. 58	. 48

[1] Effective area.

matters of opinion, subject to speculation and interpretation. As the errors involved are magnified by subtraction, the estimated retentions may be rather inaccurate.

The rainfall estimates have been plotted against the runoff for the January flood and are shown on figure 15. Except for a few areas of known high permeability, such as the basins of Nimishillen Creek, Mill Creek and the Mad River, the points generally scatter about the 80 percent yield line shown on the figure. These results may be compared with the rainfall-runoff data for the 1913 flood (Houck, 1921 and Morgan, 1951). The runoff for the Miami River at Dayton was 91 percent of the rainfall in 1913, and was about 80 percent of the rainfall generally throughout the Miami River basin. The 1913 storm lasted several days, and the retention figures are consistent with the 1959 data. The retention above Hamilton in 1913 was 1.36 inches, compared with 1.45 inches in 1959.

The rainfall-runoff data for three gaging stations for the February flood are inconsistent, and show more runoff than rainfall for one station. Blanchard River near Findlay, Maumee River near Defiance, and Sandusky River near Mexico, show the average precipitation February 9–11 to be 2.62, 2.00, and 2.61 inches, the runoff to be 2.59, 2.66, and 2.01 inches, and the retention to be 0.03, −0.66, and 0.60 inch, respectively. Base flows were high following the January flood, and although the snow melted and was not recorded, some snow water ran off during the flood. Because of these complications and the smaller rainfall and runoff, the studies were not made for more than the three stations.

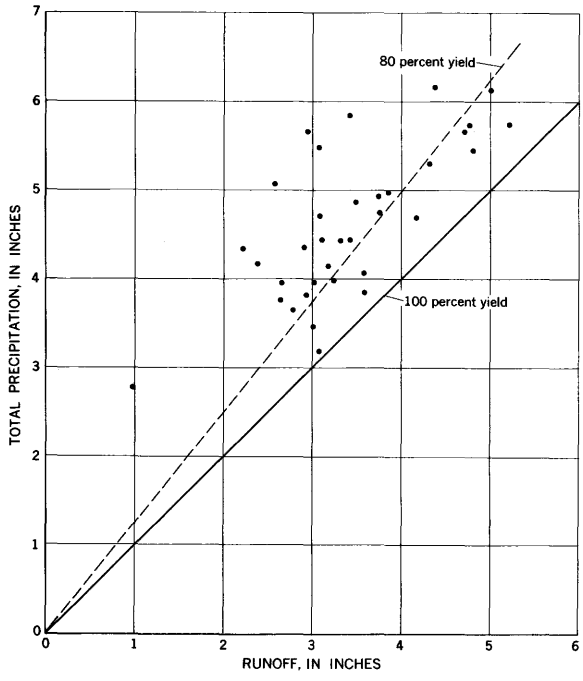

FIGURE 15.—Relation of rainfall to runoff, January floods.

The precipitation data and isohyetal determinations pertinent to the foregoing analyses were made available through the assistance and courtesy of Mr. Paul Kaser, hydrologist, Ohio Division of Water.

FREQUENCY OF STORMS AND PEAK DISCHARGES

The previous maximum 24-hour rainfall intensities were exceeded by the January storm at Dayton and Columbus. A study of frequency curves computed by the U.S. Weather Bureau (1955) indicates that the frequency of the 12-hour, 18-hour and 24-hour intensities were slightly beyond the 100-year line. The maximum point rainfall recorded for 24 hours is slightly higher than for these 2 stations. Therefore it seems reasonable to conclude that the average frequency of the flood-producing rainfall in January 1959 was slightly less than once in 100 years.

From the standpoint of area-intensity-frequency, rather than point rainfall-frequency, the situation is less clear. Most of the available rainfall records in Ohio are shorter than 100 years. The storms studied by the Corps of Engineers in compiling depth-area-duration data (Corps of Engineers, Department of the Army, 1945) included several storms centered in the Ohio Valley that exceeded the January 1959 storm in area and intensity. However, only the 1913 storm was centered in Ohio. The isohyetal areas listed in table 1 for the 1959 storm approximate the 24-hour intensity areas. From the typical mass rainfall graphs of figure 5, by ratios to the 24-hour intensities, applied to the areas of table 1 it seems that the area-intensities for the 1913 storm were far above the 1959 storm for durations of 6, 12, 18, and 24 hours. Several other storms, centered outside Ohio but in the Ohio valley region, far exceed the area-intensity of the January 1959 storm. However, the Ohio valley is large, so that an approximation of the probable frequency of the area-intensities of the magnitude of the January storm would be beyond 100 years. Such an estimation of the frequency of the storm is about as precise as can be made from available records.

The frequency of a flood discharge may be estimated fairly reliably if the flood is within the range of observed data. Discharge-frequency diagrams have been prepared for Ohio streams (Cross and Webber, 1959) and have been extended to 50-year frequencies. Except in the fringes of the flood areas where the discharges are within the diagrams, these diagrams reveal that the January 1959 flood discharges are much greater than the 50-year floods. The frequency of such rare floods cannot be estimated with reliability because of the sparse sample included in the short records.

Methods other than frequency diagrams are available for studying the relative magnitudes of floods. One of these is the Myers formula, $Q = 100P\sqrt{A}$, in which Q is the flood discharge, in cubic feet per second; P is the Myers rating, in percent; and A is the drainage area, in square miles. The 60 percent Myers rating is shown on the diagram of figure 13, and may be considered as the envelope or upper limit of flood experience in Ohio. As the flood potentialities of areas differ widely, a 40-percent Myers rating flood on one stream might have the same frequency as a 70-percent Myers rating flood on another.

Another method of comparing the intensities of floods is in terms of ratios to the mean annual flood. Figure 14 is a diagram of ratios to the mean annual flood for those stations for which the mean annual flood has been estimated. The 20-

year and 50-year frequency lines shown are for Ohio streams, excluding the Maumee River basin. This diagram suggests that many of the peak flows are rare floods, with frequencies beyond 100 years. Considering that flood ratios on the larger areas should be adjusted for storage effect, the diagram indicates that the area and intensity of the rain and antecedent ground conditions were such as to cause floods of magnitudes beyond 50-year frequencies on areas ranging from 10 to more than 6,000 square miles, with the greatest magnitudes centered around 500 square miles.

Considered as a single event, the January 1959 flood was second only to the 1913 flood since the area was settled by the white man. At some specific locations greater floods have occurred. Based upon poor frequency definition, it may be said that the January 1959 flood was of a 100-year or greater recurrence interval at many gaging stations. The finality of this deduction is uncertain, but is the best that can be made with available records, most of which extend back less than a half century. Furthermore this great flood is a reminder of the danger of excess rainfall and runoff—the threat which must be recognized, not minimized, by frequency studies.

COMPARISON WITH PREVIOUS FLOODS

Stream gaging on a systematic basis did not begin in Ohio until about 1921. However, table 5 lists 16 records that cover fairly completely the period extending back to 1913. Records of stages kept by the Weather Bureau include the same period, but give little information on floods before 1913.

Records of stage on the Ohio River are more complete, and the stages of all high floods at Cincinnati since that city was first settled are listed in Division of Water Bulletin 32 (Cross and Webber, 1959). The six highest, in order of magnitude, are those of 1937, 1773, 1884, 1945, 1913 and 1883. These floods were caused by large-area storms of several days or weeks duration, and except for the 1913 flood, did not cause unusual floods on the small Ohio River tributaries. The 1937 flood, for example, was a major catastrophe on the Ohio River, but was not a major flood except on the downstream reaches of the tributaries such as the Muskingum, Scioto, and Miami Rivers.

Unofficial records of flood stages of greater length are available for many of the Ohio River tributaries in Ohio, and are summarized in Water-Supply Paper 838 (Grover, 1938). These records indicate that the 1913 flood generally was the highest since the settlement of Ohio on the Ohio River tributaries from the Mahoning River to the Miami River, with the exception of the Hocking River. The storm of March 1913 was unusual not only in its high total rainfall of about seven days duration, causing a major flood on the Ohio River, but also for the high intensities for short periods of time, from 6 to 24 hours, causing extreme floods on areas ranging from 100 to 7,500 square miles.

On the Mahoning River at Youngstown, the 1937 flood exceeded the 1959 flood, but both were more than 6 feet below the 1913 peak stage. Adjusting for reservoir storage effect, the 1959 flood would be at about the same stage as the flood of 1904, the highest flood known before 1913.

The 1959 flood on the lower Muskingum River was not outstanding, being exceeded by the peak flows of 1913, 1935, 1937, 1945 and 1952. However, several of the western tributaries of the Muskingum River exceeded the 1913 flood in January 1959, although the 1913 flood magnitudes in this general area were not as outstanding as elewhere in the Muskingum and Scioto River basins. On the Kokosing River at Millwood the January peak flow was nearly twice that of 1913, and the Licking River at Toboso was over a foot higher in 1959 than in 1913. The magnitude of the 1959 flood on the Kokosing River may best be considered from the standpoint of its ratio to the mean annual flood, which is 7.16, higher than the 7.04 ratio for the 1913 flood on the Miami River at Hamilton. The latter ratio was the highest previously recorded for streams in Ohio with drainage area over 10 square miles. In Mount Vernon, local testimony indicates the order of magnitude of floods as January 1959, 1913, 1898 and 1937.

On several of the Muskingum River tributaries the cloudburst flood of August 1935 is the maximum of record (Youngquist and Langbein, 1941). This flood was particularly outstanding on Killbuck Creek at Killbuck. The January 1959 peak stage was within two-hundredths of a foot of the 1935 stage.

On the Scioto River at Columbus the 1898 flood of 75,000 cfs is the greatest flood of record before 1913. Adjusted for reservoir storage, the 1959 flood would have exceeded the 1898 flood. The records of stage at Circleville, from 1833 to date,

tend to confirm the conclusion that the 1959 flood, without storage effect, would be the second worst in history. At Chillicothe the 1959 flood was second only to the 1913 flood for the period beginning in 1908. Below Chillicothe the 1959 flood was not as outstanding because of the minor flood on Paint Creek. The peak stage in January 1959 on Big Walnut Creek at Rees exceeded the 1913 flood despite the reservoir effect of Hoover Dam, but Rees is in an area where the 1913 flood was not as outstanding as elsewhere.

The January 1959 peak stages on the Little Miami River exceeded those of 1913 in a reach extending from Fort Ancient to Morrow, according to local residents.

Records of flood stages on the Miami River at Dayton are available for the entire period since the arrival of the white man. The second highest stage, that of 1866, is 7.7 ft lower than that of the 1913 flood, and about 9.5 ft higher than that of January 1959. As the storage effect of the four retarding reservoirs undoubtedly lowered the stage by several feet, the 1959 flood without storage might have ranked close to that of 1866.

In the Maumee River basin the 1959 floods were not outstanding on the main river, but the February flood was the highest since 1913 on the Auglaize River and its tributaries. In the Sandusky River basin the January flood was generally as high or higher than the 1937 flood, slightly higher than the 1950 flood, and 3 or more feet below the record 1913 level, but during the 1959 flood the situation was complicated by ice jams.

On the Cuyahoga River the January flood was the highest since 1913. The Chagrin River at Willoughby exceeded the 1913 peak, but was lower than the 1948 flood. East of the Chagrin River the January flood exceeded the highest stages previously recorded in the short periods of record.

In summary, the 1959 floods were generally second only to the 1913 flood throughout a large part of Ohio. At several points the 1959 peaks exceeded those of 1913. The Kokosing River flood, which caused tremendous damage at Mount Vernon, exceeded all records in Ohio (on streams with over 10 square miles drainage area) in terms of ratio to mean annual flood.

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RECORDS OF STAGES AND DISCHARGES

The data presented on the following pages include a description for selected gaging stations in the storm area. Tables of daily mean discharges are included for December 1958, and January and February 1959. Detailed discharge hydrographs of the flood period are shown for some of the gaging stations; the period shown is January 20 to February 18, 1959, thereby including both the January and February peaks.

The description for each gaging station gives the location, size of drainage area above the gage, method of obtaining gage-height record during the flood period, datum of gage, a brief statement of the definition of the stage-discharge relation, maximum stage and discharge during the present floods, previous maximum of record, and other pertinent information.

Station descriptions and storage data are included for 23 reservoir stations. Month-end stages and contents are shown for November and December 1958, January and February 1959, together with stages and contents just before the flood and for the maximum contents. Maximum contents for other reservoirs are given in a summary table.

The tables of daily mean discharges for selected stations are presented for December 1958 through February 1959 to show the relation of the flood discharges to the preceding and the following periods. The tables also show the monthly mean discharge and the volume of runoff in inches, adjusted for storage for those stations downstream from reservoirs.

The stations are numbered and arranged in downstream order from headwater to mouth, with stations on tributaries inserted in corresponding order, and following the order in which the tributaries enter the main stream. Stations on streams tributary to the Ohio River are shown first, followed by streams tributary to Lake Erie. Records for streams on the fringe of the flooded area are included as well as for streams within the areas of intense flooding. Locations of the gaging stations are shown by number on figure 12.

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1. Mahoning River at Alliance, Ohio

Location. --Lat 40°55'55", long 81°05'45", on right bank 15 ft upstream from Webb Avenue Bridge in Alliance, Stark County, 0.2 mile upstream from waterworks dam, and 4 miles upstream from Beech Creek.
Drainage area. --87.9 sq mi.
Gage-height record. --Water-stage recorder graph. Datum of gage is 1,037.3 ft above mean sea level, adjustment of 1912.
Discharge record. --Stage-discharge relation defined by current-meter measurements below 3,300 cfs and extended above on basis of computations of flow over dam.
Maxima. --January-February 1959: Discharge, 9,740 cfs 10:30 p.m. Jan. 21 (gage height, 9.11 ft).
1941 to December 1958: Discharge, 7,000 cfs May 27, 1946 (gage height, 7.90 ft).

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	17	74	117	11	30	28	1,420	21	33	3,680	62
2	19	375	86	12	26	26	345	22	30	4,360	60
3	23	261	65	13	26	26	218	23	30	553	100
4	86	121	148	14	21	23	256	24	38	206	340
5	165	77	99	15	21	62	498	25	46	121	152
6	86	110	60	16	21	125	314	26	38	96	133
7	65	86	49	17	21	89	187	27	30	83	169
8	49	51	46	18	21	113	165	28	30	60	156
9	38	38	65	19	23	106	113	29	33	57	------
10	33	30	2,000	20	26	60	74	30	60	297	------
								31	60	410	------
Monthly mean discharge, in cubic feet per second									40.2	381	268
Runoff, in inches									.53	4.99	3.18

5. Berlin Reservoir near Berlin Center, Ohio

Location. --Lat 41°02'45", long 81°00'10", at dam on Mahoning River, 3¼ miles northwest of Berlin Center, Mahoning County.
Drainage area. --249 sq mi.
Remarks. --Records furnished by Corps of Engineers.

Elevation, in feet, and contents, in acre-feet

Date	Time	Elevation	Contents	Date	Time	Elevation	Contents
Nov. 30, 1958	12 p.m.	1,007.24	19,520	Jan. 31, 1959	12 p.m.	1,018.43	39,670
Dec. 31	12 p.m.	1,003.53	15,330	Feb. 9	4 p.m.	1,013.19	28,630
Jan. 20, 1959	12 p.m.	1,004.68	16,520	12	9 a.m.	1,023.43	53,930
24	9 a.m.	1,025.70	62,010	28	12 p.m.	1,016.21	34,590

6. Milton Reservoir at Pricetown, Ohio

Location. --Lat 41°07'40", long 80°58'35", at dam on Mahoning River, 0.8 mile southwest of Pricetown, Mahoning County.
Drainage area. --276 sq mi.
Remarks. --Capacity table computed from base data furnished by city of Youngstown, Division of Water.

Elevation, in feet, and contents, in acre-feet

Date	Time	Elevation	Contents	Date	Time	Elevation	Contents
Nov. 30, 1958	12 p.m.	941.92	14,500	Feb. 9, 1959	12 m.	947.95	23,440
Dec. 31	12 p.m.	941.83	14,450	13	1:30 p.m.	951.13	29,420
Jan. 20, 1959	3 p.m.	943.68	16,830	16	9 a.m.	951.16	29,480
27		951.67	30,520	28	12 p.m.	948.38	24,240
31	12 p.m.	950.60	28,370				

9. West Branch Mahoning River near Newton Falls, Ohio

Location. --Lat 41°10'18", long 81°01'18", on right bank 250 ft downstream from bridge on Ravenna Road in Portage County, 2½ miles southwest of Newton Falls, Trumbull County, 6 miles upstream from mouth, and 7 miles downstream from Silver Creek.
Drainage area. --97.8 sq mi.
Gage-height record. --Water-stage recorder graph except for Dec. 11-16, Jan. 6-12, 22-25, and Feb. 1-3, for which periods graph was reconstructed on basis of high-water mark in well, and graph before and after these periods. Datum of gage is 912.2 ft above mean sea level (Corps of Engineers bench mark).
Discharge record. --Stage-discharge relation defined by current-meter measurements below 5,280 cfs. Backwater from ice Dec. 6-10, Dec. 17 to Jan. 1, Jan. 13-14, 19-21, 26-29, Feb. 5-9, 19-21.
Maxima. --January-February 1959: Discharge, 8,340 cfs 2:30 a.m. Jan. 22 (gage height, 13.60 ft).
1926 to December 1958: Discharge, 6,090 cfs Feb. 26, 1929 (gage height, 11.8 ft from graph based on gage readings).

9. West Branch Mahoning River near Newton Falls, Ohio--Continued

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	47	50	150	11	35	30	2,650	21	32	2,550	70
2	50	648	71	12	33	30	355	22	27	5,190	57
3	54	344	52	13	31	29	240	23	28	839	189
4	154	154	96	14	30	29	240	24	31	290	648
5	299	84	78	15	28	63	892	25	35	125	226
6	125	70	45	16	27	256	319	26	31	80	154
7	75	50	33	17	27	143	215	27	27	60	195
8	55	40	30	18	27	106	191	28	27	45	195
9	45	36	40	19	30	75	108	29	27	38	------
10	38	32	2,590	20	32	50	85	30	30	502	------
								31	35	387	------
Monthly mean discharge, in cubic feet per second									50.7	401	365
Runoff, in inches									.60	4.73	3.88

14. Mosquito Creek Reservoir near Cortland, Ohio

Location.--Lat 41°18'00", long 80°45'25", at dam on Mosquito Creek, 3 miles southwest of Cortland, Trumbull County.
Drainage area.--97.4 sq mi.
Remarks.--Records furnished by Corps of Engineers.

Elevation, in feet, and contents, in acre-feet

Date	Time	Elevation	Contents	Date	Time	Elevation	Contents
Nov. 30, 1958	12 p.m.	896.70	49,990	Jan. 31, 1959	12 p.m.	900.27	73,760
Dec. 31	12 p.m.	897.21	53,070	Feb. 9	12 m.	899.77	70,120
Jan. 20	6 p.m.	898.02	58,180	16	2 a.m.	901.47	82,920
26	6 a.m.	900.49	75,400	28	12 p.m.	900.13	72,730

16. Meander Creek Reservoir at Mineral Ridge, Ohio

Location.--Lat 41°09'10", long 80°46'50", at dam on Meander Creek, 0.8 mile northwest of Mineral Ridge, Trumbull County.
Drainage area.--84.9 sq mi.
Remarks.--Capacity table computed from base data furnished by Mahoning Valley Sanitary District.

Elevation, in feet, and contents, in acre-feet

Date	Time	Elevation	Contents	Date	Time	Elevation	Contents
Nov. 30, 1958	12 p.m.	904.22	30,900	Jan. 31, 1959	12 p.m.	905.75	33,930
Dec. 31	12 p.m.	904.33	31,110	Feb. 9	12 m.	905.10	32,610
Jan. 20, 1959	12 p.m.	905.08	32,570	10	8 p.m.	908.13	39,130
21	12 p.m.	909.25	41,800	28	12 p.m.	905.54	33,500

17. Mahoning River at Youngstown, Ohio

Location.--Lat 41°06'41", long 80°40'25", on left bank 400 ft upstream from Bridge Street Bridge in Youngstown, Mahoning County, and three quarters of a mile upstream from Mill Creek.
Drainage area.--899 sq mi.
Gage-height record.--Water-stage recorder graph except for 7 a.m. Jan. 21 to 5 p.m. Jan. 22 and Jan. 24 to Feb. 4, for which periods graph was reconstructed on basis of gage readings. Datum of gage is 826.53 ft above mean sea level, adjustment of 1912 (levels by Mahoning Valley Sanitary District).
Discharge record.--Stage-discharge relation defined by current-meter measurements. Backwater from Mill Creek at times.
Maxima.--January-February 1959: Discharge, 16,900 cfs 4-8 p.m. Jan. 22; maximum gage height, 18.62 ft 7 a.m. Jan. 22.
1921-28: Discharge, 14,000 cfs Dec. 14, 1927 (gage height, 12.7 ft).
1929-42: Discharge, 17,600 cfs Jan. 25, 1937 (gage height, 14.92 ft).
1943 to December 1958: Discharge, 13,400 cfs Jan. 27, 1952 (gage height, 13.62 ft).
Maximum stage known, 26.5 ft Mar. 26, 1913 (discharge, 42,500 cfs, estimated by Corps of Engineers).
Remarks.--Flood flow regulated by Milton Reservoir beginning in 1916, Meander Creek Reservoir beginning in 1929, Berlin Reservoir beginning in 1942, Mosquito Creek Reservoir beginning in 1943, and reservoir on Squaw Creek.

17. Mahoning River at Youngstown, Ohio--Continued

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	431	536	2,980	11	410	350	13,600	21	362	7,680	3,850
2	424	1,430	2,470	12	398	350	10,600	22	362	16,200	3,300
3	438	1,940	2,470	13	380	322	3,370	23	350	15,600	2,950
4	684	1,370	2,300	14	356	295	3,500	24	380	9,140	3,460
5	1,320	783	2,120	15	356	424	3,610	25	404	2,130	2,840
6	1,280	550	1,960	16	344	590	4,280	26	404	2,090	1,860
7	729	473	1,400	17	350	747	4,400	27	368	2,590	1,670
8	566	417	1,070	18	350	693	4,460	28	350	3,040	1,820
9	473	392	1,100	19	356	558	4,310	29	356	3,080	--------
10	424	356	8,550	20	368	451	3,960	30	404	3,360	--------
								31	445	3,670	--------
Monthly mean discharge, in cubic feet per second									472	2,632	3,724
Mean discharge, adjusted for storage, cubic feet per second									456	3,637	3,532
Adjusted runoff, in inches									.58	4.67	4.09

26. Tuscarawas River at Massillon, Ohio

Location.--Lat 40°46'17", long 81°31'25", on left bank at sewage treatment works, 1½ miles south of Massillon, Stark County, and 3 miles downstream from Newman Creek.
Drainage area.--526 sq mi.
Gage-height record.--Water-stage recorder graph except for periods 2 p.m. Jan. 21 to 2 p.m. Feb. 18 and 3 a.m. Feb. 23 to 10 a.m. Feb. 25, for which periods graph was reconstructed on basis of gage readings made once daily or oftener. Datum of gage is 916.00 ft above mean sea level, adjustment of 1912.
Discharge record.--Stage-discharge relation defined by current-meter measurements.
Maxima.--January-February 1959: Discharge, 7,220 cfs 9:30 a.m. Jan. 22 (gage height, 13.46 ft).
1937 to December 1958: Discharge, 6,940 cfs Mar. 5, 1940 (gage height, 11.39 ft, from graph based on gage readings).
Remarks.--Flow slightly regulated at headwaters at Portage Lakes (3,000 acre-ft), and by Nimisilla Reservoir (6,500 acre-ft) since 1939; peak discharges not materially affected.

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	218	310	1,080	11	209	190	4,880	21	168	3,810	574
2	222	1,090	612	12	205	188	4,900	22	166	7,130	499
3	231	880	514	13	192	194	4,290	23	178	6,660	1,190
4	282	535	644	14	170	200	3,290	24	198	5,730	1,580
5	538	331	566	15	170	328	3,110	25	200	4,660	1,300
6	409	315	481	16	170	535	3,050	26	188	3,220	902
7	273	280	427	17	176	345	2,570	27	190	1,890	874
8	244	256	364	18	174	313	1,890	28	182	1,190	918
9	238	238	412	19	178	268	1,220	29	186	882	--------
10	215	215	3,490	20	182	263	790	30	215	1,320	--------
								31	224	1,640	--------
Monthly mean discharge, in cubic feet per second									219	1,465	1,658
Runoff, in inches									.48	3.20	3.28

29. Nimishillen Creek at North Industry, Ohio

Location.--Lat 40°44'01", long 81°21'08", on left bank just downstream from railroad bridge, 1 mile southeast of North Industry, Stark County, and 3 miles downstream from Sherrick Run.
Drainage area.--175 sq mi.
Gage-height record.--Water-stage recorder graph. Datum of gage is 970.77 ft above mean sea level, adjustment of 1912.
Discharge record.--Stage-discharge relation defined by current-meter measurements below 6,400 cfs and extended above on basis of slope-area measurement of 1959 peak flow.
Maxima.--January-February 1959: Discharge, 8,620 cfs 10 p.m. Jan. 21 (gage height, 11.29 ft).
1921 to December 1958: Discharge, 6,660 cfs Feb. 26, 1929 (gage height, 9.9 ft).

29. Nimishillen Creek at North Industry, Ohio--Continued

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	104	336	235	11	93	92	1,830	21	92	4,300	208
2	108	560	187	12	97	93	590	22	92	5,390	217
3	119	286	184	13	88	99	508	23	108	928	444
4	235	202	324	14	79	112	556	24	115	488	516
5	276	127	211	15	84	325	870	25	99	349	314
6	160	129	169	16	86	250	460	26	92	293	296
7	108	119	145	17	88	160	405	27	93	259	321
8	112	117	145	18	88	145	377	28	90	217	310
9	108	108	289	19	104	135	293	29	117	205	-----
10	99	95	3,100	20	97	168	235	30	166	712	-----
								31	140	402	-----
Monthly mean discharge, in cubic feet per second									114	555	491
Runoff, in inches									.75	3.66	2.93

30. Bolivar Reservoir at Bolivar, Ohio

Location.--Lat 40°39'05", long 81°25'55", at dam on Sandy Creek, 1.1 mile east of Bolivar, Tuscarawas County.
Drainage area.--502 sq mi.
Remarks.--Gage-height record and capacity curve furnished by Corps of Engineers.

Elevation, in feet, and contents, in acre-feet

Date	Time	Elevation	Contents	Date	Time	Elevation	Contents
Nov. 30, 1958	12 p.m.	897.33	245	Jan. 31, 1959	12 p.m.	941.84	56,440
Dec. 31	12 p.m.	898.13	313	Feb. 9	12 p.m.	928.81	24,660
Jan. 20, 1959	6 p.m.	898.35	336	12	1:30 p.m.	936.13	40,440
26	9-10 p.m.	944.01	63,440	28	12 p.m.	901.79	841

31. Leesville Reservoir near Leesville, Ohio

Location.--Lat 40°28'10", long 81°11'45", at dam on McGuire Creek, 1.4 miles northwest of Leesville, Carroll County.
Drainage area.--47.9 sq mi.
Remarks.--Gage-height record and capacity curve furnished by Corps of Engineers.

Elevation, in feet, and contents, in acre-feet

Date	Time	Elevation	Contents	Date	Time	Elevation	Contents
Nov. 30, 1958	12 p.m.	962.65	19,150	Jan. 31, 1959	12 p.m.	966.48	23,180
Dec. 31	12 p.m.	962.65	19,150	Feb. 9	10 p.m.	963.93	20,430
Jan. 20, 1959	12 p.m.	962.88	19,380	13	12 m.	966.49	23,190
24	7:30 a.m.	966.87	23,610	28	12 p.m.	963.04	19,540

32. Atwood Reservoir near New Cumberland, Ohio

Location.--Lat 40°31'35", long 81°17'15", at dam on Indian Fork, 1.5 miles southeast of New Cumberland, Tuscarawas County.
Drainage area.--70.3 sq mi.
Remarks.--Gage-height record and capacity curve furnished by Corps of Engineers.

Elevation, in feet, and contents, in acre-feet

Date	Time	Elevation	Contents	Date	Time	Elevation	Contents
Nov. 30, 1958	12 p.m.	927.61	23,020	Jan. 31, 1959	12 p.m.	932.93	32,170
Dec. 31	12 p.m.	927.66	23,090	Feb. 9	10 p.m.	929.57	26,110
Jan. 20, 1959	12 p.m.	928.00	23,600	13	10:30 p.m.	932.62	31,580
26	7:30 a.m.-1:30 p.m.	933.16	32,600	28	12 p.m.	928.25	24,000

33. Dover Reservoir near Dover, Ohio

Location.--Lat 40°53'30", long 81°24'45", at dam on Tuscarawas River, 4.2 miles northeast of Dover, Tuscarawas County.
Drainage area.--1,397 sq mi.
Remarks.--Gage-height record and capacity curve furnished by Corps of Engineers.

33. Dover Reservoir near Dover, Ohio--Continued

Elevation, in feet, and contents, in acre-feet

Date	Time	Elevation	Contents	Date	Time	Elevation	Contents
Nov. 30, 1958	12 p.m.	865.60	3.0	Jan. 31, 1959	12 m	896.74	57,250
Dec. 31	12 p.m.	866.55	17	Feb. 9	12 p.m.	882.29	8,490
Jan. 21, 1959	2 a.m.	868.63	93	17	5 p.m.	896.37	55,320
25	7:30 p.m.	901.65	86,120	28	12 p.m.	871.25	338

35. Beach City Reservoir near Beach City, Ohio

Location.--Lat 40°38'10", long 81°33'30", at dam on Sugar Creek, 1.6 miles southeast of Beach City, Stark County.
Drainage area.--300 sq mi.
Remarks.--Gage-height record and capacity curve furnished by Corps of Engineers.

Elevation, in feet, and contents, in acre-feet

Date	Time	Elevation	Contents	Date	Time	Elevation	Contents
Nov. 30, 1958	12 p.m.	948.65	2,000	Jan. 31, 1959	12 p.m.	964.62	22,590
Dec. 31	12 p.m.	948.93	2,130	Feb. 9	10 p.m.	949.50	2,430
Jan. 20, 1959	12 m.	949.18	2,260	12	7:30 a.m.	962.16	17,140
23	6:15-7:30 a.m.	973.24	53,520	28	12 p.m.	950.01	2,710

36. Piedmont Reservoir at Piedmont, Ohio

Location.--Lat 40°11'25", long 81°12'45", at dam on Stillwater Creek, 0.4 mile west of Piedmont, Harrison County.
Drainage area.--84.0 sq mi.
Remarks.--Gage-height record and capacity curve furnished by Corps of Engineers.

Elevation, in feet, and contents, in acre-feet

Date	Time	Elevation	Contents	Date	Time	Elevation	Contents
Nov. 30, 1958	12 p.m.	912.83	33,180	Jan. 31, 1959	12 p.m.	914.76	37,620
Dec. 31	12 p.m.	912.87	33,280	Feb. 9	12 m.	913.22	34,080
Jan. 19, 1959	12 p.m.	913.18	33,990	13	7:30-8:30 p.m.	915.94	40,580
24	4:30-10:30 p.m.	916.56	42,120	28	12 p.m.	913.13	33,870

37. Clendening Reservoir at Tippecanoe, Ohio

Location.--Lat 40°16'05", long 81°16'35", at dam on Brushy Fork, 0.6 mile east of Tippecanoe, Harrison County.
Drainage area.--69.5 sq mi.
Remarks.--Gage-height record and capacity curve furnished by Corps of Engineers.

Elevation, in feet, and contents, in acre-feet

Date	Time	Elevation	Contents	Date	Time	Elevation	Contents
Nov. 30, 1958	12 p.m.	897.60	25,820	Jan. 31, 1959	12 p.m.	898.05	26,600
Dec. 31	12 p.m.	897.65	25,900	Feb. 9	10 p.m.	898.12	26,730
Jan. 20, 1959	12 m.	898.06	26,610	15	6 a.m.	900.64	31,520
24	1:30 a.m.-9:30 p.m.	900.44	31,140	28	12 p.m.	898.11	26,710

39. Tappan Reservoir at Tappan, Ohio

Location.--Lat 40°21'35", long 81°13'35", at dam on Little Stillwater Creek, 0.9 mile west of Tappan, Harrison County.
Drainage area.--71.0 sq mi.
Remarks.--Gage-height record and capacity curve furnished by Corps of Engineers.

Elevation, in feet, and contents, in acre-feet

Date	Time	Elevation	Contents	Date	Time	Elevation	Contents
Nov. 30, 1958	12 p.m.	893.00	21,800	Feb. 9, 1959	12 m.	899.26	35,020
Dec. 31	12 p.m.	893.27	22,300	15	9 a.m.	901.10	39,460
Jan. 20, 1959	9 p.m.	895.11	25,930	28	12 p.m.	899.30	35,120
31	12 p.m.	898.56	33,390				

42. Charles Mill Reservoir near Mifflin, Ohio

Location.--Lat 40°44'20", long 82°21'40", at dam on Black Fork, 2.5 miles south of Mifflin, Ashland County.
Drainage area.--216 sq mi.
Remarks.--Gage-height record and capacity curve furnished by Corps of Engineers.

42. Charles Mill Reservoir near Mifflin, Ohio--Continued

Elevation, in feet, and contents, in acre-feet

Date	Time	Elevation	Contents	Date	Time	Elevation	Contents
Nov. 30, 1958	12 p.m.	997.70	8,380	Jan. 31, 1959	12 p.m.	1,012.34	48,560
Dec. 31	12 p.m.	997.38	7,930	Feb. 9	9 p.m.	1,008.78	34,730
Jan. 20, 1959	12 p.m.	997.80	8,520	15	10 p.m.	1,012.82	50,630
25	10 a.m.-7:30 p.m.	1,013.53	53,780	28	12 p.m.	1,008.57	34,000

45. Pleasant Hill Reservoir near Perrysville, Ohio

Location. --Lat 40°37'25", long 82°19'30", at dam on Clear Fork, 2.5 miles south of Perrysville, Ashland County.
Drainage area. --199 sq mi.
Remarks. --Gage-height record and capacity curve furnished by Corps of Engineers.

Elevation, in feet, and contents, in acre-feet

Date	Time	Elevation	Contents	Date	Time	Elevation	Contents
Nov. 30, 1958	12 p.m.	1,019.57	13,160	Jan. 31, 1959	12 p.m.	1,019.82	13,360
Dec. 31	12 p.m.	1,019.56	13,150	Feb. 9	10 p.m.	1,022.77	16,020
Jan. 20, 1959	4 p.m.	1,019.99	13,520	12	1:30 a.m.	1,030.58	24,300
23	1:30 a.m.	1,044.01	43,540	28	12 p.m.	1,022.22	15,520

47. Mohicanville Reservoir near Mohicanville, Ohio

Location. --Lat 40°43'35", long 82°09'05", at dam on Lake Fork, 2 miles east of Mohicanville, Ashland County.
Drainage area. --269 sq mi.
Remarks. --Gage-height record and capacity curve furnished by Corps of Engineers.

Elevation, in feet, and contents, in acre-feet

Date	Time	Elevation	Contents	Date	Time	Elevation	Contents
Nov. 30, 1958	12 p.m.	933.99	83	Jan. 31, 1959	12 p.m.	955.87	48,830
Dec. 31	12 p.m.	933.92	80	Feb. 9	10 p.m.	951.00	24,000
Jan. 20, 1959	4 p.m.	934.07	87	11	10 p.m.	955.24	45,120
26	10:15 p.m.	956.85	54,870	28	12 p.m.	947.77	12,530

51. Kokosing River at Mount Vernon, Ohio

Location. --Lat 40°24'25", long 82°30'00", on right bank at downstream side of Tilden Avenue Bridge at Mount Vernon, Knox County, 0.8 mile downstream from North Branch and 2.7 miles upstream from Dry Run.
Drainage area. --200 sq mi.
Gage-height record. --Water-stage recorder graph. Datum of gage is 984.16 ft above mean sea level, datum of 1929, supplementary adjustment of 1944 (levels by Corps of Engineers).
Discharge record. --Stage-discharge relation defined by current-meter measurements below 6,350 cfs and extended above on basis of slope-area measurements of 1959 peak flow. Backwater from ice Dec. 1, 6-22, 26, Jan. 5-7, 10-12.
Maxima. --January-February 1959: Discharge, 38,000 cfs 3:30 a.m. Jan. 21 (gage height, 18.19 ft).
1953 to December 1958: Discharge, 7,030 cfs Feb. 25, 1956 (gage height, 12.34 ft).
Remarks. --Some regulation by Knox Lake on East Branch of North Branch of Kokosing River.

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	70	181	372	11	95	85	2,150	21	75	14,600	228
2	69	512	264	12	90	80	815	22	75	7,310	220
3	71	292	232	13	85	81	678	23	72	1,380	358
4	122	217	405	14	80	87	982	24	83	774	550
5	246	150	292	15	80	498	1,610	25	87	584	327
6	160	140	210	16	75	451	804	26	85	455	280
7	140	130	179	17	75	246	578	27	81	381	260
8	130	115	164	18	75	208	475	28	75	314	252
9	110	105	167	19	70	180	358	29	77	284	-------
10	100	95	4,250	20	70	150	280	30	98	872	-------
								31	98	672	-------
Monthly mean discharge, in cubic feet per second									94.2	1,020	634
Runoff, in inches									.54	5.88	3.30

54. Mohawk Reservoir near Nellie, Ohio

Location.--Lat 40°21'10", long 82°05'15", at dam on Walhonding River, 1.5 miles northwest of Nellie, Coshocton County.
Drainage area.--1,501 sq mi.
Remarks.--Gage-height record and capacity curve furnished by Corps of Engineers.

Elevation, in feet, and contents, in acre-feet

Date	Time	Elevation	Contents	Date	Time	Elevation	Contents
Nov. 30, 1958	12 p.m.	802.52	222	Jan. 31, 1959	12 p.m.	867.86	142,600
Dec. 31	12 p.m.	802.63	230	Feb. 10	7 a.m.	847.50	55,600
Jan. 20, 1959	4 p.m.	804.56	390	12	12 m.	859.90	103,800
25	7:30 a.m.	873.94	176,100	28	12 p.m.	814.06	2,180

56. Killbuck Creek at Killbuck, Ohio

Location.--Lat 40°29'43", long 81°59'10", on right bank at downstream side of bridge on U. S. Highway 62 at Killbuck, Holmes County, an eighth of a mile downstream from Black Creek.
Drainage area.--466 sq mi.
Gage-height record.--Water-stage recorder graph except for periods Dec. 1-11, 2 p.m. Jan. 21 to 10 a.m. Jan. 24, Jan. 27-29, Feb. 2-7, 21-23, for which graph was reconstructed on basis of high-water mark in gage house and wire-weight gage readings made twice daily or oftener.
Discharge record.--Stage-discharge relation defined by current-meter measurements below 7,450 cfs and by slope-area measurement of 1959 peak flow. Backwater from ice Dec. 6-30, Jan. 5-14, 18-21 and Feb. 13-22.
Maxima.--January-February 1959: Discharge, 28,400 cfs 3 a.m. Jan. 22 (gage height, 21.75 ft, from high-water mark in gage house).
1930 to December 1958: Discharge, 28,500 cfs Aug. 7, 1935 (gage height, 21.77 ft, from floodmark).

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	188	309	1,200	11	172	225	2,770	21	140	6,980	620
2	168	845	902	12	176	210	2,380	22	148	17,300	660
3	154	688	726	13	160	200	1,600	23	154	6,120	784
4	194	570	816	14	145	196	1,250	24	158	6,040	957
5	329	400	652	15	146	455	1,450	25	150	4,910	873
6	305	340	506	16	150	592	1,200	26	145	3,470	866
7	190	305	393	17	154	441	1,050	27	142	2,590	801
8	198	290	434	18	150	370	900	28	140	1,900	734
9	190	270	397	19	145	340	780	29	138	1,430	--------
10	178	240	2,060	20	140	334	700	30	138	1,510	--------
								31	191	1,520	--------
Monthly mean discharge, in cubic feet per second									170	1,980	1,016
Runoff, in inches									.42	4.90	2.27

59. Senecaville Reservoir near Senacaville, Ohio

Location.--Lat 39°55'25", long 81°26'10", at dam on Seneca Fork, 1.5 miles southeast of Senecaville, Guernsey County.
Drainage area.--121 sq mi.
Remarks.--Gage-height record and capacity curve furnished by Corps of Engineers.

Elevation, in feet, and contents, in acre-feet

Date	Time	Elevation	Contents	Date	Time	Elevation	Contents
Nov. 30, 1958	12 p.m.	832.33	43,710	Jan. 31, 1959	12 p.m.	835.06	54,140
Dec. 31	12 p.m.	831.89	42,160	Feb. 9	12 p.m.	832.75	45,220
Jan. 20, 1959	1 p.m.	832.77	45,290	12	3 p.m.	835.05	54,100
25	4:15-5:15 p.m.	836.69	60,890	28	12 p.m.	832.44	44,100

60. Wills Creek Reservoir near Wills Creek, Ohio

Location.--Lat 40°09'25", long 81°50'55", at dam on Wills Creek, 1.3 miles south of village of Wills Creek, Coshocton County.
Drainage area.--844 sq mi.
Remarks.--Gage-height record and capacity curve furnished by Corps of Engineers.

Elevation, in feet, and contents, in acre-feet

Date	Time	Elevation	Contents	Date	Time	Elevation	Contents
Nov. 30, 1958	12 p.m.	742.22	6,220	Jan. 31, 1959	12 p.m.	753.38	26,900
Dec. 31	12 p.m.	742.77	6,760	Feb. 9	10 p.m.	744.54	8,860
Jan. 20, 1959	12 p.m.	744.65	9,000	16-17	7:30 p.m.-1:30 a.m.	764.51	74,810
26	7:30 a.m.	764.17	72,800	28	12 p.m.	744.21	8,420

70. Licking River at Toboso, Ohio

Location. --Lat 40°03'26", long 82°13'12", on right bank 30 ft downstream from highway bridge at Toboso, Licking County, and 3 miles downstream from Rocky Fork.
Drainage area. --672 sq mi.
Gage-height record. --Water-stage recorder graph. Datum of gage is 744.84 ft above mean sea level, adjustment of 1912.
Discharge record. --Stage-discharge relation defined by current-meter measurements. Backwater from ice Nov. 30, Dec. 1, 10-23, Jan. 10-12.
Maxima. --January-February 1959: Discharge, 49,800 cfs 5 a.m. Jan. 22 (gage height, 21.08 ft).
1902-06, 1921 to December 1958: Discharge, 32,500 cfs Jan. 27, 1952 (gage height, 18.75 ft).
Flood of March 1913 reached a stage of 20.0 ft (discharge, 35,000 cfs, computed by Muskingum Watershed Conservancy District).
Remarks. --Flow slightly regulated by Buckeye Lake on South Fork.

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	160	566	1,300	11	230	230	12,000	21	200	12,600	1,000
2	162	2,420	1,140	12	210	220	3,550	22	200	36,900	980
3	166	1,340	1,090	13	200	267	2,220	23	190	9,350	1,100
4	240	928	1,260	14	190	304	2,440	24	207	3,900	1,380
5	537	585	1,220	15	180	1,010	3,890	25	216	2,180	1,150
6	429	537	1,060	16	180	1,520	2,090	26	214	1,720	1,040
7	361	429	860	17	170	794	1,610	27	212	1,470	860
8	338	324	806	18	170	658	1,460	28	212	1,300	810
9	282	293	778	19	170	946	1,260	29	202	1,230	--------
10	250	260	9,720	20	180	658	1,080	30	238	1,580	--------
								31	267	1,620	--------
Monthly mean discharge, in cubic feet per second									231	2,843	2,113
Runoff, in inches									.40	4.88	3.27

78. Scioto River near Prospect, Ohio

Location. --Lat 40°25'10", long 83°11'50", on downstream side of pier of Hoskins Bridge in Delaware County, 1½ miles upstream from Ottawa Creek, 2 miles south of Prospect, Marion County, and 2½ miles downstream from Patton Run.
Drainage area. --571 sq mi.
Gage-height record. --Water-stage recorder graph. Datum of gage is 886.9 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers).
Discharge record. --Stage-discharge relation defined by current-meter measurements below 9,300 cfs. Backwater from ice Nov. 30, Dec. 1, 9-26, Jan. 5-14.
Maxima. --January-February 1959: Discharge, 10,100 cfs 11 p.m. Jan. 21 (gage height, 15.30 ft).
1925-32, 1939 to December 1958: Discharge, 10,100 cfs Mar. 22, 1927 (gage height, 15.0 ft, at Prospect, at datum 4.8 ft higher).
Maximum stage known, 21.1 ft Mar. 25, 1913, at Prospect (discharge, 27,000 cfs, computed by Franklin County Conservancy District).

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	170	120	2,770	11	160	130	5,060	21	100	5,340	527
2	184	238	2,180	12	160	120	6,610	22	95	9,140	527
3	175	367	1,140	13	140	110	5,520	23	95	9,510	542
4	235	362	846	14	130	100	3,740	24	100	9,300	792
5	520	300	796	15	120	412	3,150	25	110	8,540	945
6	684	270	629	16	110	736	3,270	26	110	6,730	778
7	482	220	396	17	100	918	2,910	27	109	4,130	657
8	322	190	376	18	100	810	1,900	28	96	2,410	645
9	240	160	354	19	100	594	1,280	29	91	1,100	--------
10	180	140	3,190	20	100	380	818	30	96	1,530	--------
								31	92	2,210	--------
Monthly mean discharge, in cubic feet per second									178	2,149	1,870
Runoff, in inches									.36	4.34	3.40

80. O'Shaughnessy Reservoir near Dublin, Ohio

Location. --Lat 40°09'15", long 83°07'34", in Delaware County, at dam on Scioto River, 4 miles north of Dublin, Franklin County.
Drainage area. --987 sq mi.
Remarks. --Capacity table computed from data furnished by city of Columbus.

80. O'Shaughnessy Reservoir near Dublin, Ohio--Continued

Elevation, in feet, and contents, in acre-feet

Date	Time	Elevation	Contents	Date	Time	Elevation	Contents
Nov. 30, 1958	12 p.m.	848.21	17,370	Jan. 22, 1959	6 a.m.	854.40	24,290
Dec. 31	12 p.m.	848.19	17,310	31	12 p.m.	849.18	18,290
Jan. 20, 1959	5 p.m.	848.43	17,550	Feb. 28	12 p.m.	848.56	17,680

81. Scioto River below O'Shaughnessy Dam, near Dublin, Ohio

Location. --Lat 40°08'36", long 83°07'14", on left bank in Delaware County, a quarter of a mile north of county line, three-quarters of a mile downstream from O'Shaughnessy Dam, and 3 miles north of Dublin, Franklin County.
Drainage area. --988 sq mi.
Gage-height record. --Water-stage recorder graph except for period 11 a.m. Jan. 5 to 5 p.m. Jan. 24, for which graph was reconstructed on basis of high-water mark in gage house, telemark readings, and engineer's readings. Datum of gage is 775.00 ft above mean sea level, adjustment of 1912.
Discharge record. --Stage-discharge relation defined by current-meter measurements below 33,000 cfs and extended above on basis of computations of flow over Griggs Dam.
Maxima. --January-February 1959: Discharge, 55,200 cfs 2 a.m. Jan. 22 (gage height, 22.02 ft from high-water mark).
1921 to December 1958: Discharge, 27,000 cfs Jan. 15, 1937 (gage height, 15.45 ft).
Maximum stage known, 24.6 ft Mar. 25, 1913 (discharge, 74,500 cfs at Griggs Dam, 9 miles below gage, computed by C. E. Sherman, Ohio State University).
Remarks. --Flow regulated by O'Shaughnessy Reservoir.

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	239	294	3,300	11	248	200	13,000	21	144	27,300	906
2	248	769	2,670	12	263	180	8,490	22	137	42,900	844
3	248	828	1,820	13	226	160	7,150	23	137	16,000	862
4	354	785	1,470	14	191	150	5,500	24	144	11,000	1,300
5	853	350	1,380	15	172	600	5,300	25	154	10,300	1,530
6	1,100	400	1,020	16	154	1,000	5,000	26	154	8,100	1,330
7	836	350	737	17	147	1,000	4,150	27	157	4,970	1,140
8	565	300	610	18	144	800	2,940	28	150	2,980	1,110
9	361	250	579	19	150	600	2,040	29	147	1,780	-------
10	274	220	9,600	20	147	500	1,370	30	161	2,430	-------
								31	164	3,890	-------
Monthly mean discharge, in cubic feet per second									276	4,561	3,112
Mean discharge, adjusted for storage, cubic feet per second									275	4,577	3,101
Adjusted runoff, in inches									.32	5.34	3.27

82. Griggs Reservoir near Columbus, Ohio

Location. --Lat 40°00'54", long 83°05'38", at dam on Scioto River, 5½ miles northwest of Columbus, Franklin County, and 6½ miles upstream from Olentangy River.
Drainage area. --1,052 sq mi.
Remarks. --Capacity table computed from data furnished by City of Columbus.

Elevation, in feet, and contents, in acre-feet

Date	Time	Elevation	Contents	Date	Time	Elevation	Contents
Nov. 30, 1958	12 p.m.	755.56	4,670	Jan. 22, 1959	4 a.m.	763.91	7,730
Dec. 31	12 p.m.	755.54	4,660	31	12 p.m.	756.89	5,130
Jan. 20, 1959	12 m.	755.84	4,770	Feb. 28	12 p.m.	756.15	4,870

86. Delaware Reservoir near Delaware, Ohio

Location. --Lat 40°21'25", long 83°04'05", at dam on Olentangy River, 4 miles north of Delaware, Delaware County.
Drainage area. --381 sq mi.
Remarks. --Gage-height record and capacity curve

Elevation, in feet, and contents, in acre-feet

Date	Time	Elevation	Contents	Date	Time	Elevation	Contents
Nov. 30, 1958	12 p.m.	910.57	8,970	Jan. 25, 1959	1:30-4 p.m.	944.75	113,000
Dec. 31	12 p.m.	910.30	8,700	31	12 p.m.	932.97	51,100
Jan. 20, 1959	5 p.m.	910.18	8,580	Feb. 28	12 p.m.	910.57	8,970

90. Olentangy River near Worthington, Ohio

Location. --Lat 40°06'35", long 83°01'55", on right bank 30 ft downstream from Wilson bridge, 1½ miles northwest of Worthington, Franklin County and 2-3/4 miles upstream from Rush Run.
Drainage area. --493 sq mi.
Gage-height record. --Water-stage recorder graph except for period 6:30 a.m. to 1 p.m. Jan. 21, for which graph was reconstructed on basis of high-water mark in well. Datum of gage is 743.20 ft above mean sea level, datum of 1929, unadjusted.
Discharge record. --Stage-discharge relation defined by current-meter measurements below 13,600 cfs. Backwater from ice Nov. 30, Dec. 1, 10-21, Jan. 18-20.
Maxima. --January-February 1959: Discharge, 16,500 cfs 11 a.m. Jan. 21 (gage height, 15.68 ft from high-water mark).
1955 to December 1959: Discharge, 6,620 cfs May 20, 1957 (gage height, 11.58 ft in gage well, 11.82 ft from outside high-water mark).
Flood of January 1952 reached a discharge of 14,300 cfs (on basis of discharge at Stratford).
Remarks. --Flow regulated by Delaware Reservoir.

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	190	252	5,970	11	130	178	1,310	21	55	10,800	560
2	205	585	5,790	12	130	111	3,860	22	57	3,320	264
3	191	1,070	5,750	13	130	111	4,650	23	61	561	386
4	248	914	4,330	14	120	120	4,540	24	62	240	675
5	379	654	2,960	15	95	432	3,110	25	59	346	924
6	630	95	223	16	60	1,590	4,510	26	54	4,190	810
7	620	87	239	17	55	1,800	4,440	27	59	5,750	359
8	492	79	287	18	55	950	4,060	28	57	5,830	475
9	169	194	302	19	55	600	618	29	59	5,860	--------
10	150	191	3,890	20	55	700	700	30	68	5,850	--------
								31	140	5,780	--------
Monthly mean discharge, in cubic feet per second									158	1,911	2,357
Mean discharge, adjusted for storage, cubic feet per second									154	2,601	1,598
Adjusted runoff, in inches									.36	6.09	3.37

92. Scioto River at Columbus, Ohio

Location. --Lat 39°54'34", long 83°00'33", on right bank at sewage-treatment works of city of Columbus, Franklin County, 0.4 mile downstream from bridge on Frank Road.
Drainage area. --1,624 sq mi.
Gage-height record. --Water-stage recorder graph except Dec. 5-8, Jan. 1, and for period 1 p.m. Jan. 21 to 8 a.m. Jan. 22, for which graph was reconstructed on basis of high-water mark in gage house and Weather Bureau gage readings 4½ miles upstream. Datum of gage is 680.40 ft above mean sea level, adjustment of 1912.
Discharge record. --Stage-discharge relation defined by current-meter measurements below 45,100 cfs.
Maxima. --January-February 1959: Discharge, 68,200 cfs 1 a.m. Jan. 22 (gage height, 27.22 ft from high-water mark).
1920 to December 1958: Discharge, 40,300 cfs Jan. 27, 1952; maximum gage height, 24.70 ft Mar. 21, 1927, Jan. 27, 1952.
Maximum stage previously known, 25.9 ft Mar. 25, 1913 (discharge, 138,000 cfs, estimated by Franklin County Conservancy District). This stage is not comparable with present gage heights because of subsequent channel improvement and levee construction.
Remarks. --Flow regulated by Griggs Reservoir, by O'Shaughnessy Reservoir beginning in 1924, and by Delaware Reservoir beginning in 1947.

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	535	600	9,310	11	480	440	15,500	21	244	34,000	2,020
2	535	1,220	8,660	12	435	380	12,100	22	244	48,200	1,490
3	530	1,810	7,860	13	435	329	11,800	23	240	18,000	1,600
4	628	1,930	6,220	14	380	400	10,900	24	244	11,900	2,160
5	1,100	1,440	5,460	15	356	1,030	11,000	25	244	10,700	2,720
6	1,900	623	2,020	16	315	2,440	9,920	26	252	11,900	2,850
7	1,600	535	1,430	17	273	2,640	8,900	27	252	11,100	1,890
8	1,300	475	1,350	18	256	1,770	7,740	28	256	9,310	1,880
9	804	465	1,300	19	256	1,230	3,940	29	260	8,100	--------
10	562	475	12,900	20	281	1,240	2,590	30	264	8,070	--------
								31	285	9,490	--------
Monthly mean discharge, in cubic feet per second									508	6,524	5,982
Mean discharge, adjusted for storage, cubic feet per second									502	7,237	5,208
Adjusted runoff, in inches									.36	5.14	3.34

94. Hoover Reservoir at Central College, Ohio

Location. --Lat 40°06'30", long 82°53'00", at dam on Big Walnut Creek, half a mile northeast of Central College, Franklin County, and 12 miles northeast of Columbus.
Drainage area. --190 sq mi.
Remarks. --Capacity table computed from data furnished by city of Columbus.

Elevation, in feet, and contents, in acre-feet

Date	Time	Elevation	Contents	Date	Time	Elevation	Contents
Nov. 30, 1958	12 p.m.	887.27	53,100	Jan. 21, 1959	8:30 p.m.	894.76	74,680
Dec. 31	12 p.m.	886.88	52,080	31	12 p.m.	890.02	60,390
Jan. 20, 1959	12 m.	887.64	54,070	Feb. 28	12 p.m.	889.76	59,700

95. Big Walnut Creek at Central College, Ohio

Location. --Lat 40°06'13", long 82°53'03", a quarter of a mile east of Central College, Franklin County, 0.4 mile downstream from Hoover Dam, and 3 miles southeast of Westerville.
Drainage area. --190 sq mi.
Gage-height record. --Water-stage recorder graph. Datum of gage is 814.96 ft above mean sea level.
Discharge record. --Stage-discharge relation defined by current-meter measurements below 13,200 cfs and extended on basis of computations of flow over Hoover Dam. Backwater from ice Jan. 5, 21 (2-7 a.m.), 27, Jan. 30 to Feb. 1.
Maxima. --January-February 1959: Discharge, 23,800 cfs 10 p.m. Jan. 21 (gage height, 19.75 ft).
1938 to December 1958: Discharge, 14,400 cfs Aug. 4, 1943 (gage height, 16.6 ft).
Remarks. --Flow completely regulated by Hoover Dam beginning September 1954.

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	52	62	200	11	51	134	3,360	21	53	9,480	109
2	53	58	168	12	52	134	945	22	53	10,600	159
3	53	55	134	13	54	162	558	23	53	1,590	215
4	54	55	122	14	53	190	606	24	53	653	211
5	53	55	113	15	53	215	1,310	25	53	405	211
6	52	55	137	16	53	227	790	26	53	296	211
7	52	53	196	17	53	224	472	27	53	210	180
8	52	53	196	18	53	221	447	28	53	205	218
9	52	85	193	19	53	221	221	29	53	205	------
10	52	134	3,180	29	53	227	131	30	53	200	------
								31	53	200	------
Monthly mean discharge, in cubic feet per second									52.8	860	535
Mean discharge, adjusted for storage, cubic feet per second									36.2	995	523
Adjusted runoff, in inches									.22	6.04	2.86

96. Alum Creek at Columbus, Ohio

Location. --Lat 39°56'42", long 82°56'28", on left bank a quarter of a mile downstream from Livingston Avenue Bridge in Columbus, Franklin County, and 6 miles upstream from mouth.
Drainage area. --190 sq mi.
Gage-height record. --Water-stage recorder graph except for period 10:30 p.m. Jan. 21 to 8 a.m. Jan. 25 (recorder overtopped) for which graph was reconstructed on basis of high-water mark in gage house and engineer's readings. Datum of gage is 733.62 ft above mean sea level.
Discharge record. --Stage-discharge relation defined by current-meter measurements below 16,400 cfs and extended above on basis of contracted-opening measurement of 1959 peak flow. Backwater from ice Dec. 8-12, 14, 17-18, Jan. 5-10, 18-19.
Maxima. --January-February 1959: Discharge, 26,400 cfs 4 a.m. Jan. 22 (gage height, 19.59 ft, from high-water mark).
1923-35, 1938 to December 1958: Discharge, 8,800 cfs Feb. 27, 1929 (gage height, 13.6 ft).

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	23	120	226	11	35	41	5,130	21	25	8,030	114
2	22	303	143	12	30	33	659	22	23	16,600	117
3	23	326	130	13	30	30	464	23	23	1,970	170
4	60	212	161	14	25	49	690	24	23	550	392
5	192	160	152	15	25	219	1,920	25	23	332	252
6	154	110	117	16	22	347	705	26	24	230	188
7	115	95	112	17	20	310	405	27	26	164	164
8	85	75	112	18	20	180	340	28	24	132	161
9	60	65	116	19	24	150	233	29	24	130	------
10	45	45	3,410	20	29	150	135	30	31	312	------
								31	34	513	------
Monthly mean discharge, in cubic feet per second									42.5	1,032	585
Runoff, in inches									.26	6.26	3.21

98. Big Walnut Creek at Rees, Ohio

Location. --Lat 39°51'24", long 82°57'26", on right bank at downstream side of highway bridge, half a mile southwest of Rees, Franklin County, and 4¼ miles downstream from Alum Creek.
Drainage area. --544 sq mi.
Gage-height record. --Water-stage recorder graph except for period 3 a. m. Jan. 22 to 12:30 p. m. Jan. 26 for which graph was reconstructed on basis of high-water mark in gage house and outside gage readings. Datum of gage is 698.20 ft above mean sea level, adjustment of 1912.
Discharge record. --Stage-discharge relation defined by current-meter measurements below 16,800 cfs and extended above on basis of contracted-opening measurement of 1959 peak flow. Backwater from ice Dec. 17, 18, Jan. 7, 8.
Maxima. --January-February 1959: Discharge, 59,800 cfs 1 p. m. Jan. 22 (gage height, 22.03 ft, from high-water mark).
1921-25, 1938 to December 1958: Discharge, 21,800 cfs Feb. 27, 1929 (gage height, 18.0 ft).
Maximum stage known prior to 1959, 20.5 ft Mar. 25, 1913, present datum, at site 0.3 mile upstream.
Remarks. - Flow regulated by Hoover Reservoir beginning September 1954. Diversion above station for part of municipal supply of city of Columbus beginning June 15, 1956.

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	99	353	942	11	139	220	12,400	21	121	8,790	444
2	101	1,150	725	12	141	212	3,330	22	119	44,600	452
3	103	712	634	13	130	204	1,740	23	116	12,400	634
4	186	476	745	14	116	259	1,890	24	123	2,200	976
5	424	253	674	15	116	814	4,020	25	130	1,600	805
6	358	204	547	16	105	1,030	2,470	26	119	1,190	661
7	238	190	538	17	100	761	1,460	27	121	915	621
8	223	170	590	18	100	480	1,220	28	125	775	568
9	184	161	590	19	110	452	870	29	132	735	------
10	154	156	5,630	20	132	481	577	30	156	1,020	------
								31	168	1,310	------
Monthly mean discharge, in cubic feet per second									151	2,718	1,670
Mean discharge, adjusted for storage and diversion, in cubic feet per second									169	2,888	1,693
Adjusted runoff, in inches									.36	6.12	3.24

100. Darby Creek at Darbyville, Ohio

Location. --Lat 39°42'05", long 83°06'35", near right bank on downstream side of pier of bridge on State Highway 316, three-eights of a mile northeast of Darbyville, Pickaway County, and 3 miles downstream from Greenbrier Creek.
Drainage area. --533 sq mi.
Gage-height record. --Water-stage recorder graph. Datum of gage is 713.6 ft above mean sea level, adjustment of 1912.
Discharge record. --Stage-discharge relation defined by current-meter measurements below 21,300 cfs and extended above on basis of contracted-opening measurement.
Maxima. --January-February 1959: Discharge, 49,000 cfs 12 m. Jan. 22 (gage height, 17.94 ft).
1921-35, 1938 to December 1958: Discharge, 22,600 cfs Feb. 27, 1929 (gage height, 14.9 ft); maximum gage height observed, 15.9 ft Feb. 27, 1929 (backwater from ice).

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	94	177	1,780	11	199	200	12,100	21	126	6,600	640
2	103	602	1,070	12	180	190	6,640	22	130	38,400	675
3	105	1,120	892	13	160	180	2,860	23	126	15,400	635
4	108	710	1,060	14	150	199	2,760	24	130	5,580	862
5	262	511	1,360	15	136	352	4,670	25	132	3,160	862
6	529	350	826	16	126	1,560	3,670	26	120	2,080	700
7	343	310	550	17	126	1,500	2,150	27	120	1,540	615
8	278	270	541	18	118	850	1,690	28	116	1,140	565
9	250	240	499	19	128	700	1,280	29	124	952	------
10	220	220	4,310	20	128	650	874	30	130	1,290	------
								31	134	2,880	------
Monthly mean discharge, in cubic feet per second									166	2,900	2,041
Runoff, in inches									.36	6.27	3.99

102. Scioto River at Chillicothe, Ohio

Location. --Lat 39°20'31", long 82°58'27", on right bank at north end of Chillicothe, Ross County, 450 ft downstream from Bridge Street bridge on U. S. Highway 23.
Drainage area. --3,847 sq mi.
Gage-height record. --Water-stage recorder graph except for periods 3 a. m. to 2 p. m. and 5 p. m. to 9 p. m. Jan. 23, for which graph was reconstructed on basis of high-water mark in gage house. Datum of gage is 594.0 ft above mean sea level, adjustment of 1912.
Discharge record. --Stage-discharge relation defined by current-meter measurements below 122,000 cfs. Backwater from ice Dec. 11-22, Jan. 9-12.
Maxima. --January-February 1959: Discharge, 144,000 cfs 8 a. m. Jan. 23 (gage height, 32.50 ft from high-water mark).
1920 to December 1958: Discharge, 101,000 cfs Jan. 23, 1937 (gage height, 27.68 ft).
Maximum stage known, 39.8 ft Mar. 26, 1913 (discharge, 260,000 cfs, estimated by Franklin County Conservancy District).
Remarks. --Flow regulated by Griggs Reservoir, by O'Shaughnessy Reservoir beginning in 1924, by Delaware Reservoir beginning in 1947, and by Hoover Reservoir beginning in 1954.

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	1,130	1,020	13,600	11	1,200	1,200	18,400	21	850	11,800	4,910
2	965	2,840	12,700	12	1,200	1,200	36,700	22	800	35,700	4,140
3	965	4,720	11,200	13	1,100	1,180	34,700	23	774	127,000	3,750
4	1,030	4,390	10,200	14	1,000	1,100	23,000	24	782	71,700	4,380
5	1,620	3,440	8,870	15	950	1,720	21,200	25	822	35,100	5,200
6	2,710	2,560	7,440	16	900	3,820	21,800	26	830	21,200	5,220
7	3,010	1,920	4,140	17	900	5,690	20,100	27	822	16,500	4,850
8	2,600	1,740	3,430	18	850	5,060	15,400	28	798	15,400	4,020
9	2,310	1,500	3,310	19	850	3,610	12,100	29	790	13,100	--------
10	1,640	1,300	6,790	20	850	3,510	7,030	30	814	11,500	--------
								31	830	12,400	--------
Monthly mean discharge, in cubic feet per second									1,184	13,710	11,740
Mean discharge, adjusted for storage, cubic feet per second									1,161	14,558	10,953
Adjusted runoff, in inches									.35	4.36	2.97

120. Little Miami River at Milford, Ohio

Location. --Lat 39°10'17", long 84°17'53", on right bank 500 ft downstream from Wooster Pike Bridge in Milford, Clermont County, and 1¼ miles upstream from East Fork.
Drainage area. --1,195 sq mi.
Gage-height record. --Water-stage recorder graph except for period 11 a. m. Jan. 23 to 12 m. Jan. 24 for which graph was reconstructed on basis of graph before and after this period. Datum of gage is 499.35 ft above mean sea level, adjustment of 1912.
Discharge record. --Stage-discharge relation defined by current-meter measurements below 59,700 cfs and extended above on basis of slope-area measurement of 1959 peak flow. Backwater from ice Jan. 20.
Maxima. --January-February 1959: Discharge, 84,100 cfs 9 a. m. Jan. 22 (gage height, 22.30 ft).
1915-17, 1925-36, 1938 to December 1958: Discharge, 69,900 cfs Mar. 6, 1945 (gage height, 20.90 ft).
Remarks. --Some regulation by Cowan Lake on Cowan Creek, tributary to Todd Fork.

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	280	770	2,020	11	436	383	8,300	21	407	48,200	1,390
2	310	2,150	1,570	12	466	378	4,880	22	383	72,400	1,190
3	364	1,470	1,370	13	441	373	3,620	23	364	17,600	1,550
4	1,330	1,020	1,790	14	392	407	4,290	24	383	5,300	2,480
5	2,790	584	2,110	15	359	3,860	6,020	25	416	2,980	2,120
6	1,890	407	1,880	16	341	3,730	3,610	26	392	2,410	1,910
7	875	719	1,370	17	336	1,520	2,570	27	336	2,050	1,520
8	731	1,030	1,170	18	345	892	2,980	28	350	2,020	1,280
9	618	589	1,200	19	350	836	2,370	29	341	2,000	-----
10	466	441	11,200	20	359	2,900	1,870	30	336	2,470	-----
								31	327	2,600	-----
Monthly mean discharge, in cubic feet per second									565	5,951	2,844
Runoff, in inches									.55	5.74	2.48

122. Mill Creek at Reading, Ohio

Location. --Lat 39°13'15", long 84°26'50", on right bank at upstream side of Koehler Street Bridge at Reading, Hamilton County, 1 mile upstream from West Fork Mill Creek and 13 miles upstream from mouth.
Drainage area. --73.1 sq mi.
Gage-height record. --Water-stage recorder graph. Datum of gage is 527.00 ft above mean sea level, Ohio River datum. Twice-daily wire-weight readings used during periods of lagging intake, Dec. 10-23, Jan. 5-13, 17-19.
Discharge record. --Stage-discharge relation defined by current-meter measurements below 2,560 cfs and extended above on basis of slope-area measurement of 1959 peak flow.
Maxima. --January-February 1959: Discharge, 5,640 cfs 5 p. m. Jan. 21 (gage height, 19.67 ft).
1938 to December 1958: Discharge, 5,780 cfs Mar. 6, 1945 (gage height, 20.00 ft, present datum).

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	21	159	62	11	29	20	305	21	25	3,980	74
2	26	102	43	12	29	26	185	22	26	2,190	64
3	43	58	48	13	22	26	209	23	26	299	199
4	103	44	90	14	19	46	380	24	27	163	157
5	224	29	53	15	22	320	318	25	20	109	103
6	89	28	39	16	22	131	179	26	20	98	92
7	47	29	32	17	23	54	143	27	20	76	82
8	47	33	33	18	24	37	205	28	20	61	74
9	40	29	69	19	28	47	120	29	24	74	------
10	29	24	1,050	20	29	436	90	30	27	195	------
								31	26	107	------
Monthly mean discharge, in cubic feet per second									38.0	291	161
Runoff, in inches									.60	4.59	2.29

123. West Fork Mill Creek Reservoir near Greenhills, Ohio

Location. --Lat 39°15'40", long 84°29'40", at dam on West Fork Mill Creek, 1¼ miles east of Greenhills, Hamilton County.
Drainage area. --29.5 sq mi.
Remarks. --Gage-height record and capacity table furnished by Corps of Engineers.

Elevation, in feet, and contents, in acre-feet

Date	Time	Elevation	Contents	Date	Time	Elevation	Contents
Nov. 30, 1958	12 p.m.	675.09	1,550	Jan. 22, 1959	4:25 p.m.	698.96	9,750
Dec. 31	12 p.m.	675.06	1,540	31	12 p.m.	675.55	1,640
Jan. 19, 1959	12 p.m.	675.16	1,560	Feb. 28	12 p.m.	675.13	1,560

130. Miami River at Sidney, Ohio

Location. --Lat 40°17'14", long 84°08'57", on right bank 100 ft upstream from North Street Bridge in Sidney, Shelby County, and half a mile downstream from Tawawa Creek.
Drainage area. --545 sq mi.
Gage-height record. --Water-stage recorder graph except for period 10 a. m. Jan. 23 to 1 p. m. Jan. 28 for which graph was reconstructed on basis of recession graphs of other peaks or discharge estimated on basis of comparison with nearby stations. Datum of gage is 924.70 ft above mean sea level, adjustment of 1912.
Discharge record. --Stage-discharge relation defined by current-meter measurements below 9,200 cfs and extended above on basis of velocity-area studies. Backwater from ice Dec. 1, 8-18, 20-22, 24-26, 31, Jan. 6-12, 18, 19.
Maxima. --January-February 1959: Discharge, 16,800 cfs 11 p. m. Jan. 21 (gage height, 15.91 ft).
1914 to December 1958: Discharge, 20,700 cfs Mar. 20, 1927 (gage height, 14.4 ft).
Maximum stage known, 19.6 ft, present datum, Mar. 25, 1913 (discharge, 44,000 cfs, computed by Miami Conservancy District).
Remarks. --Data furnished by Miami Conservancy District. Some regulation by Indian Lake.

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	200	276	1,480	11	190	210	5,790	21	160	9,880	796
2	195	692	917	12	200	210	3,590	22	150	12,900	755
3	187	523	737	13	180	203	2,560	23	152	7,000	876
4	450	397	971	14	180	219	2,440	24	160	5,000	1,180
5	724	272	868	15	170	1,100	3,050	25	170	3,400	962
6	469	240	701	16	160	1,160	2,320	26	160	2,400	863
7	270	330	645	17	170	484	1,740	27	152	1,600	832
8	260	260	637	18	170	420	1,420	28	154	1,200	818
9	220	240	632	19	165	400	1,120	29	158	768	------
10	190	220	5,160	20	160	426	876	30	158	1,850	------
								31	150	2,170	------
Monthly mean discharge, in cubic feet per second									214	1,821	1,598
Runoff, in inches									.45	3.85	3.05

136. Miami River at Taylorsville, Ohio

Location. --Lat 39°52'22", long 84°09'51", on left bank 600 ft downstream from Taylorsville Dam, three-quarters of a mile north of Taylorsville, Montgomery County, and 9½ miles upstream from Stillwater River.
Drainage area. --1,155 sq mi.
Gage-height record. --Water-stage recorder graph. Datum of gage is 700.08 ft above mean sea level, adjustment of 1912.
Discharge record. --Stage-discharge relation defined by current-meter measurements below 23,200 cfs. Backwater from ice Dec. 1, 8-24, Jan. 5-13, 18-21.
Maxima. --January-February 1959: Discharge, 31,400 cfs 12 m. Jan. 22 (gage height, 75.44 ft).
1922 to December 1958: Discharge, 25,500 cfs Jan. 15, 1937 (gage height, 73.32 ft) and May 14, 1933 (gage height, 73.26 ft).
1914-17, Discharge, 26,400 cfs Jan. 2, 1916 (gage height, 15.4 ft at site 1-3/4 miles upstream at Tadmor at different datum).
Flood of March 1913 reached a stage of 25.4 ft at site at Tadmor (discharge, 127,000 cfs, computed by Miami Conservancy District).
Remarks. --Data furnished by Miami Conservancy District. Flood flow regulated by Taylorsville retarding basin just above station and by Lockington retarding basin on Loramie Creek. Flow slightly regulated by Indian Lake and by Lake Loramie.

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	480	408	3,020	11	370	380	16,400	21	310	11,700	1,530
2	452	1,080	1,940	12	390	380	10,400	22	300	30,200	1,510
3	408	1,130	1,500	13	360	380	5,250	23	290	24,500	1,560
4	572	820	1,750	14	330	408	4,630	24	300	16,400	2,240
5	1,340	500	1,680	15	310	1,310	7,500	25	300	9,770	2,000
6	1,120	420	1,330	16	310	2,510	5,360	26	287	4,760	1,720
7	694	500	1,160	17	310	1,370	3,610	27	291	3,170	1,610
8	600	550	1,130	18	310	750	2,940	28	287	2,190	1,520
9	500	470	1,110	19	310	750	2,340	29	287	1,620	--------
10	380	410	9,490	20	310	900	1,750	30	296	3,060	--------
								31	283	4,310	--------
Monthly mean discharge, in cubic feet per second									422	4,100	3,499
Runoff, in inches									.42	4.09	3.16

139. Stillwater River at Pleasant Hill, Ohio

Location. --Lat 40°03'28", long 84°21'22", on left bank at downstream side of highway bridge three-quarters of a mile northwest of Pleasant Hill, Miami County, and 2 miles downstream from Painter Creek.
Drainage area. --502 sq mi.
Gage-height record. --Water-stage recorder graph except for period 10 p. m. Jan. 22 to 12 m. Jan. 23 for which graph was reconstructed on basis of graph before and after this period. Datum of gage is 846.73 ft above mean sea level, adjustment of 1912.
Discharge record. --Stage-discharge relation defined by current-meter measurements below 14,800 cfs and extended above on basis of contracted-opening measurements.
Maxima. --January-February 1959: Discharge, 19,300 cfs 8 p. m. Jan. 21 (gage height, 17.98 ft).
1916-28, 1934 to December 1958: Discharge, 26,400 cfs Jan. 14, 1937 (gage height, 17.32 ft).
Maximum stage known, 17.5 ft Mar. 25, 1913 (discharge, 51,400 cfs, at site about 3 miles upstream computed by Miami Conservancy District). This stage is not comparable with present gage heights because of failure of levee in 1913.
Remarks. --Data furnished by Miami Conservancy District.

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	210	355	864	11	193	157	6,960	21	147	11,700	464
2	219	1,310	533	12	200	162	2,510	22	134	14,600	432
3	207	632	484	13	170	166	1,590	23	142	6,580	640
4	486	408	705	14	155	191	2,360	24	166	2,690	1,160
5	870	205	489	15	140	1,260	4,430	25	155	1,320	786
6	511	260	329	16	142	1,150	2,130	26	130	1,040	640
7	317	282	276	17	155	479	1,400	27	134	720	586
8	293	246	282	18	149	419	1,160	28	134	538	543
9	210	202	297	19	149	364	814	29	132	464	-------
10	177	175	6,080	20	157	364	562	30	128	2,310	-------
								31	118	1,780	-------
Monthly mean discharge, in cubic feet per second									214	1,694	1,411
Runoff, in inches									.49	3.88	2.93

142. Stillwater River at Englewood, Ohio

Location. --Lat 39°52'10", long 84°16'57", on right bank 1,000 ft downstream from Englewood Dam, 1 mile southeast of Englewood, Montgomery County, and 8½ miles upstream from mouth.
Drainage area. --646 sq mi.
Gage-height record. --Water-stage recorder graph. Datum of gage is 699.97 ft above mean sea level, adjustment of 1912.
Discharge record. --Stage-discharge relation defined by current-meter measurements.
Maxima. --January-February 1959: Discharge, 9,450 cfs 8 a.m. Jan. 23 (gage height, 80.21 ft).
1925 to December 1958: Discharge, 9,980 cfs June 15, 1958 (gage height, 80.88 ft).
Maximum discharge during flood in March 1913, 85,400 cfs, at site one mile downstream, computed by Miami Conservancy District.
Remarks. --Flood flow regulated by Englewood retarding basin. Data furnished by Miami Conservancy District.

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	262	279	1,440	11	255	226	7,040	21	209	4,680	730
2	290	1,340	956	12	280	214	6,870	22	193	8,900	748
3	276	1,120	792	13	250	226	5,670	23	193	9,400	748
4	401	712	1,010	14	230	238	4,000	24	209	9,000	1,400
5	1,120	381	940	15	200	1,040	4,580	25	226	8,230	1,240
6	892	372	609	16	200	1,780	4,240	26	193	7,170	1,000
7	514	405	477	17	226	818	2,250	27	188	5,660	892
8	432	397	477	18	209	533	1,600	28	188	2,600	818
9	389	311	464	19	209	542	1,300	29	188	818	--------
10	269	255	4,340	20	209	507	932	30	188	1,930	--------
								31	171	2,910	--------
Monthly mean discharge, in cubic feet per second									299	2,355	2,056
Runoff, in inches									.53	4.21	3.31

148. Mad River near Springfield, Ohio

Location. --Lat 39°55'23", long 83°52'13", on right bank 150 ft downstream from Rock Run, 2 miles downstream from Buck Creek and 3 miles west of Springfield, Clark County.
Drainage area. --485 sq mi.
Gage-height record. --Water-stage recorder graph. Datum of gage is 881.42 ft above mean sea level, adjustment of 1912.
Discharge record. --Stage-discharge relation defined by current-meter measurements below 13,500 cfs and extended on basis of contracted-opening and slope-area measurements of 1959 peak flow.
Maxima. --January-February 1959: Discharge, 30,500 cfs 9 p.m. Jan. 21 (gage height, 15.76 ft).
1904-5, 1914 to December 1958: Discharge, 23,000 cfs Feb. 26, 1929 (gage height, 14.9 ft).
Maximum stage known, 16.9 ft Mar. 25, 1913, present datum (discharge 55,400 cfs, computed by Miami Conservancy District).
Remarks. --Data furnished by Miami Conservancy District.

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	307	462	994	11	324	282	4,730	21	292	17,400	799
2	318	590	850	12	329	292	1,830	22	297	16,700	774
3	329	450	842	13	307	297	1,650	23	307	4,380	913
4	456	400	1,200	14	292	363	2,240	24	313	2,020	913
5	515	313	842	15	287	1,320	2,500	25	292	1,570	799
6	412	346	714	16	297	860	1,520	26	292	1,350	765
7	369	346	648	17	302	555	1,320	27	292	1,160	722
8	369	329	624	18	297	488	1,160	28	276	1,020	714
9	346	318	656	19	307	475	985	29	287	985	------
10	318	302	9,000	20	307	558	868	30	292	1,880	------
								31	282	1,270	------
Monthly mean discharge, in cubic feet per second									323	1,906	1,485
Runoff, in inches									.77	4.53	3.19

150. Mad River near Dayton, Ohio

Location. --Lat 39°47'48", long 84°05'32", on left bank 600 ft downstream from Huffman Dam, 2½ miles downstream from Mad Run, and 5 miles northeast of Dayton, Montgomery County.
Drainage area. --632 sq mi.
Gage-height record. --Water-stage recorder graph except for period 4 a.m. to 12 m. Jan. 22 for which graph was reconstructed on basis of highwater mark in house. Datum of gage is 699.95 ft above mean sea level, adjustment of 1912. Temporary staff gage 1,000 ft downstream used Dec. 1 to Jan. 20.
Discharge record. --Stage-discharge relation defined by current-meter measurements below 18,800 cfs. Stage-discharge relation indefinite, discharge estimated Jan. 24 to Feb. 6. Gage-height record doubtful, discharge estimated Dec. 9-12, 14-16, Feb. 7-9.

150. Mad River near Dayton, Ohio--Continued

Maxima. --January-February 1959: Discharge, 21,200 cfs 2 p. m. Jan. 22 (gage height, 87.30 ft). Maximum gage height, 87.78 ft 8 a. m. Jan. 22.
1914 to December 1958: Discharge, 18,400 cfs Feb. 26, 1929 (gage height, 87.9 ft).
Maximum stage known, 14.0 ft Mar. 25, 1913, at site 1 mile upstream at datum 83.96 ft higher, (discharge, 75,700 cfs, computed by Miami Conservancy District).
Remarks. --Flood flow regulated by Huffman retarding basin beginning in 1921. Data furnished by Miami Conservancy District.

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	387	393	1,300	11	400	337	10,300	21	346	6,920	1,100
2	387	822	1,100	12	410	346	3,410	22	337	20,200	1,000
3	373	569	1,100	13	387	393	2,280	23	342	17,200	1,270
4	480	499	1,400	14	370	393	2,480	24	360	5,000	1,260
5	697	747	1,100	15	350	1,180	3,410	25	346	2,200	1,100
6	569	811	950	16	360	1,490	2,170	26	333	1,700	1,040
7	480	473	850	17	360	811	1,800	27	337	1,500	990
8	473	393	800	18	351	717	1,590	28	333	1,300	960
9	430	408	800	19	351	522	1,360	29	325	1,200	--------
10	400	393	5,810	20	364	499	1,200	30	337	2,300	--------
								31	329	1,700	--------
Monthly mean discharge, in cubic feet per second									390	2,368	1,926
Runoff, in inches									.71	4.32	3.18

155. Miami River at Miamisburg, Ohio

Location. --Lat 39°38'45", long 84°17'20", on left bank 600 ft downstream from bridge on State Highway 725 at Miamisburg, Montgomery County, and 0.3 mile downstream from Bear Creek.
Drainage area. --2,718 sq mi.
Gage-height record. --Water-stage recorder graph except for period 9 a. m.-3 p. m. Jan. 21, 1 p. m. Jan. 22 to 11 a. m. Jan. 23 and for periods of partially plugged intake Jan. 28-29, 31, Feb. 2-3, 10-11, 21, for which graph was reconstructed on basis of wire-weight gage readings. Datum of gage is 678.60 ft above mean sea level, adjustment of 1912.
Discharge record. --Stage-discharge relation defined by current-meter measurements below 59,800 cfs.
Maxima. --January-February 1959: Discharge, 62,000 cfs 7 p. m. Jan. 21 (gage height, 20.69 ft).
1916-20, 1924-35, 1952 to December 1958: Maximum discharge, 55,000 cfs Feb. 27, 1929 (gage height, 16.5 ft, at site 2.2 miles downstream at datum 677.06 ft above mean sea level).
Maximum discharge known, 257,000 cfs Mar. 26, 1913, computed by Miami Conservancy District.
Remarks. --Flood flow regulated by four retarding basins beginning in 1920. Gage-height record furnished by Dayton Power & Light Co. Discharge measurements furnished by Miami Conservancy District.

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	1,180	1,460	7,790	11	1,270	1,160	32,600	21	1,020	35,000	4,360
2	1,280	2,900	5,990	12	1,340	1,170	24,300	22	1,000	54,400	4,270
3	1,320	3,600	5,110	13	1,230	1,220	15,400	23	1,000	55,600	4,470
4	1,590	2,560	5,590	14	1,100	1,310	13,000	24	1,020	37,800	5,590
5	3,120	1,500	5,250	15	1,030	3,440	15,500	25	1,000	23,600	5,610
6	3,210	1,260	4,290	16	1,040	6,430	13,900	26	1,000	16,400	4,840
7	2,140	1,520	3,530	17	1,100	3,850	9,800	27	980	13,000	4,480
8	1,790	1,650	3,300	18	1,070	2,110	7,650	28	970	9,330	4,270
9	1,620	1,510	3,390	19	1,070	2,070	6,470	29	980	5,110	--------
10	1,280	1,320	16,700	20	1,070	2,350	5,150	30	1,000	7,190	--------
								31	970	11,100	--------
Monthly mean discharge, in cubic feet per second									1,316	10,090	8,664
Runoff, in inches									.56	4.28	3.32

159. Twin Creek near Germantown, Ohio

Location. --Lat 39°38'10", long 84°23'48", on right bank a quarter of a mile downstream from Germantown Dam, 1½ miles northwest of Germantown, Montgomery County, and 3 miles upstream from Little Twin Creek.
Drainage area. --275 sq mi.
Gage-height record. --Water-stage recorder graph except Dec. 1-4, Jan. 5-7 for which graph was reconstructed on basis of weather records and comparison with nearby stations. Datum of gage is 700.24 ft above mean sea level, adjustment of 1912.
Discharge record. --Stage-discharge relation defined by current-meter measurements below 7,700 cfs. Backwater from ice Dec. 7-31, Jan. 8-14, 17-21.
Maxima. --January-February 1959: Discharge, 8,590 cfs 4 a. m. Jan. 22 (gage height, 29.19 ft).
1921-23; 1926 to December 1958: Discharge, 8,790 cfs Jan. 27, 1952 (gage height, 28.76 ft).
1914-20: Discharge, 9,390 cfs July 8, 1915 (gage height, 11.7 ft, from graph based on gage readings, at site 1 mile downstream at datum 12.49 ft higher).
Maximum stage known, 18.3 ft Mar. 25, 1913, original site and datum (discharge, 66,000 cfs, computed by Miami Conservancy District).

159. Twin Creek near Germantown, Ohio--Continued

Remarks. --Flood flow regulated by Germantown retarding basin beginning in 1920. Data furnished by Miami Conservancy District.

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	95	442	495	11	100	85	6,100	21	75	5,500	203
2	100	747	278	12	100	85	2,080	22	75	8,450	206
3	95	372	284	13	90	90	968	23	75	7,710	278
4	180	263	534	14	80	100	1,710	24	85	6,390	456
5	398	130	287	15	75	911	2,860	25	80	1,600	349
6	267	160	172	16	75	694	1,160	26	75	478	296
7	190	140	139	17	75	300	751	27	70	334	257
8	130	120	141	18	75	180	586	28	65	233	225
9	110	100	152	19	75	160	396	29	65	217	------
10	100	90	4,600	20	80	170	257	30	65	1,370	------
								31	65	940	------
Monthly mean discharge, in cubic feet per second									106	1,246	936
Runoff, in inches									.44	5.22	3.54

164. Miami River at Hamilton, Ohio

Location. --Lat 39°23'28", long 84°34'20", on right bank 1,000 ft downstream from Columbia Bridge at Hamilton, Butler County, and 3 miles downstream from Talawanda Creek.
Drainage area. --3,639 sq mi.
Gage-height record. --Water-stage recorder graph. Datum of gage is 499.98 ft above mean sea level, adjustment of 1912.
Discharge record. --Stage-discharge relation defined by current-meter measurements below 74,000 cfs and extended above on basis of slope-area measurement of 1959 peak flow.
Maxima. --January-February 1959: Discharge, 108,000 cfs 9:30 p. m. Jan. 21 (gage height, 79.49 ft).
1910-18: Discharge, 352,000 cfs Mar. 26, 1913 (gage height, 38.5 ft, at site 0.7 mile upstream at datum 64.65 ft higher), computed by Miami Conservancy District.
1927 to December 1958: Discharge, 78,800 cfs Mar. 19, 1943 (gage height 76.6 ft).
Remarks. --Flood flow regulated by five retarding basins beginning in 1920. Data furnished by Miami Conservancy District.

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	1,490	2,510	10,700	11	1,630	1,560	37,000	21	1,380	56,300	5,670
2	1,540	4,060	7,470	12	1,740	1,470	35,900	22	1,310	73,900	5,320
3	1,640	4,620	6,170	13	1,680	1,540	20,500	23	1,310	63,500	5,840
4	2,360	3,580	6,770	14	1,490	1,680	18,600	24	1,310	53,500	6,650
5	3,780	2,280	6,750	15	1,360	4,900	22,200	25	1,260	33,400	7,080
6	4,200	1,680	5,550	16	1,290	7,630	18,400	26	1,220	20,600	6,170
7	3,020	1,920	4,710	17	1,400	5,170	13,200	27	1,230	15,700	5,670
8	2,410	2,200	4,360	18	1,400	3,240	10,100	28	1,200	12,200	5,370
9	2,280	2,040	4,340	19	1,370	2,750	8,360	29	1,190	7,890	--------
10	1,820	1,780	22,900	20	1,420	3,410	6,820	30	1,210	8,880	--------
								31	1,210	13,200	--------
Monthly mean discharge, in cubic feet per second									1,714	13,520	11,380
Runoff, in inches									.54	4.29	3.26

172. Blanchard River near Findlay, Ohio

Location. --Lat 41°03'21", long 83°41'17", on left bank on upstream side of highway bridge, 2 miles west of Findlay, Hancock County, and 3 miles downstream from Eagle Creek.
Drainage area. --343 sq mi.
Gage-height record. --Water-stage recorder graph except for period 6 a. m. Jan. 23 to 8 a. m. Jan. 25 and 4 a. m. Jan. 26 to 12 m. Jan. 27 for which graph was reconstructed on basis of graph before and after the period. Datum of gage is 754.55 ft above mean sea level.
Discharge record. --Stage-discharge relation defined by current-meter measurements below 10,400 cfs. Backwater from ice Dec. 13-21, Jan. 17-18, Feb. 6, 21.
Maxima. --January 1959: Discharge, 13,100 cfs 10 a. m. Jan. 22 (gage height, 16.11 ft).
February 1959: Discharge, 15,000 cfs 1 a. m. Feb. 11 (gage height, 16.76 ft).
1923-35, 1940 to December 1958: Discharge, 11,800 cfs Dec. 1, 1927 (gage height, 15.4 ft, from graph based on gage readings).
Flood in March 1913 reached a stage of 18.5 ft (discharge, 22,000 cfs, from rating curve extended above 9,500 cfs).

172. Blanchard River near Findlay, Ohio--Continued

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	120	87	1,200	11	51	37	10,300	21	40	2,350	240
2	115	158	484	12	48	34	4,050	22	42	11,600	255
3	106	147	290	13	50	37	1,350	23	44	8,400	682
4	216	109	394	14	50	45	1,180	24	48	4,200	1,210
5	399	82	296	15	50	118	2,120	25	47	2,000	663
6	304	77	220	16	45	142	1,520	26	42	1,000	420
7	192	66	145	17	40	120	818	27	41	550	399
8	150	54	134	18	40	100	622	28	40	279	448
9	96	50	140	19	40	86	445	29	42	248	------
10	59	42	8,930	20	40	78	291	30	44	2,200	------
								31	38	1,710	------
Monthly mean discharge, in cubic feet per second									86.4	1,168	1,402
Runoff, in inches									.29	3.93	4.26

178. Maumee River near Defiance, Ohio

Location. --Lat 41°17'30", long 84°16'50", on left bank 40 ft upstream from Independence Dam, 275 ft downstream from point of diversion to Miami and Erie Canal, 4 miles downstream from Auglaize River, and 4½ miles east of Defiance, Defiance County.
Drainage area. --5,530 sq mi.
Gage-height record. --Water-stage recorder graph. Datum of gage is 659.12 ft above mean sea level.
Discharge record. --Stage-discharge relation defined by current-meter measurements.
Maxima. --January 1959: Discharge, 35,000 cfs 12 m. Jan. 24 (gage height, 7.07 ft).
February 1959: Discharge, 76,500 cfs 9 a.m. Feb. 12 (gage height, 12.35 ft).
1924-35, 1939 to December 1958: Discharge, 87,100 cfs Feb. 16, 1950 (gage height, 13.70 ft).
Remarks. --Records herein include the flow of the Miami & Erie Canal.

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	3,550	794	19,900	11	1,400	1,320	59,700	21	712	3,720	9,620
2	2,810	2,340	16,200	12	1,380	1,100	72,800	22	733	9,930	7,280
3	2,810	4,860	10,600	13	1,320	950	71,200	23	691	24,800	9,310
4	2,280	4,940	6,900	14	1,200	904	56,900	24	691	32,800	15,400
5	3,500	3,440	6,350	15	1,060	1,500	47,600	25	543	30,000	16,700
6	3,230	2,160	5,780	16	950	1,700	41,400	26	783	22,800	13,500
7	3,650	2,020	4,280	17	904	2,300	32,200	27	733	16,800	10,900
8	2,400	1,960	2,850	18	858	1,840	25,600	28	490	12,600	10,900
9	2,020	1,800	2,670	19	691	1,640	19,400	29	651	9,630	---------
10	1,380	1,540	24,700	20	815	1,420	12,100	30	691	12,000	---------
								31	733	16,600	---------
Monthly mean discharge, in cubic feet per second									1,473	7,491	22,600
Runoff, in inches									.31	1.56	4.26

185. Sandusky River near Mexico, Ohio

Location. --Lat 41°02'39", long 83°11'42", on right bank at downstream side of highway bridge, 3 miles upstream from Honey Creek and 4¼ miles north of Mexico, Seneca County.
Drainage area. --776 sq mi.
Gage-height record. --Water-stage recorder graph except for period 8 a.m. Jan. 23 to 4:30 a.m. Jan. 24 for which graph was reconstructed on basis of high-water mark in well, and Feb. 2-3, reconstructed on basis of weather records. Datum of gage is 733.1 ft above mean sea level, adjustment of 1912.
Discharge record. --Stage-discharge relation defined by current-meter measurements below 15,600 cfs. Backwater from ice Dec. 8 to Jan. 21.
Maxima. --January 1959: Discharge, 18,900 cfs 10 p.m. Jan. 23 (gage height, 22.43 ft).
February 1959: Discharge, 10,600 cfs 8-10 a.m. Feb. 11 (gage height, 16.77 ft).
1923-35, 1938 to December 1958: Discharge, 15,200 cfs Mar. 22, 1927 (gage height 19.9 ft, from graph based on gage readings).
Flood in June 1937 reached a stage of 22.5, from information by local residents (discharge, 19,000 cfs).

185. Sandusky River near Mexico, Ohio--Continued

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	328	160	3,110	11	190	110	10,300	21	120	3,800	700
2	362	270	2,100	12	150	100	9,920	22	110	11,400	684
3	328	420	1,200	13	140	90	7,480	23	110	16,700	922
4	436	350	958	14	140	110	3,400	24	110	16,200	1,970
5	985	280	864	15	140	150	4,490	25	120	9,620	1,750
6	1,260	230	859	16	140	350	4,630	26	110	4,540	1,130
7	842	200	642	17	130	450	3,700	27	110	2,180	877
8	550	170	439	18	130	350	2,180	28	110	1,200	904
9	400	150	400	19	120	250	1,540	29	110	846	--------
10	270	130	6,680	20	120	210	958	30	110	1,990	--------
								31	110	3,300	--------
Monthly mean discharge, in cubic feet per second									271	2,461	2,671
Runoff, in inches									.40	3.66	3.58

193. Huron River at Milan, Ohio

Location. --Lat 41°18'00", long 82°36'30", on right bank 500 ft downstream from birdge on U. S. Highway 250, a quarter of a mile northwest of Milan, Erie County, and 2 miles downstream from confluence of East and West Branches.

Drainage area. --363 sq mi.

Gage-height record. --Water-stage recorder graph except 1 p. m. Jan. 22 to 1 p. m. Jan. 25 for which graph was reconstructed on basis of normal recession curve. Datum of gage is 573.43 ft above mean sea level, adjustment of 1912.

Discharge record. --Stage-discharge relation defined by current-meter measurements below 18,100 cfs and extended on basis of contracted-opening measurement of 1959 peak flow. Backwater from ice Dec. 1-4, Dec. 7, to Jan. 21 (3 p. m.) Jan. 26 to Feb. 10 (2 a. m.), Feb. 20-23.

Maxima. --January 1959: Discharge, 25,800 cfs 4 a. m. Jan. 22 (gage height, 24.08 ft).
February 1959: Discharge, 18,500 cfs 7 p. m. Feb. 10 (gage height, 21.54 ft).
1950 to December 1958: Discharge, 18,200 cfs May 12, 1956 (gage height, 21.10 ft).

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	150	120	1,200	11	95	60	6,790	21	70	5,500	300
2	150	250	600	12	85	55	1,610	22	65	18,500	290
3	160	220	320	13	85	65	1,160	23	65	4,300	900
4	550	170	340	14	85	85	1,790	24	70	1,600	1,610
5	804	140	300	15	80	200	3,830	25	65	900	601
6	348	120	230	16	80	270	1,220	26	65	650	426
7	250	100	150	17	75	200	804	27	65	450	508
8	190	85	150	18	75	160	723	28	65	340	532
9	150	75	150	19	70	130	432	29	65	280	------
10	110	70	12,500	20	70	120	340	30	60	1,700	------
								31	60	2,100	------
Monthly mean discharge, in cubic feet per second									141	1,259	1,422
Runoff, in inches									.45	4.00	4.08

201. Cuyahoga River at Independence, Ohio

Location. --Lat 41°23'44", long 81°37'54", on right bank 140 ft downstream from highway bridge on Rockside Road, 1 mile northeast of Independence, Cuyahoga County, and 3 miles downstream from Tinkers Creek.

Drainage area. --709 sq mi.

Gage-height record. --Water-stage recorder graph except for period 9:30 p. m. Jan. 21 to 3 a. m. Jan. 22, 7 a. m. Jan. 23 to 4:30 p. m. Jan. 27 for which graph was reconstructed on basis of high-water mark in well and normal recession curve. Datum of gage is 584.14 ft above mean sea level (levels by city of Cleveland).

Discharge record. --Stage-discharge relation defined by current-meter measurements below 17,100 cfs and extended on basis of contracted-opening measurement of 1959 peak flow. Backwater from ice Jan. 6, 7.

Maxima. --January 1959: Discharge, 24,800 cfs 12:30 a. m. Jan. 22 (gage height, 22.41 ft).
February 1959: Discharge, 16,100 cfs 5:30 p. m. Feb. 10 (gage height, 20,15 ft).
1921-23, 1927-35, 1940 to December 1958: Discharge, 14,300 cfs Oct. 16, 1954 (gage height, 20.04 ft).
Maximum flood known occurred Mar. 25, 1913 (discharge, 32,400 cfs, at Cleveland, estimated by the Cleveland city engineer).

Remarks. --Water is diverted into the Ohio Canal at Brecksville, 6 miles above station, but the canal flows are included in the tabulated discharges. Flood flows slightly regulated by reservoirs and lakes in the basin.

201. Cuyahoga River at Independence, Ohio--Continued

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	675	909	2,070	11	616	516	11,000	21	463	10,100	1,580
2	675	2,040	1,690	12	601	490	6,820	22	462	16,700	1,500
3	684	1,300	1,540	13	567	497	5,500	23	480	8,890	2,400
4	1,220	1,150	1,770	14	514	476	5,540	24	527	5,800	2,920
5	1,370	880	1,560	15	502	1,090	7,160	25	505	4,000	2,140
6	1,070	770	1,320	16	496	978	4,680	26	468	3,200	1,970
7	819	730	1,170	17	477	802	3,610	27	492	2,600	2,250
8	730	660	1,120	18	473	764	2,990	28	470	2,300	2,080
9	705	616	1,090	19	477	725	2,530	29	474	1,920	--------
10	629	555	12,100	20	483	691	1,910	30	597	3,960	--------
								31	532	2,750	-------
Monthly mean discharge, in cubic feet per second									621	2,544	3,358
Runoff, in inches									1.01	4.14	4.94

207. Grand River near Madison, Ohio

Location. --Lat 41°44'46", long 81°02'48", on downstream end of center pier of bridge on State Highway 528, half a mile upstream from Griswold Creek and 2 miles south of Madison, Lake County.
Drainage area. --587 sq mi.
Gage-height record. --Water-stage recorder graph. Datum of gage is 674.47 ft above mean sea level, adjustment of 1912.
Discharge record. --Stage-discharge relation defined by current-meter measurements below 12,200 cfs and extended on basis of estimate of flow over dam for 1959 peak flow. Backwater from ice Dec. 7 to Jan. 22 (4 a.m.).
Maxima. --January 1959: Discharge, 21,100 cfs 5 p.m. Jan. 22 (gage height, 14.73 ft).
February 1959: Discharge, 10,900 cfs 7 a.m. Feb. 11 (gage height, 10.73 ft).
1922-35, 1938 to December 1958: Discharge, 16,600 cfs Mar. 22, 1948 (gage height, 12.48 ft).

Mean discharge, in cubic feet per second, December 1958-February 1959

Day	December	January	February	Day	December	January	February	Day	December	January	February
1	501	700	2,150	11	400	270	9,970	21	240	2,500	978
2	545	2,200	1,510	12	370	220	6,590	22	230	18,000	637
3	564	2,400	1,230	13	330	200	6,020	23	230	13,700	480
4	1,170	1,800	880	14	310	180	5,530	24	230	9,020	997
5	2,390	1,300	796	15	300	700	6,040	25	220	7,040	1,320
6	1,790	1,100	743	16	290	1,000	4,410	26	220	4,660	1,310
7	1,000	950	647	17	280	700	2,640	27	220	2,760	1,760
8	700	700	428	18	270	500	2,000	28	220	1,640	2,400
9	550	500	342	19	260	400	1,600	29	220	958	--------
10	450	350	4,010	20	250	340	1,200	30	210	1,980	--------
								31	210	2,990	--------
Monthly mean discharge, in cubic feet per second									489	2,670	2,451
Runoff, in inches									.96	5.25	4.35

Table 5.--Summary of flood stages and discharges for the floods of January-February 1959

No.	Stream and place of determination	Drainage area (sq mi)	Period of record	Maximum flood previously known			Maximum during present flood				
				Date	Gage height (feet)	Discharge (cfs)	Date	Gage height (feet)	Discharge		
									Cfs	Cfs per sq mi	Ratio to $Q_{2.33}$
1	Mahoning River at Alliance--------	87.9	1941-	May 27, 1946	7.90	7,000	Jan. 21	9.11	9,740	111	3.30
2	Beech Creek near Bolton----------	18.8	1943-54	June 24, 1950	8.27	2,210	Jan. 21-22	7.6	-------	-------	-----
3	Deer Creek at Limaville----------	31.9	1941-55	Jan. 26, 1952	*10.18	1,530	Jan. 21-22	14.0	-------	-------	-----
4	Mill Creek near Berlin Center-----	19.7	1941-	May 27, 1946	6.92	1,900	Jan. 21	7.01	1,890	95.9	1.75
5	Berlin Reservoir near Berlin Center.	249	1942-	July 8, 1943	1,032.00	[a]91,150	Jan. 24	1,025.70	[a]62,010	-------	-----
6	Milton Reservoir at Pricetown-----	276	1923-	June 29, 1924	953.8	[a]35,020	Jan. 27	951.67	[a]30,520	-------	-----
7	Kale Creek at Pricetown----------	20.9	1940-	May 27, 1944	8.3	3,630	Jan. 21	8.52	3,890	186	3.24
8	Hinkley Creek near Charlestown----	10.8	1947-	Nov. 16, 1955	12.62	584	Jan. 21	13.91	943	87.3	2.86
9	West Branch Mahoning River near Newton Falls.	97.8	1926-	Feb. 26, 1929	11.8	6,090	Jan. 22	13.60	8,340	85.3	2.88
10	Ordnance Creek near Newton Falls--	.16	1950-	May 12, 1956	6.98	103	Jan. 21	5.54	92	575	-----
11	Eagle Creek at Phalanx Station----	97.0	1926-34, 1937-	Feb. 27, 1929	12.9	5,950	Jan. 22	13.12	6,700	69.1	2.91
12	Mahoning River at Leavittsburg----	580	1941-	Jan. 27, 1952	15.88	[b]9,720	Jan. 22	19.37	[b]20,300	35.0	[b]3.08
13	Walnut Creek at Cortland----------	9.12	1947-	Oct. 15, 1954	4.60	1,200	Jan. 21	5.06	1,400	154	2.19
14	Mosquito Creek Reservoir near Cortland.	97.4	1943-	June 3, 1947	903.65	[a]101,100	Feb. 16	901.47	[a]82,920	-------	-----
15	Mosquito Creek at Niles----------	139	1929-51	Dec. 30, 1942	5.16	3,080	Jan. 21-22	4.35	[b]1,950	14.0	-----
16	Meander Creek Reservoir at Mineral Ridge.	84.9	1929-	May 13, 1956	908.65	[a]40,360	Jan. 21	909.25	[a]41,800	-------	-----
17	Mahoning River at Youngstown------	899	1921-	Jan. 25, 1937 Mar. 26, 1913	14.92 26.5	[b]17,600 42,500	Jan. 22	18.62	[b]16,900	18.8	[b]1.99
18	Mill Creek at Youngstown----------	68.4	1943-	May 27, 1946 March 1913	9.00 --------	6,100 7,140	Jan. 22	7.49	4,290	62.7	2.14
19	Crab Creek near Youngstown--------	7.15	--------	----------	--------	--------	Jan. 21	--------	1,170	164	-----
20	Crab Creek at Youngstown----------	15.9	--------	----------	--------	--------	Jan. 21	--------	2,140	135	-----
21	Mahoning River at Lowellville-----	1,076	1942-	May 27, 1946	13.73	[b]20,000	Jan. 21	14.43	[b]21,000	19.5	[b]2.02
22	Little Beaver Creek near East Liverpool.	505	1915-	July 19, 1941	17.4	25,000	Jan. 22	14.70	17,000	33.7	1.39
23	Tuscarawas River at Clinton-------	165	1926-	Aug. 8, 1935 March 1913	14.82 22.2	[b]2,700 --------	Jan. 22	15.50	[b]2,120	12.8	[b]1.46
24	Little Chippewa Creek near Smithville.	13.9	1947-	Apr. 24, 1957	13.33	1,360	Jan. 21-22	14.30	1,800	129	2.61
25	Chippewa Creek at Easton----------	146	--------	----------	--------	--------	Jan. 21	--------	10,100	69.2	-----
26	Tuscarawas River at Massillon-----	526	1937-	Mar. 5, 1940	11.39	6,940	Jan. 22	13.46	7,220	13.7	1.85
27	Sandy Creek at Waynesburg---------	254	1938-	Jan. 27, 1952	7.95	6,100	Jan. 22	10.05	15,000	59.1	3.53
28	Middle Branch Nimishillen Creek at Canton.	44.2	1941-	Jan. 27, 1952	5.77	1,180	Jan. 22	6.50	2,470	55.9	3.09
29	Nimishillen Creek at North Industry.	175	1921-	Feb. 26, 1929	9.9	6,660	Jan. 21	11.29	8,620	49.3	2.61
30	Bolivar Reservoir at Bolivar------	502	1938-	Feb. 8, 1952	942.29	[a]57,830	Jan. 26	944.01	[a]63,440	-------	-----

31	Leesville Reservoir near Leesville	47.9	1938-	Apr. 17, 1948	969.59	[a]26,760	Jan. 24	966.87	[a]23,610	-------	-----
32	Atwood Reservoir near New Cumberland.	70.3	1938-	Feb. 8, 1952	934.51	[a]35,220	Jan. 26	933.16	[a]32,600	-------	-----
33	Dover Reservoir near Dover--------	1,397	1938-	June 11, 1947	902.68	[a]92,890	Jan. 25-26	901.65	[a]86,120	-------	-----
34	Tuscarawas River below Dover Dam, near Dover.	1,398	1923-	Jan. 26, 1937	15.51	[a]26,400	Jan. 21	6.98	[b]6,220	4.45	[b].71
				March 1913	23.5	62,000					
35	Beach City Reservoir near Beach City.	300	1938-	June 10, 1947	968.56	[a]34,100	Jan. 23	973.24	[a]53,520	-------	-----
36	Piedmont Reservoir at Piedmont----	84.0	1938-	June 1947	918.33	[a]46,710	Jan. 24	916.56	[a]42,120	-------	-----
37	Clendening Reservoir at Tippecanoe	69.5	1938-	Feb. 7, 1952	903.85	[a]38,080	Feb. 15	900.64	[a]31,520	-------	-----
38	Stillwater River at Uhrichsville--	367	1922-	August 1935	*18.36	7,650	Jan. 22	5.72	[b]3,410	9.29	[b]1.00
				March 1913	15.5	--------					
39	Tappan Reservoir at Tappan--------	71.0	1938-	February 1952	904.53	[a]48,480	Feb. 15	901.10	[a]39,460	-------	-----
40	Tuscarawas River at Newcomerstown-	2,436	1921-	Jan. 26, 1937	20.65	[b]46,800	Jan. 22	10.05	[b]13,700	5.62	[b].96
				March 1913	--------	83,000					
41	Whetstone Creek tributary near Olivesburg.	.236	1950-	July 26, 1956	5.71	155	Jan. 21	5.53	79	335	-----
42	Charles Mill Reservoir near Mifflin.	216	1938-	June 19, 1947	1,013.34	[a]52,930	Jan. 25	1,013.53	[a]53,780	-------	-----
43	Touby Run at Mansfield----------	5.17	1947-	June 6, 1947	4.17	965	Jan. 21	3.94	910	176	1.82
44	Clear Fork at Butler----------	143	1944-	Apr. 12, 1948	8.01	7,100	Jan. 21	9.43	14,300	100	3.58
				Jan. 16, 1950	7.98	7,100					
45	Pleasant Hill Reservoir near Perrysville.	199	1938-	June 8, 1947	1,036.69	[a]32,220	Jan. 23	1,044.01	[a]43,540	-------	-----
46	Jerome Fork at Jeromeville--------	120	1925-49	January 1937	11.40	3,720	Jan. 22	14.1	13,000	108	5.00
				March 1913	15.1	--------					
47	Mohicanville Reservoir near Mohicanville.	269	1938-	June 15, 1947	957.60	[a]59,820	Jan. 26	956.85	[a]54,870	-------	-----
48	Mohican River at Greer----------	942	1921-	Aug. 7, 1935	13.63	17,700	Jan. 22	12.39	[b]15,600	16.6	[b]2.20
				March 1913	27.0	55,000					
49	Kokosing River at Uhrichsville----	38.1	--------	April 1948	--------	3,380	Jan. 21	--------	9,620	252	-----
50	East Branch of North Branch Kokosing River at Knox Lake Dam, near Fredericktown.	30.3	--------	----------	--------	--------	Jan. 22	--------	3,450	114	-----
51	Kokosing River at Mount Vernon----	200	1953-	Feb. 25, 1956	12.34	7,030	Jan. 21	18.19	38,000	190	-----
52	Dry Creek near Bangs----------	21.7	--------	----------	--------	--------	Jan. 21	--------	5,810	268	-----
53	Kokosing River at Millwood--------	454	1921-	June 22, 1937	18.10	27,500	Jan. 21	34.0	75,900	167	7.16
				March 1913	--------	40,000					
54	Mohawk Reservoir near Nellie------	1,501	1938-	June 10, 1947	864.76	[a]126,800	Jan. 25	873.94	[a]176,100	-------	-----
55	Walhonding River below Mohawk Dam, at Nellie.	1,502	1921-	Feb. 26, 1929	--------	27,400	Feb. 9	12.72	[b]9,650	6.42	[b].88
				March 1913	--------	80,000					
56	Killbuck Creek at Killbuck--------	466	1930-	Aug. 7, 1935	21.77	28,500	Jan. 22	21.75	28,400	60.9	6.45
57	Mill Creek near Coshocton---------	27.5	1936-	June 28, 1957	12.73	7,650	Jan. 21	11.40	4,440	161	3.70
58	Muskingum River near Coshocton----	4,847	1936-	Jan. 26, 1937	21.98	[b]78,700	Jan. 22	13.43	[b]32,900	6.79	[b]1.22
				March 1913	--------	202,000					
59	Senecaville Reservoir near Senecaville.	121	1938-	Mar. 24, 1945	837.27	[a]63,370	Jan. 25	836.69	[a]60,890	-------	-----
60	Wills Creek Reservoir near Wills Creek.	844	1938-	Mar. 11, 1945	771.38	[a]122,200	Feb. 16-17	764.51	[a]74,810	-------	-----

See footnotes at end of table.

Table 5.--Summary of flood stages and discharges for the floods of January-February 1959--Continued

No.	Stream and place of determination	Drainage area (sq mi)	Period of record	Maximum flood previously known			Maximum during present flood				
				Date	Gage height (feet)	Discharge (cfs)	Date	Gage height (feet	Discharge		
									Cfs	Cfs per sq mi	Ratio to $Q_{2.33}$
61	Wakatomika Creek near Frazeysburg-	140	1936-	Jan. 27, 1952	11.61	10,000	Jan. 22	13.15	13,700	97.9	2.91
62	Muskingum River at Dresden--------	5,982	1921-	Aug. 9, 1935	31.6	100,000	Jan. 22	20.50	[b]39,400	6.59	[b]1.18
				March 1913	46.0	228,000					
63	South Fork Licking River near Hebron.	133	1939-48	Mar. 6, 1945	12.1	5,200	Jan. 21	12.4	5,880	44.2	-----
64	Raccoon Creek at Granville--------	83.0	1939-48	Mar. 3, 1940	13.6	6,240	Jan. 21	16.6	8,700	105	-----
65	Raccoon Creek at Newark-----------	104	--------	----------	--------	--------	Jan. 21	-------	10,400	100	-----
66	Otter Fork near Centerburg--------	2.97	1947-	June 29, 1947	13.25	368	Jan. 21	13.52	445	150	2.71
67	North Fork Licking River at Utica-	114	1939-48	Apr. 13, 1948	12.4	6,400	Jan. 21	15.8	-------	-------	-----
				July 1956	13.2	--------					
68	North Fork Licking River at Newark	239	--------	----------	--------	--------	Jan. 21	-------	29,800	125	-----
69	Licking River near Newark---------	536	1939-	Jan. 27, 1952	16.59	25,000	Jan. 21	20.3	45,000	84.0	3.75
70	Licking River at Toboso-----------	672	1902-06,	Jan. 27, 1952	18.75	32,500	Jan. 22	21.08	49,800	74.1	3.56
			1921-	March 1913	20.0	35,000					
71	Licking River at Dillon-----------	754	1939-	Mar. 7, 1945	27.57	30,300	Jan. 22	32.46	47,000	62.3	3.62
				March 1913	37.0	--------					
72	Muskingum River at McConnelsville-	7,411	1921-	Jan. 26, 1937	21.14	[b]126,000	Jan. 23	14.38	[b]81,600	11.0	[b]1.67
				Mar. 27, 1913	33.5	270,000					
73	Hocking River at Athens-----------	944	1915-	January 1907	26.7	50,000	Jan. 23	19.38	15,800	16.7	1.11
				Mar. 7, 1945	23.0	30,400					
74	Raccoon Creek at Adamsville-------	587	1915-35,	Apr. 15, 1948	24.92	15,500	Jan. 24	19.42	7,090	12.1	1.01
			1938-	January 1937	25.2	--------					
75	Scioto River at Foraker-----------	102	--------	----------	--------	--------	Jan. 21	-------	4,420	43.3	-----
76	Scioto River at La Rue------------	255	1926-35,	Mar. 20, 1927	15.0	10,700	Jan. 21	15.30	16,300	63.9	2.99
			1938-51	Mar. 26, 1913	17.8	--------					
77	Little Scioto River above Marion--	70.0	1938-	June 7, 1947	8.16	3,720	Jan. 22	8.73	4,990	71.3	3.02
78	Scioto River near Prospect--------	571	1925-32,	Mar. 22, 1927	--------	10,100	Jan. 21	15.30	10,100	17.7	1.50
			1939-	Mar. 25, 1913	--------	27,000					
79	Mill Creek near Bellepoint--------	181	1942-	May 27, 1956	9.92	7,170	Jan. 22	13.85	20,300	112	4.14
80	O'Shaughnessy Reservoir near Dublin.	987	1924-	Jan. 28, 1952	851.74	[a]21,050	Jan. 22	854.40	[a]24,290	-------	-----
81	Scioto River below O'Shaughnessy Dam, near Dublin.	988	1921-	Jan. 15, 1937	15.45	[b]27,000	Jan. 22	22.04	[b]55,200	55.9	[b]3.78
				Mar. 25, 1913	24.6	74,500					
82	Griggs Reservoir near Columbus----	1,052	1921-	Jan. 27, 1952	760.63	[a]6,490	Jan. 22	763.91	[a]7,730	-------	-----
				Mar. 25, 1913	766.2	--------					
83	Olentangy River at Claridon-------	156	1946-	June 7, 1947	13.57	6,800	Jan. 22	16.77	14,900	95.5	4.52
84	Shaw Creek at Shawtown------------	25.2	1946-55	Apr. 12, 1948	6.05	1,250	Jan. 21	8.12	4,120	163	4.58
85	Whetstone Creek at Ashley---------	98.5	1954-	Feb. 25, 1956	8.54	4,020	Jan. 21	14.34	19,100	194	-----
86	Delaware Reservoir near Delaware--	381	1951-	Apr. 6, 1957	931.14	[a]45,300	Jan. 25	944.75	[a]113,000	-------	-----
87	Olentangy River near Delaware-----	387	1923-34,	Mar. 21, 1927	--------	14,100	Jan. 31	88.11	[b]6,000	15.5	-----
			1938-								
88	Delaware Run near Delaware--------	3.33	1947-	Feb. 14, 1948	12.42	780	Jan. 21	13.01	1,050	315	-----
89	Olentangy River at Stratford------	438	1934-35,	June 19, 1939	8.77	15,600	Jan. 21	6.75	[b]9,600	21.9	-----
			1938-								

90	Olentangy River near Worthington--	493	1955-	January 1952	------	[b]14,300	Jan. 21	15.68	[b]16,500	33.5	-----
				May 20, 1957	11.58	[b]6,620					
91	Scioto River at Columbus----------	1,613	1897-	Mar. 25, 1913	16.2	--------	Jan. 22	16.2	-------	------	-----
92	Scioto River at Columbus----------	1,624	1920-	Jan. 27, 1952	24.70	[b]40,300	Jan. 22	27.22	[b]68,200	42.0	-----
				Mar. 25, 1913	25.9	138,000					
93	Scioto Big Run at Briggsdale------	11.0	1947-	July 20, 1954	11.92	2,790	Jan. 21	12.09	2,920	265	2.09
94	Hoover Reservoir at Central College.	190	1955-	Apr. 4, 1957	891.90	[a]65,600	Jan. 21	894.76	[a]74,680	------	-----
95	Big Walnut Creek at Central College.	190	1938-	Aug. 4, 1943	16.6	14,400	Jan. 21	19.75	[b]23,800	125	-----
96	Alum Creek at Columbus------------	190	1923-35, 1938-	Feb. 27, 1929	13.6	8,800	Jan. 22	19.59	26,400	139	5.18
97	Blacklick Creek near Groveport----	58.5	--------	June 22, 1956	------	12,300	Jan. 21	------	10,300	176	-----
98	Big Walnut Creek at Rees----------	544	1921-35, 1938-	Feb. 27, 1929	18.0	21,800	Jan. 22	22.03	[b]59,800	110	[b]4.50
				Mar. 25, 1913	20.5	--------					
99	Scioto River near Circleville-----	2,635	1939-56	Mar. 7, 1945	*24.07	69,200	Jan. 22	27.2	[b]100,000	38.0	-----
				Mar. 26, 1913	34						
100	Darby Creek at Darbyville---------	533	1921-35, 1938-	Feb. 27, 1929	14.9	22,600	Jan. 22	17.94	49,000	91.9	4.67
101	Deer Creek at Williamsport--------	331	1926-35, 1938-56	Feb. 26, 1929	14.7	29,300	Jan. 22	17.6	39,600	120	3.96
102	Scioto River at Chillicothe-------	3,847	1920-	Jan. 23, 1937	27.68	101,000	Jan. 23	32.50	[b]144,000	37.4	-----
				Mar. 26, 1913	39.8	260,000					
103	East Fork Paint Creek near Sedalia	4.23	1947-	Mar. 22, 1948	13.77	292	Jan. 21	14.47	515	122	2.60
104	Paint Creek near Greenfield-------	251	1926-35, 1939-56	Apr. 20, 1940	10.8	13,900	Jan. 21	11.0	14,500	57.8	2.46
105	Paint Creek near Bourneville------	808	1921-37, 1938-	Mar. 6, 1945	19.2	52,100	Jan. 22	16.63	[b]24,700	30.6	-----
106	Scioto River at Higby-------------	5,129	1930-	Jan. 23, 1937	26.4	177,000	Jan. 23	26.40	[b]160,000	31.2	-----
				Mar. 26, 1913	31.6	--------					
107	Little Miami River near Selma-----	50.6	1952-	Aug. 3, 1958	8.59	3,500	Jan. 21	9.42	7,920	157	-----
108	North Fork Little Miami River near Pitchin.	29.1	1952-	Aug. 2, 1958	6.04	955	Jan. 21	7.58	3,350	115	-----
109	Little Miami River near Oldtown	129	1952-	June 8, 1954	10.2	4,720	Jan. 21	12.20	14,800	115	-----
110	North Fork Massie Creek at Cedarville.	25.6	1954-	Aug. 2, 1958	7.62	1,620	Jan. 21	8.55	2,960	116	-----
111	South Fork Massie Creek near Cedarville.	20.2	1954-	Aug. 2, 1958	7.24	1,130	Jan. 21	8.27	2,440	121	-----
112	Massie Creek at Wilberforce-------	64.3	1952-	Aug. 2, 1958	10.35	4,300	Jan. 21	11.25	7,300	114	-----
113	Shawnee Creek at Xenia------------	4.21	1948-	Feb. 15, 1949	15.71	790	Jan. 21	16.02	855	203	1.55
114	Little Miami River at Spring Valley.	361	1925-35, 1939-51	Feb. 26, 1929	16.8	18,400	Jan. 21-22	19.0	36,400	101	4.39
115	Caesar Creek near Xenia-----------	66.8	--------	----------	------	--------	Jan. 21	------	10,600	159	-----
116	Anderson Fork near Lumberton------	58.0	--------	----------	------	--------	Jan. 21	------	7,600	131	-----
117	Little Miami River near Fort Ancient.	677	1938-51	Mar. 7, 1945	16.80	32,900	Jan. 21	21.9	67,000	99.0	4.35
118	Todd Fork near Roachester---------	219	1952-	July 22, 1958	17.55	14,500	Jan. 21	19.50	25,500	116	-----
119	Little Miami River at Kings Mills-	1,048	1912-	Mar. 26, 1913	33.7	--------	Jan. 22	31.80	--------	------	-----
120	Little Miami River at Milford-----	1,195	1915-17, 1925-36, 1938-	Mar. 6, 1945	20.90	69,900	Jan. 22	22.30	84,100	70.4	2.63

See footnotes at end of table.

Table 5.--Summary of flood stages and discharges for the floods of January-February 1959--Continued

No.	Stream and place of determination	Drainage area (sq mi)	Period of record	Maximum flood previously known			Maximum during present flood				
				Date	Gage height (feet)	Discharge (cfs)	Date	Gage height (feet)	Discharge		
									Cfs	Cfs per sq mi	Ratio to $Q_{2.33}$
121	East Fork Little Miami River at Perintown.	477	1915-20, 1925-	Mar. 6, 1945	23.42	39,400	Jan. 21	21.24	32,000	67.1	1.54
122	Mill Creek at Reading----------	73.1	1938-	Mar. 6, 1945	20.00	5,780	Jan. 21	19.67	5,640	77.2	1.74
123	West Fork Mill Creek Reservoir near Greenhills.	29.5	1953-	Apr. 5, 1957	689.76	[a]5,720	Jan. 22	698.96	[a]9,750	-------	-----
124	West Fork Mill Creek at Woodlawn--	31.9	1952-	Apr. 4, 1956	6.82	[b]2,000	Jan. 23	5.56	[b]1,340	42.0	-----
125	West Fork Mill Creek at Lockland--	35.6	1938-	May 25, 1947	16.93	6,310	Jan. 21	10.63	[b]1,700	47.8	-----
126	Mill Creek at Carthage----------	116	1946-	May 25, 1947	14.21	8,300	Jan. 21	16.17	[b]8,900	76.7	-----
127	Indian Lake at Russells Point-----	109	1946-	June 29, 1957	3.23	--------	Jan. 22	3.58	--------	-------	-----
				March 1913	5.3	--------					
128	Buckongahelas Creek near DeGraff--	37.5	1957-	June 10, 1958	5.24	662	Jan. 21	6.83	1,960	52.3	-----
129	Miami River at Quincy----------	408	1946-49	June 3, 1947	12.1	4,860	January	16.5	--------	-------	-----
130	Miami River at Sidney----------	545	1914-	Mar. 20, 1927	14.4	20,700	Jan. 21	15.91	16,800	30.8	1.98
				Mar. 25, 1913	19.6	44,000					
131	Lockington retarding basin at Lockington.	261	1922-	June 11, 1958	912.2	[a]12,000	Jan. 22	909.8	[a]9,500	-------	-----
132	Loramie Creek at Lockington-------	261	1915-	May 7, 1916	86.4	10,400	Jan. 22	84.43	[b]5,750	22.0	[b]1.24
				Mar. 25, 1913	91.6	25,600					
133	Miami River at Piqua----------	842	1910-	Mar. 25, 1913	29.1	--------	Jan. 21	14.8	--------	-------	-----
134	Lost Creek near Troy----------	55.3	--------	March 1913	-------	29,700	Jan. 21	-------	5,650	102	-----
135	Taylorsville retarding basin at Taylorsville.	1,155	1922-	May 14, 1933	787.1	[a]12,800	Jan. 22	791.5	[a]21,500	-------	-----
136	Miami River at Taylorsville-------	1,155	1914-17, 1922-	Jan. 2, 1916	-------	26,400	Jan. 22	75.44	[b]31,400	27.2	[b]1.85
				March 1913	-------	127,000					
137	Poplar Creek near Vandalia--------	3.16	1947-	Nov. 16, 1955	6.07	1,110	Jan. 21	6.10	1,130	358	2.13
138	Greenville Creek near Bradford----	195	1930-	May 14, 1933	9.2	9,320	Jan. 21	8.93	5,990	30.7	1.64
				March 1913	12.1	18,200					
139	Stillwater River at Pleasant Hill-	502	1916-28, 1934-	Jan. 14, 1937	17.32	26,400	Jan. 21	17.98	19,300	38.4	1.61
				Mar. 25, 1913	17.5	51,400					
140	Hog Run tributary at Laura--------	.46	1950-	May 22, 1953	7.65	204	Jan. 21	6.00	54	117	-----
141	Englewood retarding basin at Englewood.	646	1922-	June 15, 1958	831.3	[a]65,800	Jan. 23	825.1	[a]48,000	-------	-----
142	Stillwater River at Englewood-----	646	1925-	June 15, 1958	80.88	[b]9,980	Jan. 23	80.21	[b]9,450	14.6	[b]1.24
				March 1913	--------	85,400					
143	Mad River at Zanesfield-----------	6.41	1947-	Apr. 11, 1948	6.76	1,380	Jan. 21	5.05	794	124	1,13
144	Mad River near Urbana-------------	157	1925-31, 1939-	Feb. 26, 1929	10.4	7,740	Jan. 22	12.05	8,000	51.0	2.81
145	Buck Creek at New Moorefield------	67.3	1942-58	Feb. 14, 1948	7.46	5,150	Jan. 21	7.7	8,130	121	4.57
146	Beaver Creek near Springfield-----	37.3	1942-58	Feb. 13, 1948	7.95	4,980	Jan. 21	9.0	5,400	145	2.70
147	Buck Creek at Springfield---------	137	1914-21, 1924-	Feb. 26, 1929	14.3	13,000	Jan. 21	12.39	10,500	76.6	3.00
				Mar. 25, 1913	13.3	11,100					
148	Mad River near Springfield--------	485	1904-05, 1914-	Feb. 26, 1929	14.9	23,000	Jan. 21	15.76	30,500	62.9	3.35
				Mar. 25, 1913	16.9	55,400					
149	Huffman retarding basin near Dayton.	632	1922-	Feb. 26, 1929	805.2	[a]14,100	Jan. 22	809.0	[a]25,000	-------	-----

150	Mad River near Dayton	632	1914-	Feb. 26, 1929	87.9	[b]18,400	Jan. 22	87.30	[b]21,200	33.5	[b]2.44
				Mar. 25, 1913	--------	75,700					
151	Miami River at Dayton	2,513	1905-06,	Apr. 21, 1920	--------	59,800	Jan. 22	35.45	[b]60,800	24.2	[b]2.00
			1913-	Mar. 26, 1913	--------	250,000					
152	Wolf Creek near Trotwood	48.2	--------	----------	--------	--------	Jan. 21-22	-------	6,990	145	-----
153	Wolf Creek at Dayton	69.5	1938-50	Mar. 19, 1943	53.5	9,950	Jan. 21	55.1	--------	------	-----
154	Holes Creek near Kettering	20.6	--------	----------	--------	--------	Jan. 21	-------	4,730	230	-----
155	Miami River at Miamisburg	2,718	1916-20,	Feb. 27, 1929	--------	[b]55,000	Jan. 21	20.69	[b]62,000	22.8	[b]1.88
			1924-35,	Mar. 26, 1913	--------	257,000					
			1952-								
156	Clear Creek at Franklin	46.7	--------	----------	--------	--------	Jan. 21	-------	13,300	285	-----
157	Twin Creek near Ingomar	198	--------	----------	--------	--------	Jan. 21	18.8	30,300	153	-----
158	Germantown retarding basin near Germantown.	275	1922-	Feb. 26, 1929	778.3	[a]21,400	Jan. 22	787.2	[a]33,600	------	-----
159	Twin Creek near Germantown	275	1914-20,	July 8, 1915	--------	9,390	Jan. 22	29.19	[b]8,590	31.2	[b]1.43
			1921-23,	Mar. 25, 1913	--------	66,000					
			1926-								
160	Dicks Creek near Excello	44.8	--------	----------	--------	--------	Jan. 21	-------	9,830	219	-----
161	Fourmile Creek at Hueston Woods Dam.	102	--------	----------	--------	--------	Jan. 21	-------	13,300	130	-----
162	Sevenmile Creek at Collinsville	121	--------	----------	--------	--------	Jan. 21	-------	16,600	137	-----
163	Talawanda Creek near Hamilton	311	1937-	Jan. 4, 1949	21.0	33,500	Jan. 21	21.40	44,500	143	2.82
164	Miami River at Hamilton	3,639	1910-18,	Mar. 26, 1913	--------	352,000	Jan. 21	79.49	[b]108,000	29.7	[b]2.16
			1927-	Mar. 19, 1943	76.6	[b]78,800					
165	Indian Creek near Millville	99.1	--------	----------	--------	--------	Jan. 21	-------	23,500	237	-----
166	Miami River at Maimitown	3,880	--------	----------	--------	---------	Jan. 22	31.4	[b]115,000	29.6	-----
167	Tenmile Creek at Toledo	158	1943,	June 1, 1943	11.4	3,400	Feb. 12	9.27	1,500	9.5	-----
			1945-48,								
			1950								
168	Auglaize River near Fort Jennings	333	1921-35,	Feb. 15, 1950	17.8	9,550	Jan. 23	20.30	12,000	36.0	2.18
			1940-								
169	Ottawa River at Allentown	168	1923-35,	June 29, 1957	9.45	5,300	Jan. 22	10.88	7,740	46.1	2.62
			1943-	Mar. 15, 1933	10.1	--------					
170	Blanchard River near Forest	82.5	--------	----------	--------	--------	Jan. 21	-------	12,300	149	-----
171	Eagle Creek near Findlay	46.5	1947-57	June 7, 1947	13.38	2,920	Feb. 10	-------	6,300	------	2.86
172	Blanchard River near Findlay	343	1923-35,	Dec. 1, 1927	15.4	11,800	Feb. 11	16.76	15,000	43.7	2.73
			1940	March 1913	18.5	22,000					
173	Tiderishi Creek near Jenera	4.51	1947-	Feb. 25, 1956	14.53	348	Feb. 10	15.15	480	106	2.19
174	Blanchard River at Glandorf	643	1921-28,	Feb. 15, 1950	27.0	15,800	Feb. 12	27.9	17,700	27.5	2.49
			1947-51								
175	Roller Creek at Ohio City	4.94	1947-	Mar. 4, 1955	8.65	351	Feb. 10	9.58	890	180	3.74
176	Town Creek near Van Wert	20.4	1945-53	Mar. 21, 1948	9.34	935	Feb. 10	11.77	2,350	115	-----
177	Auglaize River near Lefiance	2,329	1915-	Feb. 16, 1950	26.4	52,500	Feb. 13	27.65	58,800	25.2	2.18
				March 1913	38.8	120,000					
178	Maumee River near Defiance	5,530	1924-35,	Feb. 16, 1950	13.70	87,100	Feb. 12	12.35	76,500	13.8	1.64
			1939-								
179	Maumee River at Waterville	6,314	1921-35,	Feb. 16, 1950	14.52	94,000	Feb. 12	16.17	85,000	13.5	1.68
			1939-								
180	Portage River at Woodville	433	1928-35,	Feb. 15, 1950	14.51	11,500	Feb. 12	11.81	7,490	17.3	1.19
			1939-	March 1913	17	17,000					
181	Sandusky River near Bucyrus	89.8	1925-35,	Dec. 14, 1927	9.15	5,800	Jan. 22	11.9	13,500	150	5.19
			1938-51	Mar. 23, 1913	14.5	--------					

See footnotes at end of table.

Table 5.--Summary of flood stages and discharges for the floods of January-February 1959--Continued

No.	Stream and place of determination	Drainage area (sq mi)	Period of record	Maximum flood previously known			Maximum during present flood				
				Date	Gage height (feet)	Discharge (cfs)	Date	Gage height (feet)	Discharge		
									Cfs	Cfs per sq mi	Ratio to $Q_{2.33}$
182	Sandusky River at Upper Sandusky--	293	1911-	Mar. 25, 1913	19.0	---------	Jan. 22	18.70	-------	--------	-----
183	Sandusky River near Upper Sandusky	299	1921-35, 1938-	Dec. 15, 1927 June 1937	10.5 14.3	8,900 --------	Jan. 22	15.00	10,000	33.4	2.00
184	St. James Run near Upper Sandusky-	5.35	1947-	June 7, 1947	12.25	356	Jan. 21	12.66	408	76.3	-----
185	Sandusky River near Mexico--------	776	1923-35, 1938-	Mar. 22, 1927 June 1937	19.9 22.5	15,200 19,000	Jan. 23	22.43	18,900	24.4	2.05
186	Sandusky River at Tiffin----------	965	1904-	Mar. 26, 1913	19.4	--------	Jan. 23	9.7	-------	--------	-----
187	Spicer Creek near Tiffin----------	7.09	--------	----------	--------	--------	Jan. 21	-------	1,100	157	-----
188	Havens Creek at Havens------------	5.00	1947-	May 12, 1956	7.66	312	Jan. 21	7.13	Ice	--------	-----
							Feb. 10	6.37	256	51.2	1.44
189	Sandusky River near Fremont-------	1,248	1923-35, 1938-	Jan. 15, 1930	*12.12	27,300	Feb. 10	15.20	28,000	22.4	1.87
190	Sandusky River at Fremont---------	1,351	1904-	Mar. 26, 1913	21.5	--------	Feb. 11	18.0	-------	--------	-----
191	Norwalk Creek near Norwalk--------	4.18	1947-	May 12, 1956	14.37	1,060	Jan. 21	13.96	646	155	1.70
192	East Branch Huron River near Norwalk.	84.9	1924-35	Feb. 26, 1929	9.5	4,700	Jan. 21	12.3	-------	--------	-----
193	Huron River at Milan--------------	363	1950-	May 12, 1956	21.10	18,200	Jan. 22	24.08	25,800	71.1	-----
194	Vermilion River near Vermilion----	260	1950-	Jan. 26, 1952	11.5	9,820	Jan. 21	13.80	20,500	78.8	-----
195	East Branch Black River at Elyria-	211	1922-35	Mar. 14, 1933	10.10	11,400	Jan. 21	14.7	-------	--------	-----
196	Plum Creek at Oberlin-------------	4.88	1947-	June 2, 1947	14.69	658	Jan. 21-22	16.13	990	203	2.41
197	Black River at Elyria-------------	392	1944-	May 13, 1956	18.02	14,900	Jan. 22	22.9	24,000	61.2	2.73
198	Rocky River near Berea------------	269	1923-35, 1943-	Jan. 19, 1929 March 1913	11.0 20.9	16,600 --------	Jan. 22	14.10	21,400	79.6	2.10
199	Cuyahoga River at Hiram Rapids----	147	1927-35, 1944-	Mar. 23, 1948	7.00	2,760	Jan. 23	8.11	3,670	25.0	2.53
200	Cuyahoga River at Old Portage-----	405	1921-35, 1939-	Jan. 26, 1952	10.42	[b]4,540	Jan. 21	11.54	[b]6,500	16.0	[b]2.24
201	Cuyahoga River at Independence----	709	1921-23, 1927-35, 1940-	Oct. 16, 1954	20.04	[b]14,300	Jan. 22	22.41	[b]24,800	35.0	[b]2.90
202	Big Creek at Cleveland Zoo, Cleveland.	37.5	--------	March 1948	--------	5,900	Jan. 22	-------	6,000	160	-----
203	Chagrin River at Willoughby-------	251	1925-35, 1939-	Mar. 22, 1948 Mar. 23, 1913	17.95 17.3	28,000 20,000	Jan. 21	16.73	22,000	87.6	2.39
204	Phelps Creek near Windsor---------	26.4	1942-	Mar. 22, 1948	8.97	3,840	Jan. 21	9.34	4,600	174	3.33
205	Hoskins Creek at Hartsgrove-------	6.94	1947-	March 1948	14.53	543	Jan. 21	14.55	552	79.5	2.08
206	Mill Creek near Jefferson---------	78.3	1942-	Mar. 22, 1948	9.95	7,010	Jan. 22	12.50	9,810	125	2.93
207	Grand River near Madison----------	587	1922-35, 1938-	Mar. 22, 1948	12.48	16,600	Jan. 22	14.73	21,100	35.9	2.43
208	Ashtabula River near Ashtabula----	118	1924-35, 1939-47, 1950-	May 16, 1942	9.67	10,800	Jan. 22	11.03	11,600	98.3	2.27
209	Conneaut Creek at Amboy-----------	178	1922-35, 1950-	Oct. 16, 1954	*12.94	12,900	Jan. 22	11.70	17,000	95.5	2.66

* Occurred at different time than maximum discharge. a Contents in acre-ft. b Affected by regulation.

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